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IBM System/38 Query Utility Reference Manual and User's Guide

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This is a major revision of, and obsoletes, SC21-7724-4 and Technical Newsletter SN09-1517. This edition applies to release 4, modification 1 of the IBM System/38 Interactive Data Base Utilities Licensed Program (Program 5714-UT1), and to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters. Because the changes and additions are extensive, this publication should be reviewed in its entirety. See *About This Manual* for a summary of the major changes. Changes are periodically made to the information herein; these changes will be reported in technical newsletters or in new editions of this publication.

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PURPOSE OF THIS MANUAL

The query utility is part of the IBM System/38 Interactive Data Base Utilities (IDU) Licensed Program, Program 5714-UT1. This manual describes query for users who want to analyze information selected from their System/38 data base. The manual introduces the purpose, functions, and organization of query and describes:

- How to create a query application
- How to request query in order to define, change, execute, delete, or manage query applications
- How to use the function control keys and the command function keys available to query users

This manual is intended for System/38 work station users, account programmers, and IBM field support personnel.

ORGANIZATION OF THIS MANUAL

This manual contains 11 chapters, which are supplemented by two appendixes.

- Chapter 1 presents an overview of what query applications can do and how the query utility works.
- Chapter 2 describes how to request query and how to use the query menu.
- Chapter 3 is a guide to designing query applications, and includes examples of how to create the kinds of reports query can provide.

- Chapter 4 describes the function control keys and command function keys used with query.
- Chapter 5 describes how to use the menus and prompts to define and create or change a query application.
- Chapter 6 describes how to delete a query application.
- Chapter 7 shows how to execute a query application.
- Chapter 8 describes how to manage a query application.
- Chapter 9 discusses additional topics, such as design considerations and security.
- Chapter 10 describes query commands.
- Chapter 11 discusses query source statements.
- Chapter 12 describes query problem determination procedures.
- Appendix A contains the DDS for the sample file that was shipped with the utility.
- Appendix B provides service information.
- The glossary defines terms and acronyms used in this manual.

SUMMARY OF CHANGES

This manual reflects the following changes made to the utility for release 4, modification 1.

- The addition of option 5, Display status of queries submitted, to the query create/change menu.
- The renaming of the query execution status display to the query creation/execution status display.
- The renaming of status values on the query creation/execution status display and the query activity log.
- The addition of option 6, Create application in batch, on the exit application definition menu.
- The renaming of option 5, Create application, on the exit application definition menu to Create application interactively.
- The addition of Execution following creation on the application creation prompt.
- The renaming of the query job selection description selection list to the job description selection list.
- The removal of the library qualifier for the SRCFILE parameter of the CRTQRYAPP command if *SAVDFN is specified for SRCFILE.

WHAT YOU SHOULD KNOW

To use this manual effectively, you must know how to use the following parts of the *IBM 5251 Display Station, Model 11 or 12*:

- Work station controls and indicators
- Work station keys
 - Cursor movement keys
 - Command function keys
 - Field exit keys
 - Error Reset key

This information is contained in *IBM 5251 Display Station Models 1 and 11, IBM 5252 Dual Display Station Operator's Guide, GA21-9248* (directly attached work stations) or in *IBM 5251 Display Station Models 2 and 12 Operator's Guide, GA21-9323* (remote display station/control units).

You should also know how to use the 5251 Display Station as a work station with CPF by doing the following:

- Basic work station operation
- Work station sign-on and sign-off
- Message handling
- General work station problem determination

This information is contained in *IBM System/38 Programmer's/User's Work Station Guide, SC21-7744*.

Additionally, you should be familiar with the following concepts:

- Data description specifications (DDS)—Query applications can refer only to files that have been described by data description specifications.
- Control program facility (CPF) spooling support—Reports created by a query application are printed or displayed by CPF spooling support.

This information is contained in the *IBM System/38 Control Program Facility Concepts Manual, GC21-7729*.

Note: This publication follows the convention that he means he or she.

IF YOU NEED MORE INFORMATION

You may need to refer to another IBM publication for a specific type of information.

CPF Commands and Functions

- *IBM System/38 Control Language Reference Manual, SC21-7731*
 - Control language syntax and syntax diagrams
 - All control language commands and their parameters
 - Command authorization by user profile
- *IBM System/38 Control Program Facility Programmer's Guide, SC21-7730*
 - Using control language commands to perform CPF functions
 - System values
 - IBM-supplied objects
 - Creating a file
 - Testing and debugging

System Information

- *IBM System/38 Programming Reference Summary, SC21-7734*
 - Summary of commands
 - Summary of features for System/38 licensed programs
- *IBM System/38 Guide to Program Product Installation and Device Configuration, GC21-7775*
 - Contains information relating to the installation of the Interactive Data Base Utilities
- *IBM System/38 Problem Determination Guide, SC21-7876*
 - Corrective action for system problems
 - Information for gathering information about problems
- *IBM System/38 Control Program Facility Reference Manual—Data Description Specifications, SC21-7806*
 - Describes entries for data description specifications

Messages

- *IBM System/38 Messages Guide: CPF, RPG III, IDU, SC21-7736*
 - All messages other than COBOL
 - Related message information

Content and Use of System/38 Publications

- *IBM System/38 Guide to Publications, GC21-7726*
 - Contents of System/38 publications
 - Reading sequences for System/38 publications
 - Index entries from frequently used System/38 publications
 - Glossary of terms used in System/38 publications

Operating Aid

- *IBM System/38 Keyboard Template, GX21-7756*
 - Location of command function keys for CPF licensed program
 - Location of command function keys for IDU licensed program



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Query applications generate reports from information in your data base. Because query applications can be created quickly, and because the applications can create a variety of reports, query can help you take continuing advantage of the information in your data base.

- Query makes the information available to you when you need it.
- Query helps you interpret the information when you see it.

Query provides a convenient method of using several query utility functions without requiring the use of the command language commands.

You can use query to:

- Create a new query application interactively or in batch
- Change an existing query application
- Delete a query application
- Execute a query application under various job descriptions
- Inquire about the status of an existing query application that was submitted for creation in batch or execution
- Display, print, or delete output from a query application
- Rename or move an existing query application and change its text description
- Specify who can or cannot use a query application that you have created

You can use query if you are working on a 12, 16, or 24-line display. Do not use query on the system console because various features such as highlighting and reverse image of fields in error are not available at the console. All models of the System/38 support query.

MAKING YOUR INFORMATION AVAILABLE-EXAMPLE

If you have the proper authorization, you can design a query application at a work station and request a report. You must know from which file you want to create the report. You do not need to know the specific contents of the file: query can show you a text description of each record format in the file (the term *file* in this manual also means *file member* unless otherwise noted). You do not need to know a programming language: you can specify the report with the aid of prompts, menus, and help text.

Note: The DSNQRYAPP (Design Query Application) command is used throughout this publication. It is possible that you are authorized to use the function limiting commands CHGQRYDEF (Change Query Definition) and CRTQRYDEF (Create Query Definition) instead of the DSNQRYAPP command. See *Chapter 10* for differences in the prompting sequence when these commands are used.

To request query, enter the DSNQRYAPP (Design Query Application) command on the command entry display, or select option 2 on the programmer menu, and press the Enter/Rec Adv key. Query then displays the query menu.

You can use the query menu to create, change, delete, execute, or manage a query.

If you want to display help text associated with any of these displays, press the Help key. When you are through viewing the help text, press the CF1 key to return to the interrupted display.

QUERY MENU

Select one of the following:

1. Create or change a query
2. Execute queries and display output
3. Manage existing queries

Option: 1

Press HELP for instructions. Press CF1 to exit.

Since you want to create a new query, select option 1 and press the Enter/Rec Adv key. Query then displays the query create/change menu.

You can use the query create/change menu to display detailed information about a query, create a new query, change an existing query, or delete an existing query.

```

                                QUERY CREATE/CHANGE MENU

Select one of the following and enter values below:
  1. Display information about a query
  2. Create a new query
  3. Change an existing query
  4. Delete an existing query

Option:                          2

Query name:                       OPEN      (*-Query selection list)
Library name:                     MYLIB

HELP-Help   CF2-Previous display
```

Since you want to create a new query, select option 2. In this example you have specified:

Query name: OPEN is the name of the query application you are creating.

Library name: MYLIB is the library you want to place the new query in.

Note: MYLIB is a library of your choice. You may create a library named MYLIB or use a library of your own.

If OPEN in library MYLIB already exists, query displays the following message at the bottom of your work station screen:

```
Program OPEN.MYLIB already exists.
```

If this happens, choose another name for your query application or place it in another library. If you are authorized, you could instead delete the existing program.

When you are finished with this display, press the Enter/Rec Adv key. Query displays the query create prompt.

You can use the create prompt to specify information about the new query you are creating. Since you have already specified the name of your query (OPEN), query has filled in the name of your new query on this prompt.

```

                                QUERY CREATE PROMPT
Query name:          OPEN          Library:  MYLIB

Enter information for new query:
Description:  Open order status
File name:   QORDERS  (*-File selection list)
Library name:  _____

HELP-Help  CF2-Previous display  CF3-File information
```

In this example you have specified:

Description: Open order status is the text description you specified for your new query application.

File name: QORDERS is the data base file from which this query will gather information to create a report.

Note: There is an IBM-supplied sample file shipped with query. The file is named QORDERS and is located in library QIDU. DDS for this file is located in Appendix A of this manual.

You have not specified a library for the file, so query will use the library search list (*LIBL) to locate the library the file QORDERS is in.

When you are finished with this display, press the Enter/Rec Adv key. Query displays the output specification prompt on which you can specify headings for your report.

OUTPUT SPECIFICATION PROMPT

Enter the following:

Cover page: _____

Page heading: _____

Detail listing: *YES Detail list double spaced: *NO
Output line width: 132 Separate record format headings: *YES
Record sampling: *NO
File review: *YES Display all fields in prompt: *YES

Take defaults for all selected fields: *NO

Key in a title and specify a page heading as follows:

OUTPUT SPECIFICATION PROMPT

Enter the following:

Cover page: Customer order file: Order status as of Jan 31, 1979

Page heading: Open Order Status

Detail listing: *YES Detail list double spaced: *NO
Output line width: 132 Separate record format headings: *YES
Record sampling: *NO
File review: *YES Display all fields in prompt: *YES

Take defaults for all selected fields: *NO

Press the Enter/Rec Adv key. Query displays the file review prompt for the file QORDERS. To review the fields contained in order header records, you key in R before ORDHDR:

FILE REVIEW PROMPT FOR FILE QORDERS

For each record format to be used, enter R to review the fields, A to select all fields, or E to enter the fields later:

RECORD FMT	DESCRIPTION
R ORDHDR	Order file header record

When you press the Enter/Rec Adv key, query begins to display a description of each field in the order header records. The fields are described on a field review prompt:

FIELD REVIEW PROMPT FOR RECORD ORDHDR

Place an X next to each field to be used or enter *ALL: _____

X	FIELD NAME	LENGTH	TYPE	DESCRIPTION
-	K CUST	5	A	Customer number
-	K ORDER	5,0	P	Order number
-	ORDDAT	6,0	P	Date order was entered
-	CUSORD	15	A	Customer purchase order number
-	SHPVIA	15	A	Shipping instructions
-	ORDSTS	1,0	P	Order status
-	OPRNAM	10	A	Operator name
-	ORDAMT	8,2	P	Order amount
-	CUSTYP	1,0	P	Customer type: 1=Gov 2=Sch 3=Bus 4=Pvt 5=Oth
-	OPNSTS	1,0	P	Open order status: 1=Open 2=Closed 3=Canceled
-	TOTLIN	3,0	P	Total items in order
-	INVNUM	5,0	P	Invoice number
-	PRTDAT	6,0	P	Date order was printed
-	ACTMTH	2,0	P	Accounting month of sale
-	ACTYR	2,0	P	Accounting year of sale
-	STATE	2	A	State abbreviation

You decide that of the fields shown, the only ones you need to list are CUST, ORDER, ORDAT, ORDAMT, and OPNSTS. You key in X before those field names.

FIELD REVIEW PROMPT FOR RECORD ORDHDR

Place an X next to each field to be used or enter *ALL: _____

X	FIELD NAME	LENGTH	TYPE	DESCRIPTION
X K	CUST	5	A	Customer number
X K	ORDER	5,0	P	Order number
X	ORDDAT	6,0	P	Date order was entered
-	CUSORD	15	A	Customer purchase order number
-	SHPVIA	15	A	Shipping instructions
-	ORDSTS	1,0	P	Order status
-	OPRNAM	10	A	Operator name
X	ORDAMT	8,2	P	Order amount
-	CUSTYP	1,0	P	Customer type: 1=Gov 2=Sch 3=Bus 4=Pvt 5=Oth
X	OPNSTS	1,0	P	Open order status: 1=Open 2=Closed 3=Canceled
-	TOTLIN	3,0	P	Total items in order
-	INVNUM	5,0	P	Invoice number
-	PRTDAT	6,0	P	Date order was printed
-	ACTMTH	2,0	P	Accounting month of sale
-	ACTYR	2,0	P	Accounting year of sale
-	STATE	2	A	State abbreviation

In this example, you do not want to alter the defined record order for your report or to specify additional sorting options or sort fields, so you press the Enter/Rec Adv key.

Query displays the exit application definition menu.

EXIT APPLICATION DEFINITION MENU

Select one of the following:

1. Restart definition
2. Modify definition
3. Delete definition
4. Save definition
5. Create application interactively
6. Create application in batch

Option: 6

Accept the default of 6 and press the Enter/Rec Adv key.

Because you accepted option 6, Create application in batch, from the exit application definition menu, the application creation prompt is then displayed.

```
APPLICATION CREATION PROMPT

Enter the following:
Application name:          OPEN
Library name:             MYLIB
Public authority:         1 (1-Normal 2-None 3-All)
Adopt owner's user profile: N (Y-Yes N-No)
Source listing:           N (Y-Yes N-No)
Dump internal data areas: N (Y-Yes N-No)
Generate code listing:    N (Y-Yes N-No)

Job description name:     * _____ (*-Job description list)
Library name:             _____

Execution following creation: Y (Y-Yes N-No)
```

In this example you have specified:

Application name: The name of your application is OPEN. Although query has already filled in this name, you may change it.

Library name: The application is stored in the library named MYLIB. Although query has already filled in this name, you may change it.

Public authority: You accept the default of 1 (Normal), which specifies that all system users can execute the defined application, but all users cannot change or delete the application.

Adopt owner's user profile: You accept the default of No, which specifies that you want to create this application to execute under the user profile of the person executing it, and not your own.

This application will execute under the authority restrictions of the person executing it, and not of the person who created it. Additionally, you are the only person authorized to change or delete this application.

Source listing : You accept the default of No, which specifies that you do not want to print the utility definition specifications (UDS) for this application.

Dump internal data areas: You accept the default of No, which specifies that you do not want to print the application program template.

Generated code listing: You accept the default of No, which specifies that you do not want to print an internal representation of the program listing for this application.

Job description name: If a job has not been submitted to create and/or execute a query application before, query displays an asterisk (*). If query has filled in the name of a job description, change it to an asterisk.

Library name: Query fills in the name of the library containing the job description last used to submit a job to create and/or execute a query application with your user profile. If no job has been previously submitted, query leaves this field blank and uses the library list. If query has filled in a name, change it to a blank field.

Execution follows creation: You accept the default of Yes, which specifies that execution of this query application will occur automatically following its creation.

This ends the application definition prompting sequence. Press the Enter/Rec Adv key.

Query displays the following message at the bottom of your work station screen:

List being constructed.

Query displays the job description selection list.

JOB DESCRIPTION SELECTION LIST		
NAME	LIBRARY	DESCRIPTION
<u>1</u> QIDUJOB1	QIDU	Normal priority
_ QIDUJOB2	QIDU	Low priority

1-Select 2-Display job description CF2-Previous display

Select QIDUJOB1 (an IBM-supplied job description) by placing a 1 in front of it. Press the Enter/Rec Adv key.

Query then displays the query execution prompt.

```

                                QUERY EXECUTION PROMPT
Query name:      OPEN           Library:      MYLIB
File name:      QORDERS

Enter information below for execution:
Data base file member:      _____  (*-List Blank-First member)
Number of records to query:  _____  (Blank-All records)
Forms width:                132         (50 to 198)
Hold output for display:    Y           (Y-Yes N-No)
Job description:           QIDUJOB01
Library name:              QIDU

HELP-Help  CF2-Previous display
```

In this example you have specified:

Data base file member: The name of the file member that you want to query. If you leave this blank, query operates against the first file member.

Number of records to query: This is the number of records that you want to query. Specify a number between 1 and 999999. If you leave this blank, query uses all the records in the file.

Forms width: You accepted the default of 132 positions.

Hold output for display: You changed the default of No to Yes. This specifies that you want the output of your query report held so you can view it later.

Job description: Query displays the name of the job description you selected from the job description selection list. You cannot change this field on the query execution prompt.

Library name: Query displays the name of the library that contains the job description you selected from the job select list. You cannot change this field on the query execution prompt.

When you are finished with the query execution prompt, press the Enter/Rec Adv key. Query submits a batch job to create and execute the query application.

Query then:

- Displays a message at the bottom of the query execution prompt:

Query application definition being saved.

- Returns you to the query create/change menu and displays a message at the bottom of the menu:

Application definition saved in program OPEN.MYLIB.

Press the roll up key to display a second message:

Job OPEN.user name.job# submitted for query OPEN.MYLIB.

Your work station will receive a message when your batch job has completed execution. Press the CF6 key to view the message. Press the CF8 key to remove messages and return to the query create/change menu.

Note: Because you chose option 6, Create application in batch, on the exit application definition menu, you can continue to operate your work station while query creates and executes your application.

Press the CF2 key to return to the query menu.

```
                                QUERY MENU

Select one of the following:
  1. Create or change a query
  2. Execute queries and display output
  3. Manage existing queries

Option:  2

Press HELP for instructions.  Press CF1 to exit.
```

Select option 2 from the query menu and query will display the query execution and report menu.

Select option 4 from the query execution and report menu to display the output from your query application.

```

                                QUERY EXECUTION AND REPORT MENU

Select one of the following and enter values below:
  1. Display information about a query
  2. Submit a query for execution
  3. Display status of queries submitted
  4. Display output at work station from last execution

Option:                4

Query name:            OPEN      (*-Query selection list)
Library name:          MYLIB

HELP-Help  CF2-Previous display
```

You can use the Roll keys to view your report. When you have finished viewing your report, press the Enter/Rec Adv key and query will display the query output menu.

Select option 2 on this menu to release the query output for printing.

QUERY OUTPUT MENU

Select one of the following:

1. Hold the output for later display or printing
2. Release the output for printing
3. Delete the output

Option: 2

HELP-Help CF2-Previous display

Query automatically adds date (shown in the format of the system date), time, page numbers, and column headings to the report. The report is printed in the following format. The asterisk (*) to the right of the value at the bottom of the ORDER AMOUNT column indicates that the value is the total order amount.

07/21/81 08:29:37		Open Order Status			PAGE 1
CUSTOMER NUMBER	ORDER NUMBER	ORDER DATE	ORDER AMOUNT	OPEN STATUS	
00001	72	79/01/18	510.68	9	
00001	106	79/02/03	26.32	9	
00001	123	73/02/09	519.79	9	
00001	235	78/03/16	460.48	9	
00001	387	78/03/16	749.25	9	
00150	995	79/12/08	133.54	9	
00150	1,129	78/12/27	193.13	9	
		79/02/25	589.05	7	
			1,157,379.19 *		
TOTAL NUMBER OF RECORDS PROCESSED 1142					

The data appears in this form because edit code Y is specified in DDS.

INTERPRETING YOUR INFORMATION

The query options allow you to examine the same information from different points of view. By creating different kinds of reports from the same information, you can discover new ways to interpret the information.

For example, from one order file, query could produce reports to show the following:

- A list of the orders a customer placed last month
- Total value of orders received last month from new accounts
- Number of overdue accounts in each category of credit ratings, listed in ascending order by due date
- Geographic location or territory that produced the most orders in the last 6 months
- Geographic location or territory that produced the highest total value of orders in the last 6 months
- Total value of orders received last year from each customer type (such as private customers and government accounts)

So that the format of each report reflects the purpose of the report, you could specify:

- A title
- Page headings
- Column headings
- Field editing (such as insertion of decimal points and suppression of leading 0's)
- Spacing between columns
- The left-to-right sequence of columns
- Page limits

The kinds of reports that query applications can generate are summarized in the following paragraphs. Examples are shown in Chapter 3.

Kinds of Reports

Query applications can provide:

- Detail reports to show the information contained in each record of a file
- Summary reports to show field totals or field averages for records in a file
- Combinations of detail and summary reports

Selections and Sampling

Query can perform record selection to provide the following:

- Reports to show only selected records, such as records in which the value of a field is equal to a specified value. The values can be constants, the contents of fields within a record format, or computed result fields.
- Reports to show a sample of the records in a file, such as the first 200 records in a file, or every tenth record in a file.

Sorting

Query can provide sorted reports as follows:

- Reports to show records after they are sorted into a special order according to the value of existing fields or the value of computed result fields.
- Sorted reports to show subtotals for particular fields.

Computations

Query automatically counts the records selected for a report. Query can also perform the following computations for a report:

- Sum the value of fields to find totals and subtotals.
- Determine the average value a field has in the set of records processed for the report.
- Multiply, divide, add, or subtract values, or extract a remainder from a value. The values can be numeric constants, the contents of fields within a record format, or computed result fields. For example, a report that lists the value of orders received could also list the sales commissions due: you could specify that query multiply the order amount by a fixed percentage to determine commissions. Query would display the commissions as part of the report.

Tables

Query applications can compose tables. The tables can help you analyze a file for patterns, trends, and exceptions.

A table is a summary report that classifies records in a file according to the values of one or two selected fields. For example, a table could classify the contents of an order file according to the value of orders received: all orders for less than \$500 could be one class, all orders in the range \$500 to \$999 could be another class, and all orders including and above \$1000 could be the remaining class.

After grouping the records in a file into classes, query computes specified counts, sums, and averages from the records in each class. Then, after all records in each class are processed, query composes a table from the results. The table portrays the relationships of the different classes formed from the file.

Suppose you want to know the distribution of orders from selected midwestern states. Query could supply the information in a table like the following:

STATE	COUNT OF RECORDS	RANK BY COUNT OF RECORDS	AVERAGE OF ORDER AMOUNT	RANK BY AVERAGE OF ORDER AMOUNT
MN	26	3	384.21	2
ND	43	1	381.93	3
SD	21	4	350.27	4
WI	32	2	402.15	1
TOTAL NUMBER OF RECORDS PROCESSED			382.27*	122

- 1 Each record in the order file represents one order. Each record contains the field STATE to identify the customer's residence. You specify that query select only those records in which STATE is MN, ND, SD, or WI. Then you define a table in which STATE is used to classify the selected records. The four selected values of STATE become four record classes. In each of the four classes, all order records are combined to create one horizontal row in the table.
- 2 As you define the table to query, you request a count of the records contained in each class. The record counts become part of your table. A total record count is also displayed. The total count is marked by an asterisk (*).
- 3 You specify that query rank each class by the record count for the class, with 1 being the highest rank.
- 4 For each state, you want to compare the value of orders received to the quantity of orders. Therefore, you request that query (1) compute the average value of the orders received from each state, and (2) rank the states by average order amounts, with 1 being the highest rank. Query automatically computes and displays the total average for the four states. The total average for order amounts is computed from all of the records selected for the table. The total average is marked by an asterisk (*).
- 5 Query automatically computes the total number of records that were processed to create your report.

Two fields can be used to classify records for one table. One field is used to define major classes down the page, and the other is used to define minor classes across the page.

For example, suppose you want to analyze customer orders according to the value of the orders. You could define a table in which major classes are formed according to order amounts. And suppose you also want to examine, within each class formed by order amounts, the number and value of orders submitted by different customer types. You could specify that minor classes for the table be based on customer type. An example of such a table follows:

ORDER AMOUNT		CUSTOMER TYPE 1		CUSTOMER TYPE 2		CUSTOMER TYPE 3			
		AVERAGE OF COUNT OF RECORDS		AVERAGE OF ORDER AMOUNT		AVERAGE OF COUNT OF RECORDS		AVERAGE OF ORDER AMOUNT	
GE .00	LT 500.00	30	419.82	12	164.15	61	393.26		
GE 500.00	LT 1,000.00	75	715.26	38	747.79	155	801.92		
GE 1,000.00	LT 1,500.00	123	1,204.46	27	1,148.73	308	1,215.37		
GE 1,500.00	LT 2,000.00	61	1,615.71	6	1,701.54	197	1,652.43		
GE 2,000.00		6	2,296.15	0	0.00	43	2,301.17		
TOTAL NUMBER OF RECORDS PROCESSED		1142							

Diagram labels: 1 points to the ORDER AMOUNT column headers; 2 points to the CUSTOMER TYPE column headers; 3 points to the COUNT OF RECORDS column headers.

- 1 ORDER AMOUNT is the major class field. It defines five major classes in this table. Each major class becomes a horizontal row in the table.
- 2 CUSTOMER TYPE is the minor class field. It defines three minor classes in this table. Each minor class becomes a set of vertical columns in the table. Note that within each major class, query performs computations for each minor class.
- 3 Query automatically computes the total number of records that were processed to create your report.

Examples of how to define tables are shown in Chapter 3.

HOW QUERY WORKS

Query creates reports from data that exists in data base files. Although query requires access to a data base file in order to create a report from data in the file, query never alters the contents of a file.

The creation of a query report requires three steps.

1. **Design the Application:** Design the query application that is to create the report. You can design an application in one of two ways:
 - a. Enter the DSNQRYAPP (Design Query Application) command, or select option 2 from the programmer menu, and respond to the query prompts.
 - b. Code UDS statements and enter them into a source file as you would enter any other kind of source statement.
2. **Create the Application:** Create an executable application from the designed query application. You can create an application in one of two ways:
 - a. Choose option 5, Create application interactively, or option 6, Create application in batch, on the exit application definition menu. An exit application definition menu appears after you enter the DSNQRYAPP command in step 1 and respond to the prompts.
 - b. Enter the CRTQRYAPP (Create Query Application) command to create an application from utility definition specifications (UDS) that were coded and saved previously.
3. **Execute the application:** Execute a created application. You can execute a query application in one of two ways:
 - a. Enter the DSNQRYAPP (Design Query Application) command and respond to the query prompts.
 - b. Enter the QRYDTA command on the command entry display and specify the parameters associated with the command.

Note: The DSNQRYAPP (Design Query Application) command is used throughout this publication. It is possible that you are authorized to use the function limiting commands CHGQRYDEF (Change Query Definition) and CRTQRYDEF (Create Query Definition) instead of the DSNQRYAPP command. See *Chapter 10* for differences in the prompting sequence when these commands are used.

QUERY OR A PROGRAMMING LANGUAGE

If a programming language such as RPG or COBOL is available at your installation, the first question to answer when you consider how to create a report is: can the report be created and maintained more efficiently by query or by a program? The following guidelines should help you answer the question.

A programming language should be considered for coding reports that:

- Require precise formatting of items such as title pages, page headings, column labels and spacing, and page numbers
- Will be printed on preprinted forms
- Require processing of many different record formats or different files
- Require complex logic or complex calculations that are beyond the capabilities of query

Query should be considered for reports that:

- Do not require precise formatting of title pages, page headings, column labels, and so on in order to be useful
- Are requested infrequently in order to answer specific questions
- May be modified often in response to changing circumstances
- Must be created quickly

You may, however, decide to use both query and a programming language: you can use query to test the usability of a report, then model a program after the report.



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Chapter 2. How to Request and Use Query

To request query you must first sign on at a work station by responding to the sign-on prompt. The display you see after entering your password depends on your authorization to use the work station and on data processing procedures at your installation. Some users may request query by using the command entry display while others may request query with the programmer menu. System/38 also permits programmers to design different menus for different users.

DSNQRYAPP (Design Query Application) Command

Use the Design Query Application command, or select option 2 from the programmer menu, to request the query menu.

To use the DSNQRYAPP command, you must be authorized to use it.

Note: The DSNQRYAPP (Design Query Application) command is used throughout this publication. It is possible that you are authorized to use the function limiting commands CHGQRYDEF (Change Query Definition) and CRTQRYDEF (Create Query Definition) instead of the DSNQRYAPP command. See *Chapter 10* for differences in the prompting sequence when these commands are used.

Query Menu

The query menu is the first query display. You can use this menu to select a function that will create, change, delete, execute, or manage a query application. Query then presents a series of displays to complete the function you selected.

QUERY MENU

Select one of the following:

1. Create or change a query
2. Execute queries and display output
3. Manage existing queries

Option: _

Press HELP for instructions. Press CF1 to exit.

The options are:

1. *Create or change a query*: This option displays the query create/change menu on which you can create new queries, change existing ones, or display detailed information about a query. Additionally, you can delete a query or display the status of queries submitted by selecting this option. Refer to Chapter 5 for a description of creating or changing a query, or refer to Chapter 6 for a description of deleting a query.

2. *Execute queries and display output*: This option displays the query execution and report menu on which you can select and execute queries or display output from any query that has already been executed, or display detailed information about a query. Refer to Chapter 7 for a description of this option.

3. *Manage existing queries*: This option displays the query management menu on which you can select such functions as displaying detailed information about a query; changing the name, library, or description of a query; authorizing a query for another user; or changing the ownership of a query application. Refer to Chapter 8 for a description of this option.

Press the Help key to view help text available with this menu, and then press the CF1 key to return to the interrupted menu.

Press the CF1 or CF2 key to exit from query.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

HELP TEXT

You can display help text from any of the query displays. The help text lists:

- The command function keys that can be used with the current display.
- The values or descriptions of the input fields of the current display.
- Operational notes such as the position of the current display in relation to the other query prompts.

When you are through viewing the help text, press the CF1 key to return to the interrupted display.

USING THE QUERY COMMAND FUNCTION (CF) KEYS

Several command function keys are available to you while you are using query. The definition command function keys are identified by a keyboard template and are described in Chapter 4. Additionally, other query command function keys are identified at the bottom of the specific query display and the help text for that display. A description of these command function keys is included with the description of the display they support.

USING SELECTION LISTS

Query recognizes a set of characters that ends with an asterisk (*) as a generic name. An example is ORD*. The most general form of a generic name is an asterisk alone. Query displays a selection list for a file, job description, or query application if you specify one or both of:

- A generic name for file name, job description name, or query name.
- *ALL or *ALLUSR for library name.

*ALL includes all libraries in the system.

*ALLUSR includes all user defined libraries and library QGPL.

Query displays a member selection list for a data base file if you specify an asterisk for data base file member.

Query includes a file, job description, or query application on the appropriate selection list only if all of the following conditions are satisfied:

- You have authorization under your user profile to perform the requested operation. Authorization through public authority is not sufficient to have the file or query application appear on the appropriate selection list. Query will include two IBM-supplied job descriptions on the job description selection list based on public authority. These are QIDUJOB1 for normal priority and QIDUJOB2 for low priority. Query displays other job descriptions only if you are explicitly authorized to use them.
- If you specify a generic name, the file name, query application name, or the job description name starts with the same characters that precede the asterisk. If an asterisk alone is specified, then no restrictions are placed on the file name, job description name, or query application name.
- The file, job description, or application is in the library or libraries specified under library name.

Query includes all members of the data base file when you request the selection list by specifying an asterisk for data base file member.

Note: If you specify *LIBL for library name and a nongeneric name for a file, job description, or query application, query selects the first occurrence in your library list. Query does not display a selection list if *LIBL and a nongeneric name are specified.

Chapter 3. How to Create a Query Application: Examples

Query gives you the ability to create different kinds of reports from the same information. So that you create the report that best portrays the information you want, you should become familiar with the effects of the different query options.

This chapter acquaints you with query options by presenting samples of query reports and showing how the reports are created. The samples demonstrate a variety of ways in which you can focus information and gather statistics by using query.

For a detailed description of interactive query design, see Chapter 5. For a detailed description of how to execute query applications, see Chapter 7.

Note: The *IBM System/38 Application Example 1* manual also contains an example of using query to produce reports.

ASSUMPTIONS

The examples in this chapter reflect the following assumptions about creating a query, sign-on, and file content.

Creating a Query Application

You have decided to create a query application by using the DSNQRYAPP (Design Query Application) command. That is, you want query to prompt you for information about the report.

Note: The DSNQRYAPP (Design Query Application) command is used throughout this publication. It is possible that you are authorized to use the function limiting commands CHGQRYDEF (Change Query Definition) and CRTQRYDEF (Create Query Definition) instead of the DSNQRYAPP command. See *Chapter 10* for differences in the prompting sequence when these commands are used.

Sign-On

You have the authority to create and execute your query application. You have signed on at a work station, and have entered the DSNQRYAPP command to request query.

File Content

The information for your report is in a customer order file named QORDERS. QORDERS has one record format. The name of the format is ORDHDR (order header). Each record in the file represents one customer order. There may be many records for a single customer.

The file QORDERS has been defined to CPF by data description specifications (DDS). The file has a keyed sequence access path: ORDHDR records are accessed in the file according to customer number and order number. For a description of DDS and access paths, see the *CPF Reference Manual—DDS*.

Note: DDS defining the file is shown in Appendix A. The example file (QORDERS) shipped with query resides in QIDU and you are authorized to use it.

If there is no data in this file; you can issue the command CALL QWUXXORD.QIDU to place data into this file for use in the examples.

A description of the ORDHDR records is as follows:

Field Name	Length	Edit Code ¹	Column Heading ²	Text Description
CUST ³	5		CUSTOMER NUMBER	Customer number
ORDER ³	5,0		ORDER NUMBER	Order number
ORDDAT	6,0	Y	ORDER DATE	Date order was entered
CUSORD	15		CUSTOMER P.O. #	Customer purchase order number
SHPVIA	15		SHIPPING INSTRUCTIONS	Shipping instructions
ORDSTS	1,0		ORDER STATUS	Order status
OPRNAM	10		OPERATOR NAME	Operator name
ORDAMT	8,2	J	ORDER AMOUNT	Order amount
CUSTYP	1,0		CUSTOMER TYPE	Customer type: 1 = Gov, 2 = Sch, 3 = Bus, 4 = Pvt, 5 = Oth
OPNSTS	1,0		OPEN STATUS	Open order status: 1 = Open 2 = Closed 3 = Canceled
TOTLIN	3,0		TOTAL LINES	Total items in order
INVNUM	5,0		INVOICE NUMBER	Invoice number
PRTDAT	6,0	Y	PRINTED DATE	Date order was printed
ACTMTH	2,0		ACCTG MTH	Accounting month of sale
ACTYR	2,0		ACCTG YEAR	Accounting year of sale
STATE	2		STATE	State abbreviation

¹Edit codes are described under *Extended List Prompt* in Chapter 5.

²Column headings can be in uppercase and lowercase. However, if the print belt available has only uppercase, and the print image specified for the printer file translates lowercase to uppercase, then headings are printed in all uppercase. The print image is specified in the CRTPRTF (Create Printer File) command, which is described in the *CL Reference Manual*.

³CUST and ORDER are key fields.

BEGINNING THE QUERY DEFINITION

Initial prompts that are common to all the sample queries are described here.

To request query, enter the DSNQRYAPP command on the command entry display, or select option 2 from the programmer menu. Query then displays the query menu.

You can use the query menu to select a function so you can create or change a query, delete a query, execute a query, or manage a query.

```

                                QUERY MENU

Select one of the following:
  1. Create or change a query
  2. Execute queries and display output
  3. Manage existing queries

Option:  1

Press HELP for instructions.  Press CF1 to exit.
```

Because you want to create a new query, select option 1 and press the Enter/Rec Adv key. Query then displays the query create/change menu.

You can use the query create/change menu to display detailed information about a query, create a new query, change an existing query, delete an existing query, or display the status of queries submitted.

Because you want to create a new query, select option 2.

```

                                QUERY CREATE/CHANGE MENU

Select one of the following and enter values below:
  1. Display information about a query
  2. Create a new query
  3. Change an existing query
  4. Delete an existing query
  5. Display status of queries submitted

Option:                2

Query name:            ORDERS      (*-Query selection list)
Library name:         MYLIB

```

HELP-Help CF2-Previous display

In this example you have specified:

Query name: ORDERS is the name of the query application you are creating.

Library name: MYLIB is the name of the library you want to place the new query in.

When you are finished with this display, press the Enter/Rec Adv key. Query then displays the query create prompt.

You can use the query create prompt to specify information about the new query you are creating. Query has filled in the name and library of your new query since you have already specified them on the query create/change menu.

```

                                QUERY CREATE PROMPT
Query name:          ORDERS          Library:  MYLIB

Enter information for new query:
Description:      Order status
File name:       QORDERS  (*-File selection list)
Library name:    QIDU

HELP-Help  CF2-Previous display  CF3-File information
```

In this example you have specified:

Description: Order status is the text description of your new query application.

File name: QORDERS is the data base file from which this query will gather information to create a report.

Library name: QIDU is the library the data base file is located in.

When you are finished with this display, press the Enter/Rec Adv key. Query then displays the output specification prompt on which you can specify headings for your report.

You have decided to enter a title and page heading for your report, and you want to review the records in the file:

OUTPUT SPECIFICATION PROMPT

Enter the following:

Cover page: Customer orders

Page heading: Order File Query

Detail listing: *YES Detail list double spaced: *NO
Output line width: 132 Separate record format headings: *YES
Record sampling: *NO
File review: *YES Display all fields in prompt: *YES

Take defaults for all selected fields: *NO

After you press the Enter/Rec Adv key, query displays the file review prompt. Because the customer order file contains only one record format, only one record format is described in the display.

FILE REVIEW PROMPT FOR FILE QORDERS

For each record format to be used, enter R to review the fields, A to select all fields, or E to enter the fields later:

RECORD FMT	DESCRIPTION
R ORDHDR	Order file header record

Key in R before ORDHDR to review the descriptions of fields that are in order header records, then press the Enter/Rec Adv key. Query displays the field review prompt:

FIELD REVIEW PROMPT FOR RECORD ORDHDR

Place an X next to each field to be used or enter *ALL: _____

X	FIELD NAME	LENGTH	TYPE	DESCRIPTION
X	K CUST	5	A	Customer number
X	K ORDER	5,0	P	Order number
-	ORDDAT	6,0	P	Date order was entered
-	CUSORD	15	A	Customer purchase order number
-	SHPVIA	15	A	Shipping instructions
X	ORDSTS	1,0	P	Order status
-	OPRNAM	10	A	Operator name
X	ORDAMT	8,2	P	Order amount
X	CUSTYP	1,0	P	Customer type: 1=Gov 2=Sch 3=Bus 4=Pvt 5=Oth
X	OPNSTS	1,0	P	Open order status: 1=Open 2=Closed 3=Canceled
X	TOTLIN	3,0	P	Total items in order
X	INVNUM	5,0	P	Invoice number
-	PRTDAT	6,0	P	Date order was printed
X	ACTMTH	2,0	P	Accounting month of sale
X	ACTYR	2,0	P	Accounting year of sale
X	STATE	2	A	State abbreviation

Key in an X before the fields you want to use for your report, and press the Enter/Rec Adv key.

Query then displays the query definition prompt so that you can specify processing for your report:

QUERY DEFINITION PROMPT							
For record format name	ORDHDR	enter:					
FIELD NAME	ORDER	SUM	AVG	SORT	TEST	XLIST	TABLE
<u>CUST</u>	<u>1.0</u>	-	-	-	-	-	-
<u>ORDER</u>	<u>2.0</u>	-	-	-	-	-	-
<u>ORDSTS</u>	<u>3.0</u>	-	-	-	-	-	-
<u>ORDAMT</u>	<u>4.0</u>	-	-	-	-	-	-
<u>CUSTYP</u>	<u>5.0</u>	-	-	-	-	-	-
<u>OPNSTS</u>	<u>6.0</u>	-	-	-	-	-	-
<u>TOTLIN</u>	<u>7.0</u>	-	-	-	-	-	-
<u>INVNUM</u>	<u>8.0</u>	-	-	-	-	-	-
<u>ACTMTH</u>	<u>9.0</u>	-	-	-	-	-	-
<u>ACTYR</u>	<u>10.0</u>	-	-	-	-	-	-
<u>STATE</u>	<u>11.0</u>	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-

Notice that the plus sign (+) appears in the lower right corner of the prompt. The plus sign indicates that the query definition prompt can still be contained in another display: you can key in field names and other specifications on all blank lines on the display, and then you can press the Roll ↑ (Roll Up) key to add even more field names on another display of the query definition prompt.

Each example that follows in this chapter explains the report to be created and continues with a display of the query definition prompt.

EXAMPLE 1: DETAIL LIST

A detail list shows one line of information for each record selected for the list. Use this example as a model if you want a simple detail list that:

- 1 Shows each field you select on the field review prompt(s)
- 2 Shows fields in the order defined for the file you are listing from
- 3 Shows column headings that are defined for each field in the file
- 4 Shows each record contained in the record format(s) you select on the file review prompt(s)
- 5 Shows records in the order defined for the file

1
2
3

Date and time are displayed by query.

The page heading is from the output specification prompt.

Pages are numbered by query.

Order File Query											PAGE 1
CUSTOMER NUMBER	ORDER NUMBER	ORDER STATUS	ORDER AMOUNT	CUSTOMER TYPE	OPEN STATUS	TOTAL LINES	INVOICE NUMBER	ACCTG MTH	ACCTG YEAR	STATE	
00001	72	2	610.69	2	9	93	7,440	2	78	WI	
00001	106	2	76.32	2	9	43	9,324	2	78	WI	
00001	123	2	519.79	2				2	78	WI	
00001	235	2	663.79	2					78	WI	
00001	193	2	193.13	2	9	15	34,999	12	79	SD	
00150	1,129	1	549.05	2	7	96	44,100	3	79	SD	

4 5

TOTAL NUMBER OF RECORDS PROCESSED 1162

This total is automatically computed by query.

After you respond to the file and field review prompts as described earlier in this chapter under *Beginning the Query Design*, query displays a query definition prompt.

QUERY DEFINITION PROMPT							
For record format name		ORDHDR	enter:				
FIELD NAME	ORDER	SUM	AVG	SORT	TEST	XLIST	TABLE
<u>CUST</u>	<u>1.0</u>	-	-	-	-	-	-
<u>ORDER</u>	<u>2.0</u>	-	-	-	-	-	-
<u>ORDSTS</u>	<u>3.0</u>	-	-	-	-	-	-
<u>ORDAMT</u>	<u>4.0</u>	-	-	-	-	-	-
<u>CUSTYP</u>	<u>5.0</u>	-	-	-	-	-	-
<u>OPNSTS</u>	<u>6.0</u>	-	-	-	-	-	-
<u>TOTLIN</u>	<u>7.0</u>	-	-	-	-	-	-
<u>INVNUM</u>	<u>8.0</u>	-	-	-	-	-	-
<u>ACTMTH</u>	<u>9.0</u>	-	-	-	-	-	-
<u>ACTYR</u>	<u>10.0</u>	-	-	-	-	-	-
<u>STATE</u>	<u>11.0</u>	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-

The prompt shows the names of fields you selected during field review, and shows them in the order defined for the ORDHDR record format. Unless you change the sequence of numbers in the ORDER column of the prompt, the order in which the fields are shown in the prompt is the order in which they are displayed left to right across a page of your report.

For this example, you do not want to change the order of the fields named in the query definition prompt, and you do not want to specify additional options for the fields.

The blank lines in the prompt indicate that there are no more fields to display. The plus sign (+) in the lower right corner of the prompt indicates that you can continue the prompt in another display for the purpose of adding field names to the prompt. The prompt would be continued if you pressed the Roll ↑ (Roll Up) key.

After you press the Enter/Rec Adv key, query displays the exit application definition menu.

```

                                EXIT APPLICATION DEFINITION MENU

Select one of the following:
  1. Restart definition
  2. Modify definition
  3. Delete definition
  4. Save definition
  5. Create application interactively
  6. Create application in batch

Option:      6

```

Accept option 6 and press the Enter/Rec Adv key.

Because you accepted option 6 from the exit application definition menu, query displays the application creation prompt. Retain all the defaults (including execution following creation) and press the Enter/Rec Adv key.

This is the end of the application definition prompting sequence.

Query then displays the query execution prompt. Query displays the Job description name and Library name specified on the query creation prompt. You cannot change these fields on the query execution prompt. Complete the query execution prompt and press the Enter/Rec Adv key.

Query then submits your job for the creation and execution of the query application ORDERS. Query returns you to the query create/change menu. Query displays a message at the bottom of this display:

```
Application definition saved in program ORDERS.MYLIB.
```

Press the roll up key to display a second message:

```
Job ORDERS.user name.job# submitted for application ORDERS.MYLIB.
```

If you want to check the status of your job, select option 5, Display status of queries submitted, on the query create/change menu. Query displays the query creation/execution status display.

QUERY CREATION/EXECUTION STATUS

APPLICATION	LIBRARY	WHEN SUBMITTED	STATUS
- CHECK01	QGPL	09/23/82 09:06:32	ENDED ABNORMALLY
- MASTER	MYLIB2	09/23/82 09:22:04	COMPLETE
- NAMES	MYLIB2	09/23/82 09:25:54	ACTIVE
ORDERS	MYLIB	09/23/82 09:33:12	QUEUED

1-Job information CF5-Redisplay CF12-Group by status

Query displays applications in the order they were submitted. You can:

- Key in a 1 before an application name and press the Enter/Rec Adv key to display information about the job that was submitted for that application.
- Press the CF12 key to reorder the display to group applications by job status.
- Press the CF5 key to view an updated display.
- Press the CF1 key to return to the query menu.
- Press the CF2 key to return to the query create/change menu.

Query notifies your work station when your job has completed execution by setting on the message waiting indicator and activating the buzzer. Press the CF6 key to display this message.

At the query create/change menu, you can:

- Press the CF2 key to return to the query menu.
- Start defining another query application.

EXAMPLE 2: DETAIL LIST WITH SELECT

Use this example as a model if you want a detail list that:

- 1 Shows only some of the fields you select on the field review prompt(s)
- 2 Shows fields in an order that is different from the order defined for the file you are listing from
- 3 Shows column headings that are defined for the file
- 4 Shows only certain records contained in the record format(s) you select on the file review prompt(s)
- 5 Shows records in the order defined for the file

1
2
3

Date and time are displayed by query.

The page heading is from the output specification prompt.

Pages are numbered by query.

Customer Order File									PAGE 1
CUSTOMER TYPE	ACCTG YEAR	ACCTS MTH	CUSTOMER NUMBER	ORDER NUMBER	ORDER AMOUNT	OPEN STATUS	TOTAL LINES	INVOICE NUMBER	
2	78	10	00002	759	564.37	9	84	29,477	
2	79	10	00004	675	12.22	9	16	28,851	
2	79	10	00005			9	91	28,504	
2	78	10				9	60	28,594	
								29,059	
2	78	10	00150	714	632.49	9	92		
2	78	10	00150	777	322.15	9	56		
TOTAL NUMBER OF RECORDS PROCESSED 44									

4 5

This total is automatically computed by query.

After you respond to the various prompts described earlier in this chapter under *Beginning the Query Design*, query displays the query definition prompt.

You want to respond to the query definition prompt so that the report you define:

- Lists only those orders sold to schools (customer type is 2) in October 1978. In other words, you want to see only those ORDHDR records in which:

```
CUSTYP = 2
ACTMTH = 10
ACTYR = 78
```

- Lists only the following fields, and lists them across the report in the following order:

```
CUSTYP, ACTYR, ACTMTH, CUST, ORDER, ORDAMT, TOTLIN, INVNUM
```

Respond to the query definition prompt as shown:

QUERY DEFINITION PROMPT

For record format name **ORDHDR** enter:

FIELD NAME	ORDER	SUM	AVG	SORT	TEST	XLIST	TABLE
<u>CUST</u>	<u>1.0</u>	-	-	-	-	-	-
<u>ORDER</u>	<u>2.0</u>	-	-	-	-	-	-
<u>ORDSTS</u>		-	-	-	-	-	-
<u>ORDAMT</u>	<u>4.0</u>	-	-	-	-	-	-
<u>CUSTYP</u>	<u>.1</u>	-	-	-	X	-	-
<u>OPNSTS</u>		-	-	-	-	-	-
<u>TOTLIN</u>	<u>7.0</u>	-	-	-	-	-	-
<u>INVNUM</u>	<u>8.0</u>	-	-	-	-	-	-
<u>ACTMTH</u>	<u>.3</u>	-	-	-	X	-	-
<u>ACTYR</u>	<u>.2</u>	-	-	-	X	-	-
<u>STATE</u>		-	-	-	-	-	-
_____		-	-	-	-	-	-
_____		-	-	-	-	-	-
_____		-	-	-	-	-	-
_____		-	-	-	-	-	-

You delete or alter the original numbers displayed under ORDER so that only the fields with numbers are listed and the fields are listed in a new order.

You key in X after the fields you want to test. The result of the testing determines whether or not a record is included in your report.

Query then displays the exit application definition menu.

```

                                EXIT APPLICATION DEFINITION MENU

Select one of the following:
  1. Restart definition
  2. Modify definition
  3. Delete definition
  4. Save definition
  5. Create application interactively
  6. Create application in batch

Option:      6

```

Accept option 6 and press the Enter/Rec Adv key.

Query then displays the application creation prompt. Retain all the defaults (including execution following creation) and press the Enter/Rec Adv key. This is the end of the application definition prompting sequence.

Query then displays the query execution prompt. Query displays the Job description name and Library name specified on the query creation prompt. You cannot change these on the query execution prompt. Complete the query execution prompt and press the Enter/Rec Adv key.

Query then submits your job to create and execute the query application ORDERS. Query returns you to the query create/change menu. Query displays a message at the bottom of this display:

Application definition saved in program ORDERS.MYLIB.

Press the Roll Up key to display a second message:

Job ORDERS.user name.job#submitted for application ORDERS.MYLIB.

Query notifies your work station when your job has completed execution by setting on the message waiting indicator and activating the buzzer. Press the CF6 key to display this message.

At the query create/change menu, you can:

- Press the CF2 key to return to the query menu.
- Start defining another query application.
- Choose option 5, Display status of queries submitted, to view the status of jobs you have submitted to create and/or execute query applications.

You can review the status of your query by selecting option 3 from the query execution and report menu or option 5 from the query create/change menu.

EXAMPLE 3: DETAIL LIST WITH SELECT AND SORT

Use this example as a model if you want a detail list that:

- 1 Shows only some of the fields you select on the field review prompt(s)
- 2 Shows fields in an order that is different from the order defined for the file you are listing from
- 3 Shows column headings that are defined for the file
- 4 Shows only certain of the records contained in the record format(s) you select on the file review prompt(s)
- 5 Shows records in an order that is different from the order defined for the file
- 6 Prints selected fields only when the value of the fields changes
- 7 Accumulates the value of a field to provide intermediate subtotals and a grand total
- 8 Begins a new page at specified intervals

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CUSTOMER TYPE ACCTG MTH CUSTOMER NUMBER ORDER NUMBER ORDER AMOUNT TOTAL LINES INVOICE NUMBER

1 4 00019 307 816.06 239 12,970
 00065 264 2,052.65 264 13,854
 00072 264 12,362 264 12,362
 16,978.80 *

1 5 00023 393 748.71 306 16,044
 00064 364 2,153.55 233 15,137
 00103 264 15,002 264 15,002
 5,661.93 *

1 6 00019 413 3,981.78 488 17,220
 00021 383 1,759.43 212 17,466
 00064 264 19,621 264 19,621
 27,617.83 *
 50,258.56 **

7 Subtotal When ACTMTH Changes

7 Subtotal When CUSTYP Changes

8 A new page begins when CUSTYP changes.

07/21/81 12:26:52		Sales Analysis for 20/78				PAGE 2	
CUSTOMER TYPE	ACCTG MTH	CUSTOMER NUMBER	ORDER NUMBER	ORDER AMOUNT	TOTAL LINES	INVOICE NUMBER	
3	4	00011	336	1,201.10	231	13,844	
		00017	280	2,618.37	415	12,346	
		00029					12,654
				40,686.14 °			
3	5	00011	370	2,577.35	373	15,800	
		00025				14,216	
				61,642.34 °			
				159,746.49 °°			
				206,005.05 °°°			
TOTAL NUMBER OF RECORDS PROCESSED 88							

7 Final Total at End of Report

You want to respond to the query prompts so that the report you design:

- Selects only those orders that meet all of the following conditions:
 - Sold to government accounts (CUSTYP = 1), businesses (CUSTYP = 3), or individuals (CUSTYP = 4)
 - Sold in the second quarter of 1978 (ACTMTH is in the range 4 through 6 and ACTYR is 78)
 - Worth \$500 or more (ORDAMT is greater than or equal to \$500)
- Lists only the following fields and lists them across the report in the following order:

CUSTYP, ACTMTH, CUST, ORDER, ORDAMT, TOTLIN, INVNUM
- Prints CUSTYP and ACTMTH only when the values of the fields change
- Sorts records in the following order: customer numbers sorted within each month, and months sorted within each customer type
- Accumulates the total value of orders selected for each customer type, with subtotals for each month, and displays a final total for all customer types

After you respond to the various prompts described earlier in this chapter under *Beginning the Query Definition*, query displays the query definition prompt. Key in responses to the query definition prompt as shown:

QUERY DEFINITION PROMPT

For record format name ORDHDR enter:

FIELD NAME	ORDER	SUM	AVG	SORT	TEST	XLIST	TABLE
CUST	1.0	-	-	X	-	-	-
ORDER	2.0	-	-	-	-	-	-
ORDSTS		-	-	-	-	-	-
ORDAMT	4.0	X	-	-	X	-	-
CUSTYP	.1	-	-	X	X	X	-
OPNSTS		-	-	-	-	-	-
TOTLIN	7.0	-	-	-	-	-	-
INVNUM	8.0	-	-	-	-	-	-
ACTMTH	.3	-	-	X	X	X	-
ACTYR		-	-	-	X	-	-
STATE		-	-	-	-	-	-
		-	-	-	-	-	-
		-	-	-	-	-	-
		-	-	-	-	-	-
		-	-	-	-	-	-
		-	-	-	-	-	-
		-	-	-	-	-	-

You alter and delete the original numbers displayed under ORDER so that only some fields are listed and they are listed in a new order.

You key in X to select fields used to determine the order of the records when the records are sorted.

You key in X for the fields you want to test. The result of the testing determines whether or not a record is included in your report.

The plus sign (+) indicates that there might be more fields to display.

You key in X for ORDAMT to accumulate the field.

You key in X for CUSTYP and ACTMTH because you want to specify additional (extended) information on how to list the fields.

Because you marked XLIST (extended listing) on the query definition prompt, the next prompt that query displays is the extended list prompt. The extended list prompt displayed is for the field CUSTYP, the first field for which you requested extended listing specifications:

EXTENDED LIST PROMPT FOR FIELD CUSTYP

Enter the following:

LIST:	<u>*YES</u>	
SUM:	<u>*NO</u>	
AVG:	<u>*NO</u>	
List only if change:	<u>*NO</u>	
Label:	<u>CUSTOMER</u>	
	<u>TYPE</u>	
Default spacing:	<u>*YES</u>	If *NO, enter number of spaces: <u>2</u>
Edit code:	<u>J</u>	

Respond as shown to specify that CUSTYP be listed only when the value of CUSTYP changes:

EXTENDED LIST PROMPT FOR FIELD CUSTYP

Enter the following:

LIST:	<u>*YES</u>	
SUM:	<u>*NO</u>	
AVG:	<u>*NO</u>	
List only if change:	<u>*YES</u>	
Label:	<u>CUSTOMER</u>	
	<u>TYPE</u>	
Default spacing:	<u>*YES</u>	If *NO, enter number of spaces: <u>2</u>
Edit code:	<u>J</u>	

Key in *YES here to print CUSTYP only when the value of the field changes.

Press the Enter/Rec Adv key to enter your response. Query then displays an extended list prompt for ACTMTH, the other field for which you marked XLIST on the query definition prompt. Again, respond as shown to specify that ACTMTH, like CUSTYP, be printed only when the value of the field changes:

EXTENDED LIST PROMPT FOR FIELD ACTMTH

Enter the following:

LIST:	<u>*YES</u>	
SUM:	<u>*NO</u>	
AVG:	<u>*NO</u>	
List only if change:	<u>*YES</u>	
Label:	<u>ACTG</u>	_____
	<u>MTH</u>	_____
Default spacing:	<u>*YES</u>	If *NO, enter number of spaces: <u>2</u>
Edit code:	<u>J</u>	

Key in *YES here to print ACTMTH only when the value of the field changes.

Press the Enter/Rec Adv key to enter the response.

The next prompt that query displays is the sort specification prompt. You want to respond to the prompt so that:

- Your report reflects the following record order: CUST sorted into ascending sequence for each ACTMTH, ACTMTH sorted into ascending sequence for each CUSTYP, and CUSTYP sorted into ascending sequence.
- Totals for ORDAMT, which you marked for summing on the query definition prompt, are displayed each time ACTMTH changes and each time CUSTYP changes.
- A new page begins each time a subtotal for CUSTYP is printed.

Query then displays the exit application definition menu. At this point you decide to provide a more descriptive page heading for the report. Select option 2 from the exit application definition menu, and press the Enter/Rec Adv key. Query then displays the query modify menu. When the query modify menu is displayed, there is a 1 in the Option field and the record format name is filled in.

QUERY MODIFY MENU

Select one of the following:

1. Output specification	6. Compute processing
2. Record sampling	7. Select/omit processing
3. Delete record format	8. Table definition
4. Add record format	9. Sort specification
5. Field definition	

Option: 1

Qualifying record format name: ORDHDR

Add/delete record format name: _____

Leave 1 here to see the existing responses to the output specification prompt.

Press the Enter/Rec Adv key. Query displays the output specification prompt as you responded to it earlier.

OUTPUT SPECIFICATION PROMPT

Enter the following:

Cover page: Customer orders

Page heading: Order File Query

Detail listing: *YES Detail list double spaced: *NO
Output line width: 132 Separate record format headings: *YES

You change the displayed page heading.

OUTPUT SPECIFICATION PROMPT

Enter the following:

Cover page: Customer orders

Page heading: Sales Analysis for 2Q/78

Detail listing: *YES Detail list double spaced: *NO
Output line width: 132 Separate record format headings: *YES

When you have completed modifying the definition, press the Enter/Rec Adv key to display the query modify menu. Press the EXIT (CF1) key at the query modify menu to display the exit application definition menu.

EXIT APPLICATION DEFINITION MENU

Select one of the following:

1. Restart definition
2. Modify definition
3. Delete definition
4. Save definition
5. Create application interactively
6. Create application in batch

Option: 6

Accept option 6 and press the Enter/Rec Adv key.

Query then displays the application creation prompt.

Retain all the defaults and press the Enter/Rec Adv key. This is the end of the application definition prompting sequence.

Query then displays the query execution prompt. Query displays the Job description name and Library name specified on the query creation prompt. You cannot change these on the query execution prompt. Complete the query execution prompt and press the Enter/Rec Adv key.

Query then submits your job to create and execute the query application ORDERS. Query returns you to the query create/change menu. Query displays a message at the bottom of this display:

Application definition saved in program ORDERS.MYLIB.

Press the Roll Up key to display a second message:

Job ORDERS.user name.job# submitted for application ORDERS.MYLIB.

Query notifies your work station when your job has completed execution by setting on the message waiting indicator and activating the buzzer. Press the CF6 key to display this message.

At the query create/change menu, you can:

- Press the CF2 key to return to the query menu.
- Start defining another query application.
- Choose option 5, Display status of queries submitted, to view the status of jobs you have submitted to create and/or execute query applications.

You can review the status of your query by selecting option 3 from the query execution and report menu or option 5 from the query create/change menu.

EXAMPLE 4: SUMMARY LIST

Unlike a detail list, which shows one line of information for each record selected for the detail list, a summary list shows only field totals and field averages that result from all records selected. Intermediate subtotals can also be specified for a summary list.

This example is a summary of the report created under Example 3 in this chapter. Use this example as a model if you want a report that shows only:

- Subtotals and totals for accumulated fields
- Fields that cause subtotals to be displayed

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CUSTOMER TYPE	ACCTG MTH	ORDER AMOUNT
1	4	16,978.80 °
1	5	5,661.93 °
1	5	27,617.83 °
1		50,258.56 °°

Subtotals When ACTMTH Changes

Subtotals When CUSTYP Changes

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CUSTOMER TYPE	ACCTG MTH	ORDER AMOUNT
3	4	40,686.14 °
3	5	53,418.01 °
3	6	61,642.34 °
3		155,746.49 °°
		206,005.05 °°°

TOTAL NUMBER OF RECORDS PROCESSED 88

Final Total

To summarize the report shown in Example 3, only two changes would need to be made to Example 3.

1. On the output specification prompt for the example, *Detail listing*: *YES would be changed to *Detail listing*: *NO, as shown:

OUTPUT SPECIFICATION PROMPT			
Enter the following:			
Cover page:	<u>Customer Orders</u>		
Page heading:	<u>Sales Analysis for 2Q/78</u>		
Detail listing:	<u>*NO</u>	Detail list double spaced:	<u>*NO</u>
Output line width:	<u>132</u>	Separate record format headings:	<u>*YES</u>
Record sampling:	<u>*NO</u>		
File review:	<u>*YES</u>	Display all fields in prompt:	<u>*YES</u>
Take defaults for all selected fields:			<u>*NO</u>

2. XLIST would not be marked on the query definition prompts: for a summary list, query lists only those fields that are summed or averaged.

Note that the only fields to be displayed in the summary report are:

- ORDAMT, which would be marked for summing on the query definition prompt
- CUSTYP and ACTMTH, which control subtotals as specified on the sort specification prompt

When you have completed the design of the application, the exit application definition menu is displayed. Accept option 6 from the menu and query will display the application creation prompt. Retain all the defaults (including execution following creation) and press the Enter/Rec Adv key.

This is the end of the application definition prompting sequence.

Query then displays the query execution prompt. Query displays the Job description name and Library name specified on the query creation prompt. You cannot change these on the query execution prompt. Complete the query execution prompt and press the Enter/Rec Adv key.

Query then submits your job to create and execute the query application ORDERS. Query returns you to the query create/change menu. Query displays a message at the bottom of this display:

Application definition saved in program ORDERS.MYLIB.

Press the Roll Up key to display a second message:

Job ORDERS.user name.job# submitted for application ORDERS.MYLIB.

Query notifies your work station when your job has completed execution by setting on the message waiting indicator and activating the buzzer. Press the CF6 key to display this message.

At the query create/change menu, you can:

- Press the CF2 key to return to the query menu.
- Start defining another query application.
- Choose option 5, Display status of queries submitted, to view the status of jobs you have submitted to create and/or execute query applications.

You can review the status of your query by selecting option 3 from the query execution and report menu.

EXAMPLE 5: TABLE, MAJOR CLASSES ONLY

Tables are introduced under *Tables* in Chapter 1. Review that discussion before proceeding through this example.

Use this example as a model if you want a table that:

- 1 Classifies records according to the value of one field in the records, the major class field, so that you can analyze classes of records numerically
- 2 Forms a class for each unique value of the major class field, and summarizes the records within each class
- 3 Counts the records in each class of records and displays a total record count
- 4 Ranks each class by record count
- 5 Computes the average value a field has within each class, and computes a total average for the field to show the average value the field has in all of the records processed
- 6 Ranks each class by the average value of a field in the class

The page heading is from the output specification prompt.

Date and time are displayed by query.

Pages are numbered by query.

STATE	COUNT OF RECORDS	RANK BY COUNT OF RECORDS	AVG OF ORDER AMOUNT	RANK BY AVG OF ORDER AMOUNT
MN	357	2	1,198.16	1
ND	45	4	910.85	3
SD	252	3	989.23	2
WI	4d8	1	907.51	4
*OTHER	0	0	.00	0
	1,142 *		1,016.53 *	
TOTAL NUMBER OF RECORDS PROCESSED 1142				

STATE is the major class field.

The table created in this example is a summary report. Therefore, the example requires a change in the responses described for the output specification prompt under *Beginning the Definitions* in this chapter. Change the entry *Detail listing: *YES* to *Detail listing: *NO*, then respond to the file and field review prompts as described earlier in this chapter under *Beginning the Query Design*. Query displays the query definition prompt:

QUERY DEFINITION PROMPT							
For record format name	ORDHDR	enter:					
FIELD NAME	ORDER	SUM	AVG	SORT	TEST	XLIST	TABLE
CUST	1.0	-	-	-	-	-	-
ORDER	2.0	-	-	-	-	-	-
ORDSTS	3.0	-	-	-	-	-	-
ORDAMT	4.0	-	-	-	-	-	-
CUSTYP	5.0	-	-	-	-	-	-
OPNSTS	6.0	-	-	-	-	-	-
TOTLIN	7.0	-	-	-	-	-	-
INVNUM	8.0	-	-	-	-	-	-
ACTMTH	9.0	-	-	-	-	-	-
ACTYR	10.0	-	-	-	-	-	-
STATE	11.0	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-

You do not want to specify SUM or AVG for the fields named on the display. You will specify them for the table later.

You want to select ORDHDR records according to the value of STATE. You then want to classify the selected records according to the value of STATE: that is, you want to designate STATE as the single class field (major class field) for a table. You respond to the query definition prompt as shown:

QUERY DEFINITION PROMPT

For record format name ORDHDR enter:

FIELD NAME	ORDER	SUM	AVG	SORT	TEST	XLIST	TABLE
CUST	1.0	-	-	-	-	-	-
ORDER	2.0	-	-	-	-	-	-
ORDSTS	3.0	-	-	-	-	-	-
ORDAMT	4.0	-	-	-	-	-	-
CUSTYP	5.0	-	-	-	-	-	-
QPNSTS	6.0	-	-	-	-	-	-
TOTLIN	7.0	-	-	-	-	-	-
INVNUM	8.0	-	-	-	-	-	-
ACTMTH	9.0	-	-	-	-	-	-
ACTYR	10.0	-	-	-	-	-	-
STATE	11.0	-	-	-	X	-	X
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-

+

Key in X here to select records according to the value of STATE.

Key in X here to classify selected records according to the value of STATE.

The plus sign (+) in the lower right corner of the prompt indicates that the prompt can be continued in another display. Because you do not need more blank lines for adding field names and specifications to the query definition prompt, you do not need to continue the second display of the prompt. Instead, press the Enter/Rec Adv key. Query then displays the selection test prompt.

Press the Enter/Rec Adv key to enter your selection test responses. Query then displays another selection test prompt so that you can continue to specify tests. Press the Enter/Rec Adv key again to proceed from the selection test prompt to the table class definition prompt. Query displays the table class definition prompt, because you specified STATE as a table field on the query definition prompt.

MAJOR TABLE CLASS DEFINITION PROMPT FOR STATE

Select one of the following by entering X:

- Tabulate on values specified in next prompt
- Tabulate for every value that occurs in the data
- Tabulate into evenly spaced intervals
 - Interval size: 10.00
 - Default intervals: *YES If *NO, enter value: 10
 - Default base value: *YES If *NO, enter value: .00
- Tabulate into evenly populated intervals
 - Number of intervals: 10

Extended print prompt: *NO Minor class name: _____

You could choose the second option on the prompt, thus directing query to tabulate for every value that occurs in your data. However, query performs more efficiently if you provide specific class values.

Because of your preceding responses to the selection test prompt, you know that the records from which your table is to be created will contain only four values of STATE. The values are MN, ND, SD, and WI. Because only these few values are available for forming record classes, and because you know each of the values, you respond to the table class definition prompt as shown:

MAJOR TABLE CLASS DEFINITION PROMPT FOR STATE

Select one of the following by entering X:

- Tabulate on values specified in next prompt
- Tabulate for every value that occurs in the data
- Tabulate into evenly spaced intervals
- Interval size: 10.00
- Default intervals: *YES If *NO, enter value: 10
- Default base value: *YES If *NO, enter value: .00
- Tabulate into evenly populated intervals
- Number of intervals: 10
- Extended print prompt: *NO Minor class name: _____

Key in X here so that you can specify known class values.

Press the Enter/Rec Adv key to enter your responses to the class value definition prompt. Query displays the table computation prompt:

TABLE COMPUTATION PROMPT FOR STATE						
Enter the following for this table:						
Count records: <u>*YES</u>			Extended count function: <u>*NO</u>			
Table computation fields (optional):						
FIELD NAME	ORDER	SUM	AVG	XSUM	XAVG	XPRINT
<u>ORDER</u>	<u>1.0</u>	-	-	-	-	-
<u>ORDSTS</u>	<u>2.0</u>	-	-	-	-	-
<u>ORDAMT</u>	<u>3.0</u>	-	-	-	-	-
<u>CUSTYP</u>	<u>4.0</u>	-	-	-	-	-
<u>OPHSTS</u>	<u>5.0</u>	-	-	-	-	-
<u>TOTLIN</u>	<u>6.0</u>	-	-	-	-	-
<u>INVNUM</u>	<u>7.0</u>	-	-	-	-	-
<u>ACTMTH</u>	<u>8.0</u>	-	-	-	-	-
<u>ACTYR</u>	<u>9.0</u>	-	-	-	-	-
_____	_____	-	-	-	-	-
_____	_____	-	-	-	-	-
_____	_____	-	-	-	-	-
_____	_____	-	-	-	-	-

The table computation prompt names all numeric fields that were displayed on the query definition prompts: the prompt identifies the numeric fields so that you can specify computations for your table. The numbers under ORDER in the prompt identify the sequence in which the fields are selected for computations.

Respond to the table computation prompt with requests for the extended record count option and extended averaging of the field ORDAMT:

TABLE COMPUTATION PROMPT FOR STATE

Enter the following for this table:
 Count records: *YES Extended count function: *YES
 Table computation fields (optional):

FIELD NAME	ORDER	SUM	AVG	XSUM	XAVG	XPRINT
<u>ORDER</u>	<u>1.0</u>	-	-	-	-	-
<u>ORDSTS</u>	<u>2.0</u>	-	-	-	-	-
<u>ORDAMT</u>	<u>3.0</u>	-	-	-	X	-
<u>CUSTYP</u>	<u>4.0</u>	-	-	-	-	-
<u>OPNSTS</u>	<u>5.0</u>	-	-	-	-	-
<u>TOTLIN</u>	<u>6.0</u>	-	-	-	-	-
<u>INVNUM</u>	<u>7.0</u>	-	-	-	-	-
<u>ACTMTH</u>	<u>8.0</u>	-	-	-	-	-
<u>ACTYR</u>	<u>9.0</u>	-	-	-	-	-
_____	_____	-	-	-	-	-
_____	_____	-	-	-	-	-
_____	_____	-	-	-	-	-
_____	_____	-	-	-	-	-

Key in X here to request the extended averaging option for ORDAMT.

Key in *YES here to request the extended record count option.

Press the Enter/Rec Adv key to enter your responses.

Thus far, you have specified a table in which ORDHDR records are classified according to four values of STATE. You have also asked for extended counts and averages on the records that compose each record class. Extended counts and averages, as well as extended summations, are specified in extended table computation prompts.

When you press the Enter/Rec Adv key to enter your responses to the table computation prompt, query displays the extended table computation prompt for record counts. Select functions as shown:

Because you entered
*Count records: *YES*
on the table computation prompt, this response appears automatically.

Key in X here to request ranking of record classes by the count of records in each class.

EXTENDED TABLE COMPUTATION PROMPT FOR COUNT

Select one or more of the following for field *RECORDS

- Print the computed number
- Print the rank of the number (low number is rank 1)
- Print the rank of the number (high number is rank 1)
- Order the printing by the rank of the number (low first)
- Order the printing by the rank of the number (high first)
- Print a cumulative number
- Print the number as a percentage
- Print the cumulative number as a percentage

When you press the Enter/Rec Adv key to enter the extended count responses, query displays the extended print computed values prompt. Query automatically displays the prompt whenever extended count functions are chosen.

```
EXTENDED PRINT COMPUTED VALUES PROMPT FOR *RECORDS

Enter the following:
Label:      RECORDS
            _____
            _____

Edit code:  J
Default spacing: *YES  If *NO, enter number of spaces: 1
```

*RECORDS in the first line of the extended print computed values prompt indicates that the prompt is for record counts. The other values shown in the prompt are default values provided by query. Because the column label, edit code, and spacing values provided by query are acceptable, press the Enter/Rec Adv key to enter the values as responses to the prompt.

When you press the Enter/Rec Adv key to enter your responses to the extended print computed values prompt, query displays the extended table computation prompt for ORDAMT averages. Because you want to know the average value of ORDAMT in each record class, and because you want to rank record classes by the average value of ORDAMT, respond to the prompt as shown:

EXTENDED TABLE COMPUTATION PROMPT FOR AVG

Select one or more of the following for field ORDAMT

- Print the computed number
- Print the rank of the number (low number is rank 1)
- Print the rank of the number (high number is rank 1)
- Order the printing by the rank of the number (low first)
- Order the printing by the rank of the number (high first)

After you press the Enter/Rec Adv key, query displays the exit application definition menu.

```

                                EXIT APPLICATION DEFINITION MENU

Select one of the following:
  1. Restart definition
  2. Modify definition
  3. Delete definition
  4. Save definition
  5. Create application interactively
  6. Create application in batch

Option:      6

```

Accept option 6 and press the Enter/Rec Adv key.

Query then displays the application creation prompt. Retain all the defaults (including execution following creation) and press the Enter/Rec Adv key.

This is the end of the application definition prompting sequence.

Query then displays the query execution prompt. Query displays the Job description name and Library name specified on the query creation prompt. You cannot change these on the query execution prompt. Complete the query execution prompt and press the Enter/Rec Adv key.

Query then submits your job to create and execute the query application ORDERS. Query returns you to the query create/change menu. Query displays a message at the bottom of this display:

Application definition saved in program ORDERS.MYLIB.

Press the Roll Up key to display a second message:

Job ORDERS.user name.job# submitted for application ORDERS.MYLIB.

Query notifies your work station when your job has completed execution by setting on the message waiting indicator and activating the buzzer. Press the CF6 key to display this message.

At the query create/change menu, you can:

- Press the CF2 key to return to the query menu.
- Start defining another query application.
- Choose option 5, Display status of queries submitted, to view the status of jobs you have submitted to create and/or execute query applications.

You can review the status of your query by selecting option 3 from the query execution and report menu or option 5 from the query create/change menu.

EXAMPLE 6: TABLE, MAJOR AND MINOR CLASSES

Tables are introduced under *Tables* in Chapter 1. Review that discussion and example 5 before proceeding through this example.

Use this example as a model if you want a table that:

- Classifies records into major classes and minor classes. Classification is according to the values of two fields in the records, a major class field and a minor class field.
- Coordinates minor classes with major classes so that you can numerically analyze several minor classes within each major class.
- Forms major record classes from an increment within the major class field, and summarizes the records within each major class.
- Forms a minor record class for each unique value of the minor class field, and summarizes the records within each minor class.
- Counts the records in each major and minor class.
- Computes the average value a field has in each major and minor class.

Major Classes Minor Classes

ORDER AMOUNT		CUSTOMER TYPE 1		CUSTOMER TYPE 2		CUSTOMER TYPE 3		CUSTOMER TYPE *OTHER	
		COUNT OF RECORDS	AVG OF ORDER AMOUNT	COUNT OF RECORDS	AVG OF ORDER AMOUNT	COUNT OF RECORDS	AVG OF ORDER AMOUNT	COUNT OF RECORDS	AVG OF ORDER AMOUNT
LT	.00	0	.00	0	.00	0	.00	0	.00
GE	.00	33	261.29	435	194.37	85	244.97	0	.00
GE	500.00	24	744.09	106	691.26	49	741.93	0	.00
GE	1,000.00	20	1,198.22	7	1,042.69	54	1,246.40	0	.00
GE	1,500.00	22	1,696.00	0	.00	28	1,729.77	0	.00
GE	2,000.00	45	1,981.34	3	.00	156	3,836.29	0	.00
TOTAL NUMBER OF RECORDS PROCESSED 1064									

These classes are automatically formed by query.

The table created in this example is a summary report. Therefore, the example requires a change in the responses described for the output specification prompt under *Beginning the Query Design* earlier in this chapter. Change the entry *Detail listing: *YES* to *Detail listing: *NO*, then respond to the file and field review prompts as described earlier in this chapter under *Beginning the Definitions*. Query displays the query definition prompt.

You want to select ORDHDR records according to the value of CUSTYP. You also want to form two record classes from the selected records: major classes according to the value of ORDAMT (fields down the left side of page), and minor classes according to CUSTYP (fields across the top of the page). Respond to the query definition prompt as shown (you will specify the minor class field on a subsequent prompt):

QUERY DEFINITION PROMPT

For record format name ORDHDR enter:

FIELD NAME	ORDER	SUM	AVG	SORT	TEST	XLIST	TABLE
CUST	1.0	-	-	-	-	-	-
ORDER	2.0	-	-	-	-	-	-
ORDSTS	3.0	-	-	-	-	-	-
ORDAMT	4.0	-	-	-	-	-	X
CUSTYP	5.0	-	-	-	X	-	-
OPNSTS	6.0	-	-	-	-	-	-
TOTLIN	7.0	-	-	-	-	-	-
INVNUM	8.0	-	-	-	-	-	-
ACTMTH	9.0	-	-	-	-	-	-
ACTYR	10.0	-	-	-	-	-	-
STATE	11.0	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-

Key in X here to select records according to the value of CUSTYP.

Key in X here to select ORDAMT as the major class field.

Press the Enter/Rec Adv key to enter your responses to the query definition prompt.

Press the Enter/Rec Adv key to enter your selection test responses. Query then displays another selection test prompt so that you can continue to specify tests. When you press the Enter/Rec Adv key again to proceed from the selection test prompt, query displays the table class definition prompt for the major class field (down the left side of the report). Query displays the prompt because you marked TABLE on the query definition prompt:

MAJOR TABLE CLASS DEFINITION PROMPT FOR ORDAMT

Select one of the following by entering X:

- Tabulate on values specified in next prompt
 - Tabulate for every value that occurs in the data
 - Tabulate into evenly spaced intervals
 - Interval size: 10.00
 - Default intervals: *YES If *NO, enter value: 10
 - Default base value: *YES If *NO, enter value: ,00
 - Tabulate into evenly populated intervals
 - Number of intervals: 10
- Extended print prompt: *NO Minor class name:

You want to respond to the table class definition prompt to:

1. Define four major classes based on \$500 increments in the value of ORDAMT, beginning with a value of \$.00.
2. Identify CUSTYP as the minor class field.

Respond to the table class definition prompt as shown:

```
MAJOR TABLE CLASS DEFINITION PROMPT FOR ORDAMT

Select one of the following by entering X:
- Tabulate on values specified in next prompt
- Tabulate for every value that occurs in the data
  X Tabulate into evenly spaced intervals
    Interval size:      500.00
    Default intervals: *NO If *NO,enter value:  4
    Default base value: *NO If *NO,enter value:  .00
- Tabulate into evenly populated intervals
  Number of intervals: 10
Extended print prompt: *NO Minor class name:  CUSTYP
```

Complete this section of the prompt as shown to define four major classes based on \$500 increments beginning with value \$.00.

Key in CUSTYP here to designate CUSTYP as the minor class field.

Press the Enter/Rec Adv key to enter your responses. Because definition of the major classes is now complete, query displays a table class definition prompt for the minor class.

You could choose the second option on the table class definition prompt, thus directing query to tabulate for every value that occurs in your data. However, query performs more efficiently if you provide specific class values.

Because of your preceding responses to the selection test prompt, you know that the records from which your table is to be created will contain only three values of CUSTYP. The values are 1, 2, and 3. Because only these few values are available for forming minor record classes, and because you know each of the values, you respond to the table class definition prompt as shown:

Key in X here so that you can specify known minor class values.

CUSTYP is the minor class field.

MINOR TABLE CLASS DEFINITION PROMPT FOR CUSTYP

Select one of the following by entering X:

- Tabulate on values specified in next prompt
- Tabulate for every value that occurs in the data
- Tabulate into evenly spaced intervals

Interval size: 10.00

Default intervals: *YES If *NO, enter value: 10

Default base value: *YES If *NO, enter value: .00

Extended print prompt: *NO

After you press the Enter/Rec Adv key to enter your response to the table class definition prompt, query displays the class value definition prompt, as you requested. To specify that the three selected values of CUSTYP be used to form minor classes (across the top of the report), respond to the prompt as shown:

CLASS VALUE DEFINITION PROMPT FOR CUSTYP

Enter class values:
REL VALUES
*EQ 1
*EQ 2
*EQ 3

_____+

Each of the three lines defines a minor record class for a selected value of CUSTYP: one class for CUSTYP equals (*EQ) 1, one for CUSTYP equals 2, and one for CUSTYP equals 3.

The plus sign (+) in the lower right corner of the prompt indicates that the prompt can be continued in another display. You would continue the prompt, by pressing the Roll ↑ (Roll Up) key, only if you needed more blank lines than are shown in order to specify all the class values that are to be formed from CUSTYP.

Press the Enter/Rec Adv key to enter your responses to the class value definition prompt. Definition of minor classes is now complete: you have requested a minor class for each of the three selected values of CUSTYP.

Because definition of the major and minor table classes is complete, query displays the table computation prompt:

TABLE COMPUTATION PROMPT FOR ORDAMT						
Enter the following for this table:						
Count records: <u>*YES</u>			Extended count function: <u>*NO</u>			
Table computation fields (optional):						
FIELD NAME	ORDER	SUM	AVG	XSUM	XAVG	XPRINT
<u>ORDER</u>	<u>1.0</u>	-	-	-	-	-
<u>ORDSTS</u>	<u>2.0</u>	-	-	-	-	-
<u>ORDAMT</u>	<u>3.0</u>	-	-	-	-	-
<u>CUSTYP</u>	<u>4.0</u>	-	-	-	-	-
<u>OPNSTS</u>	<u>5.0</u>	-	-	-	-	-
<u>TOTLIN</u>	<u>6.0</u>	-	-	-	-	-
<u>INVNUM</u>	<u>7.0</u>	-	-	-	-	-
<u>ACTMTH</u>	<u>8.0</u>	-	-	-	-	-
<u>ACTYR</u>	<u>9.0</u>	-	-	-	-	-
<u> </u>	<u> </u>	-	-	-	-	-
<u> </u>	<u> </u>	-	-	-	-	-
<u> </u>	<u> </u>	-	-	-	-	-
<u> </u>	<u> </u>	-	-	-	-	-

The table computation prompt is displayed for major classes only. The prompt names all the numeric fields that were displayed on the query definition prompts: the prompt identifies the numeric fields so that you can specify computations for your table. The numbers under ORDER in the prompt identify the sequence in which the fields are selected for computations.

Respond to the table computation prompt with requests to count records by class and average ORDAMT by class:

Accept the default of
*YES to count records.

TABLE COMPUTATION PROMPT FOR ORDAMT

Enter the following for this table:
Count records: *YES Extended count function: *NO
Table computation fields (optional):

FIELD NAME	ORDER	SUM	AVG	XSUM	XAVG	XPRINT
ORDER	1.0	-	-	-	-	-
ORDSTS	2.0	-	-	-	-	-
ORDAMT	3.0	-	X	-	-	-
CUSTYP	4.0	-	-	-	-	-
OPNSTS	5.0	-	-	-	-	-
TOTLIN	6.0	-	-	-	-	-
INVNUM	7.0	-	-	-	-	-
ACTMTH	8.0	-	-	-	-	-
ACTYR	9.0	-	-	-	-	-
_____	_____	-	-	-	-	-
_____	_____	-	-	-	-	-
_____	_____	-	-	-	-	-
_____	_____	-	-	-	-	-

+

Key in X here to request
average ORDAMTs.

Press the Enter/Rec Adv key to enter your responses.

Query displays the exit application definition menu.

```

                                EXIT APPLICATION DEFINITION MENU

Select one of the following:
  1. Restart definition
  2. Modify definition
  3. Delete definition
  4. Save definition
  5. Create application interactively
  6. Create application in batch

Option:      6

```

Accept option 6 and press the Enter/Rec Adv key.

Query then displays the application creation prompt. Retain all the defaults (including execution following creation) and press the Enter/Rec Adv key.

This is the end of the application definition prompting sequence.

Query then displays the query execution prompt. Query displays the Job description name and Library name specified on the query creation prompt. You cannot change these on the query execution prompt. Complete the query execution prompt and press the Enter/Rec Adv key.

Query then submits your job to create and execute the query application ORDERS. Query returns you to the query create/change menu. Query displays a message at the bottom of this display:

Application definition saved in program ORDERS.MYLIB.

Press the Roll Up key to display a second message:

Job ORDERS.user name.job# submitted for application ORDERS.MYLIB.

Query notifies your work station when your job has completed execution by setting on the message waiting indicator and activating the buzzer. Press the CF6 key to display this message.

At the query create/change menu, you can:

- Press the CF2 key to return to the query menu.
- Start defining another query application.
- Choose option 5, Display status of queries submitted, to view the status of jobs you have submitted to create and/or execute query applications.

You can review the status of your query by selecting option 3 from the query execution and report menu or option 5 from the query create/change menu.

Press the Enter/Rec Adv key. Query displays the output specification prompt as you responded to it earlier.

OUTPUT SPECIFICATION PROMPT

Enter the following:

Cover page: Customer orders

Page heading: Order File Query

Detail listing: *YES Detail list double spaced: *NO
Output line width: 132 Separate record format headings: *YES

You change the displayed page heading.

OUTPUT SPECIFICATION PROMPT

Enter the following:

Cover page: Customer orders

Page heading: Sales Analysis for 2Q/78

Detail listing: *YES Detail list double spaced: *NO
Output line width: 132 Separate record format headings: *YES

When you have completed modifying the definition, press the Enter/Rec Adv key to display the query modify menu. Press the Exit (CF1) key at the query modify menu to display the exit application definition menu.

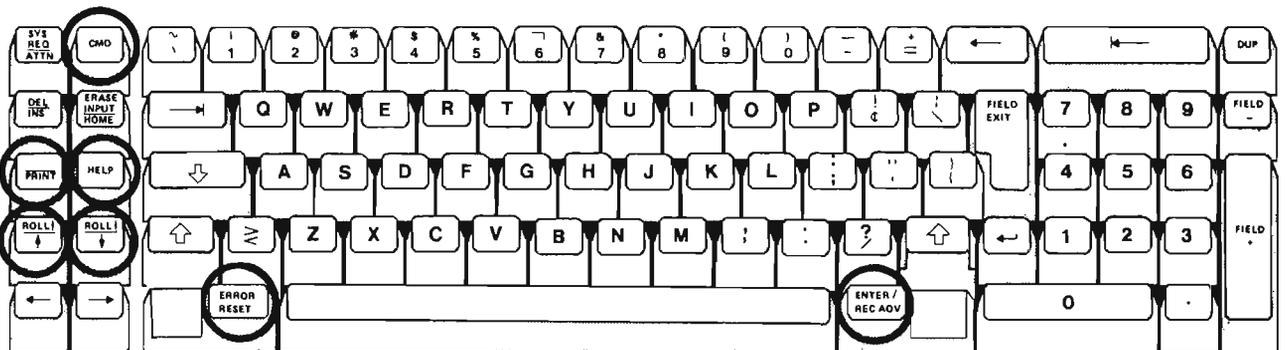
Chapter 4. How to Use Function Control Keys and Command Function Keys

This chapter discusses the query function control keys and command function keys that are used to create or change an application. For more information on how to use a System/38 work station and for a description of the keyboards available for System/38, see the *Programmer's/User's Work Station Guide*.

FUNCTION CONTROL KEYS

Several function control keys on the work station keyboards are especially helpful to query users. The following keyboard highlights those keys:

IBM 5251/5252 Typewriter-Like Keyboard



**Function
Control Key**

Description



Activates command function keys. Command function keys are available to query users. The keys are described later in this chapter. To request the function assigned to one of the command function keys, press the Cmd (command) key, then press the command function key you want to use.



- Enters options selected from menus and proceeds to the next menu or prompt.
- Enters responses keyed in prompts and proceeds to the next menu or prompt.



Unlocks the keyboard so that you can correct an error. If you make an error in responding to a prompt, an error message is displayed on the last line of the display screen. To clear the error condition, press the Error Reset key, correct the error, and press the Enter/Rec Adv key.



Displays help text and second-level messages. If a menu or prompt is displayed, press the Help key to see help text associated with the menu or prompt. Help text describes the options available in a menu and the values asked for in a prompt.

If an error message is displayed, place the cursor beneath the message and press the Help key to see a second-level message.

To return from help text to the interrupted menu or prompt, press the CF1 key.

To return from a second-level message to the interrupted menu or prompt, press the Enter/Rec Adv key.

**Function
Control Key**

Description



Prints the current display. For example, you might want a printed copy of your responses to the query definition prompts. Such a copy could help you plan modifications to the definition. To request a printout of your responses, press the Print key while your responses are being displayed. Then press the Enter/Rec Adv key to enter your responses.



Continues a display. Press the Roll ↑ (Roll Up) key to see the next display in a group of continued displays. Press the Roll ↓ (Roll Down) key to see the preceding display in a group of continued displays. Continuation of a query display is indicated by a plus sign (+) in the lower right corner of the display.

For example, the help text associated with some of the query prompts requires more than one display. Use a Roll key to proceed from one display to another. Similarly, the query field review prompt may require two or more displays to show all fields in a record format. Use a Roll key to proceed from one of the displays to another.

COMMAND FUNCTION KEYS

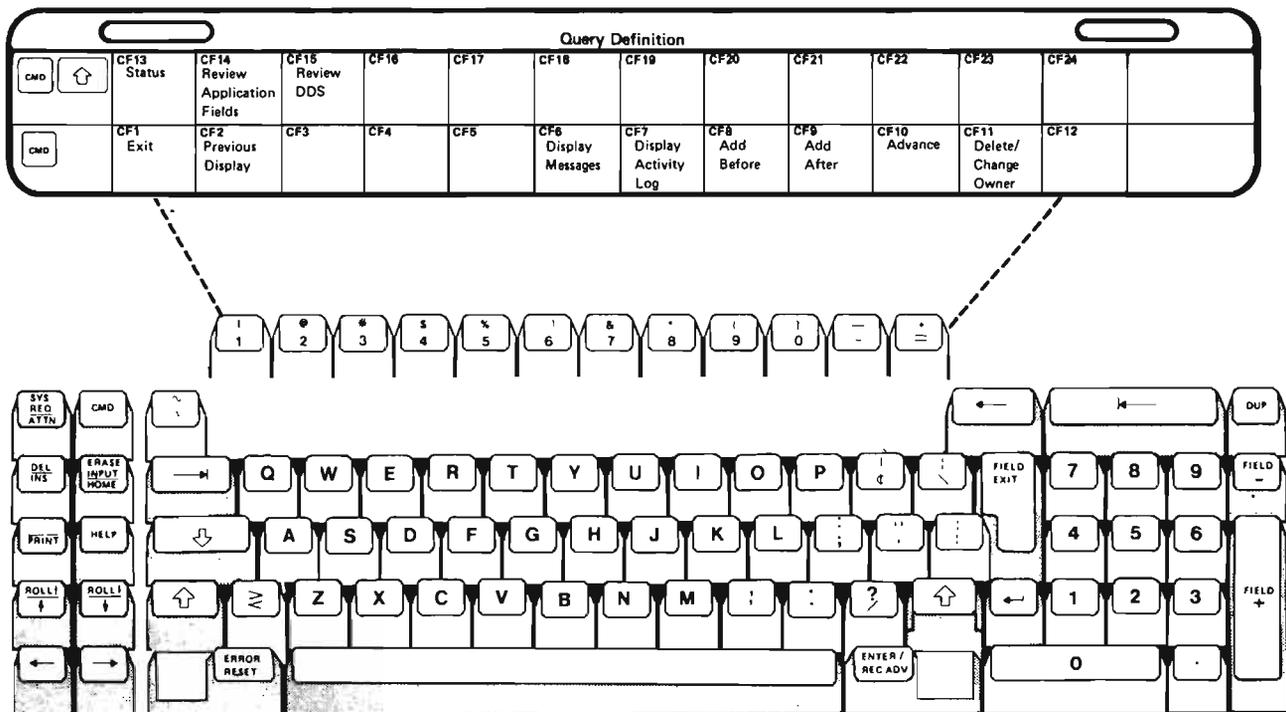
Query command function keys are available to authorized users of query. The command function keys are identified at work stations by keyboard templates.

Many of the command function keys work only when you are modifying the definition of a query application. For a complete guide to using the keys to modify a query definition, see *Changing an Application* in Chapter 5.

Both query and CPF assign functions to command function keys. The function assigned to a key by CPF can be different from the function assigned to the same key by query. The function of a key at any given time depends on whether you are interacting with CPF or with query. Query controls the command function keys when you are responding to the definition prompts. CPF controls the keys before you request query and after you complete the definition of a query application. For example, when you are responding to the command entry display to request query, CPF controls the command function keys. This manual describes the command function keys as they are defined by query. For a description of the keys as they are defined by CPF, see the *Programmer's/User's Work Station Guide*.

Keyboard Template

Typewriter-Like Keyboard



Summary of Query Command Function Keys

Name of Key	System Console	Typewriter-Like Keyboard	Description
Add After	CF9	(9	Creates a new prompt from changes keyed in on an existing prompt and adds the new prompt to the definition of a query application. The new prompt is placed in the definition after the original prompt, and the original prompt is kept in the definition. Query then displays the prompt <i>after</i> the prompt you have just added.
Add Before	CF8	* 8	Creates a new prompt from changes keyed in on an existing prompt and adds the new prompt to the definition of a query application. The new prompt is placed in the definition before the original prompt, and the original prompt is kept in the definition. You remain on the original prompt.
Advance	CF10) 0	In a sequence of modifications to a definition, the next primary prompt, if any, is displayed.
Delete/ Change Owner	CF11	- -	Deletes an entire prompt from the definition of a query application. If the deleted prompt required responses to subsequent prompts, those prompts are also deleted. Pressing this key while the delete query confirmation display is displayed deletes the application you have specified. Pressing this key while the change query owner prompt is displayed assigns a new owner, one that you have specified, to the query.
Display Activity Log	CF7	& 7	Displays the query activity log; pending operations are suspended.
Display Messages	CF6	▭ 6	Displays the work station messages; pending operations are suspended.
Exit	CF1	 1	Displays the query menu from most query displays; pending operations are ignored. Press the Exit (CF1) key to exit query when the query menu is displayed. When you are using the interactive definition prompts, pressing the Exit (CF1) key displays the exit application definition menu.
Previous Display	CF2	@ 2	Accepts new input and presents the previous display. You can use this key to return to a definition display that you have just left to change or correct a response while changing a definition.
Review Application Fields	CF14	@ 2	Displays a description of the fields selected or specified in the definition of a query application.
Review DDS	CF15	# 3	Displays a description of all record formats defined for the file referred to by a query application and permits a review of field descriptions for each record format.
Status	CF13	 1	Displays the status of the definition of a query application.

Add After and Add Before: Lower shift  and 

Pressing these keys provides a way to expand query definitions interactively. The keys allow you to specify:

- A new result field (compute processing prompt)
- A new selection test group (selection test prompt)
- A field not selected previously (extended list prompt)
- A new table (table class definition prompt)

You can add specifications to a definition by adding a new prompt to the definition. You create the new prompt from one that already exists in your definition. To create the prompt, first identify the existing prompt from which the new prompt is to be created.

Use the query modify menu to identify the prompt from which you want to create another prompt. For a guide to using the menu, see *Changing an Application* in Chapter 5.

After you select an option on the query modify menu, respond to the prompt that appears: blank out the values that you do not want in the new prompt, and key in the values that you do want in the new prompt. In other words, change the original prompt until it looks like the prompt that you want to add to your definition.

When your modifications to the original prompt are complete, press an Add key to insert the new prompt in your definition. The keys function identically except that pressing the Add After (CF9) key adds a new prompt after an existing prompt and pressing the Add Before (CF8) key adds a new prompt before an existing prompt. In either case, the new prompt is created and remains displayed, and the original prompt remains in the definition unchanged. After you press an Add key, you can return to the query modify menu by using either the Enter/Rec Adv key or the Advance (CF10) key.

Notes:

1. The Add keys insert entire prompts into a definition; they do not insert changes into an existing prompt. To change individual values in a prompt, key in over the existing values and press the Enter/Rec Adv key.
2. The Add keys cannot be used to add output, record sampling, or sort specifications to a definition. You add output, record sampling, or sort specifications to a definition by: (1) selecting the appropriate option on the query modify menu, (2) keying in additions on the displayed prompt, and (3) entering the additions by pressing the Enter/Rec Adv key.

Advance: Lower shift



The Advance (CF10) key is valid only during a modification sequence; that is, Advance is valid only after you select an option from the query modify menu.

If you chose option 7, *Select/omit processing*, on the query modify menu, press the Advance key to proceed to the next selection test prompt that exists in your definition. If you chose option 8, *Table definition*, on the query modify menu, press the Advance (CF10) key to proceed to the next major table class definition prompt that exists in your definition.

For example, assume that you chose option 8 on the query modify menu. If a class value definition prompt is being displayed and you want to see the major table class definition prompt for the next table in your definition, press the Advance (CF10) key. Query displays the next major table class definition prompt, bypassing table computation prompts that exist for the previous table.

If you chose option 7 or 8 on the query modify menu, but another selection test or major table class definition prompt, respectively, does not exist in your definition, query displays the query modify menu when you press the Advance (CF10) key.

Note: If you press the Advance (CF10) key, query ignores any changes you keyed in on the prompt that was being displayed when you pressed the Advance (CF10) key.

Delete/Change Owner: Lower shift



Pressing the Delete/Change Owner (CF11) key deletes an entire prompt from the definition of a query application. Press the Delete/Change Owner (CF11) key when the prompt you want to delete is displayed. If you delete a prompt from a query definition, you delete all values you entered on the prompt. You also delete all values entered on prompts that were called by the deleted prompt. For example, if you delete a table computation prompt, you also delete any extended computation prompts requested on that prompt.

The Delete/Change Owner (CF11) key is valid only during a modification sequence; that is, the Delete/Change Owner (CF11) key is valid only after you select an option from the query modify menu.

Pressing this key while the delete query confirmation is displayed deletes the application you have specified.

Pressing this key while the change query owner prompt is displayed assigns a new owner, one that you have specified, to the query application.

Notes:

1. If you want to delete the definition of a result field (compute processing prompt), first remove all references to the field from the definition of your application.
2. Use the Delete/Change Owner (CF11) key only to remove entire prompts from a query definition. To remove individual values from a prompt, erase (blank out) the values, then press the Enter/Rec Adv key.

Display Activity Log: Lower shift



Pressing this key while using query displays the query activity log. See *Query Activity Log Display* in Chapter 8 for an explanation of this display.

Display Messages: Lower shift



Pressing this key while using query displays those work station messages that have been sent to that work station.

Exit: Lower shift



If you have finished creating or changing a query definition, pressing the Exit (CF1) key displays an exit application definition menu and checks for errors in the definition. If you are viewing help text, pressing this key lets you leave the help text. Pressing this key during other query prompting displays the query menu.

Previous Display: Lower shift



Pressing this key accepts new input and presents a previous display. You can use this key to return to a display that you have just left to change or correct a response while changing a definition. This key is inactive during the creation of a definition.

Review Application Fields: Upper shift

@
2

So that you can review the data fields you selected in your definition of a query application, press the Review Application Fields (CF14) key to cause the following kind of display to appear:

FIELD REVIEW PROMPT FOR RECORD ORDHDR			
FIELD NAME	LENGTH	TYPE	DESCRIPTION
K CUST	5	A	Customer number
K ORDER	5,0	P	Order number
ORDSTS	1,0	P	Order status
ORDAMT	8,2	P	Order amount
CUSTYP	1,0	P	Customer type: 1=Gov 2=Sch 3=Bus 4=Pvt 5=Oth
OPHSTS	1,0	P	Open order status: 1=Open 2=Closed 3=Canceled
TOTLIN	3,0	P	Total items in order
INVNUM	5,0	P	Invoice number
ACTMTH	2,0	P	Accounting month of sale
ACTYR	2,0	P	Accounting year of sale
STATE	2	A	State abbreviation

The first line of the prompt contains the name of the record format for which fields are being described. Only the fields you selected and used in the definition of your application, including result fields, are displayed in the prompt. If there are more application fields to display from a record format, query displays a plus sign (+) in the lower right corner of the review prompt. When a + does appear in the prompt, you can press the Roll ↑ (Roll Up) key to display additional field descriptions.

Press the Enter/Rec Adv key to review fields that are from a different record format. If there are no other record formats, you are returned to the interrupted definition prompt.

Review DDS: Upper shift

3

So that you can review a description of all fields in each record format that you selected in your definition of a query application, press the Review DDS (CF15) key to cause the following kinds of displays to appear.

This display allows you to select record formats for review.

```
FILE REVIEW PROMPT FOR FILE ORDERS

Enter R to review the fields of a record format:
RECORD FMT DESCRIPTION
_  ORDHDR      Order file header record
```

This display describes all fields in each record format you selected for review.

```
FIELD REVIEW PROMPT FOR RECORD ORDHDR

FIELD NAME  LENGTH  TYPE  DESCRIPTION
K CUST      5       A     Customer number
K ORDER     5,0    P     Order number
ORDDAT     6,0    P     Date order was entered
CUSORD     15     A     Customer purchase order number
SHPVIA     15     A     Shipping instructions
ORDSTS     1,0    P     Order status
OPRNAM     10     A     Operator name
ORDAMT     8,2    P     Order amount
CUSTYP     1,0    P     Customer type: 1=Gov 2=Sch 3=Bus 4=Pvt 5=Oth
OPNSTS     1,0    P     Open order status: 1=Open 2=Closed 3=Canceled
TOTLIN     3,0    P     Total items in order
INVNUM     5,0    P     Invoice number
PRTDAT     6,0    P     Date order was printed
ACTMTH     2,0    P     Accounting month of sale
ACTYR      2,0    P     Accounting year of sale
STATE      2       A     State abbreviation
```

The file review prompt describes the record formats that are defined for the file named in the first line of the prompt. The field review prompt describes the fields that are defined for the record format named in the first line of the prompt. If a plus sign (+) appears in the lower right corner of either the file or the field review prompt, you can press the Roll ↑ (Roll Up) key to display additional record format or field descriptions, respectively, for the file.

Select record formats on the file review prompt by keying in R before each format you want to review. Then, press the Enter/Rec Adv key to proceed to field review prompts for the selected record formats.

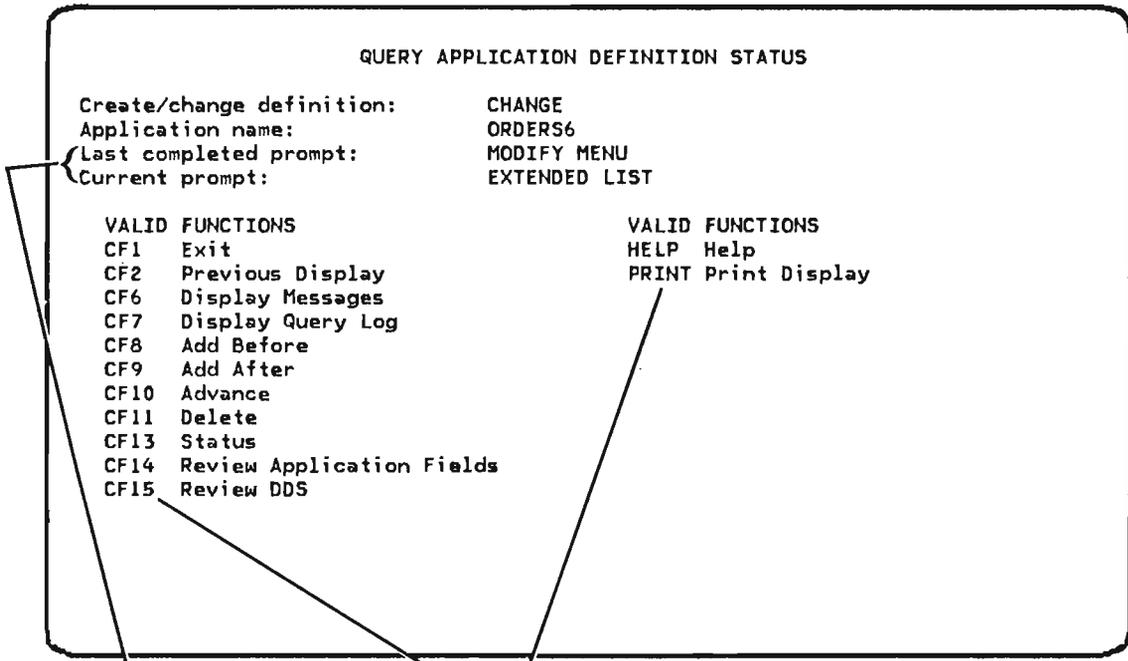
Unlike the field review prompts displayed by the Review Application Fields (CF14) key, the field review prompts displayed by Review DDS display all fields defined for the selected record formats, not just the fields used by your query application. Because result fields are defined only within your applications, result fields are not displayed by this field review prompt.

After you review the fields in a record format, press the Enter/Rec Adv key to review fields in the next record format you selected, if any. If there are no other record formats to review, you are returned to the interrupted definition prompt.

Status: Upper shift 

Pressing the Status (CF13) key displays the current status of the definition process. You can press the Status (CF13) key whenever query is displaying a definition prompt or the query modify menu. The key is invalid when query is displaying the exit application definition menu.

An example of the status display follows.



```
QUERY APPLICATION DEFINITION STATUS

Create/change definition:      CHANGE
Application name:            ORDERS6
Last completed prompt:       MODIFY MENU
Current prompt:              EXTENDED LIST

VALID FUNCTIONS
CF1  Exit
CF2  Previous Display
CF6  Display Messages
CF7  Display Query Log
CF8  Add Before
CF9  Add After
CF10 Advance
CF11 Delete
CF13 Status
CF14 Review Application Fields
CF15 Review DDS

VALID FUNCTIONS
HELP Help
PRINT Print Display
```

If you are interrupted during the definition process, the status display can remind you of the progress you made in defining a query application.

These are the query keys that are valid now.

To return from the status display to the interrupted prompt, press the Enter/Rec Adv key.

Chapter 5. How to Create or Change a Query Application

This chapter discusses how to create or change a query application.

You can create a query application interactively, in one of two ways:

- By answering all the definition prompts to define a query application, or
- By selecting an abbreviated form of interactive design on the output specification prompt which is described in this chapter.

Requesting Query for Interactive Definition

After you enter the Design Query Application (DSNQRYAPP) command, or select option 2 from the programmer menu and select the create or change option, query begins a prompting sequence in which you specify how you want the fields in your file to be listed and what actions (sum, avg, list) should be performed with those fields.

Query will:

- Prompt you for all information that is required to create, maintain, execute, or delete a query application.
- Allow you to display help text for each prompt that is displayed.

You can use any of the command function keys described in this chapter.

Note: The DSNQRYAPP (Design Query Application) command is used throughout this publication. It is possible that you are authorized to use the function limiting commands CHGQRYDEF (Change Query Definition) and CRTQRYDEF (Create Query Definition) instead of the DSNQRYAPP command.

Query Selection List Display

If you entered a generic name of a query, or, *ALL or *ALLUSR for the library name, on the query create/change menu, query displays the query selection list. See *Using Selection Lists* in Chapter 2 for an explanation of the selection criteria used by query in producing this list.

You can use this display to view a list of queries that satisfy generic names. The display of queries is shown sorted by query and library.

A query will appear on this list only if you are explicitly authorized to perform the requested operation on that query.

QUERY SELECTION LIST			
QUERY	LIBRARY	FILE	DESCRIPTION
- OPEN	MYLIB	QORDERS	Open order status
- ORDERS	MYLIB	QORDERS	Order status
- ORDERS5	MYLIB	QORDERS	Order status
- ORDERS6	MYLIB	QORDERS	Order status

1-Select 2-Query information HELP-Help CF2-Previous display

An explanation of this display follows:

1-Select: Place a 1 in front of the query that you want to select. Press the Enter/Rec Adv key and query will perform the requested operation.

2-Query information: Place a 2 in front of the query that you want to display more information about. Query then displays the query information display.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the interrupted display (the query create/change menu, query execution and report, or the query management menu).

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Query Information Display

If you selected option 1, display information about a query, from the query create/change menu, query execution and report menu, or the query management menu, query displays the query information display. This displays specific information about the query you specified on the previous prompt.

```

                                QUERY INFORMATION
Query name:                      OPEN           Library:  MYLIB
Owner:                            SMITH
Creation date/time:              07/21/81 08:25:09
File name:                       QORDERS      Library:  QIDU
Description:                     Open order status

HELP-Help  CF2-Previous display  CF3-File information
```

An explanation of this display follows:

Query name: The name of the query application.

Library: The name of the library where the query application exists.

Owner: The name of the owner of the query.

Creation date/time: The date and time the query was created.

File name: The name of a data base file that is defined by a data description specification. The file contains record formats that are referred to by the query application.

Library: The name of the library where the file used by this query is located.

Description: The text description assigned to the application by the application owner when the application was created.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the query create/change menu, query management menu, query execution and report menu, or the query selection list.

Press the CF3 key to display the file information menu.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Query Information Display Example

```
                                QUERY INFORMATION
Query name:                      OPEN                Library: MYLIB
Owner:                           SMITH
Creation date/time:              07/21/81 08:25:09
File name:                       QORDERS           Library: QIDU
Description:                     Open order status

HELP-Help  CF2-Previous display  CF3-File information
```

This example shows that:

- The query selection listed is named OPEN and is in library MYLIB, using file QORDERS in library QIDU.
- The query application was created by Smith on July 21, 1981.
- The description of the query is 'Open order status'.

Query Create Prompt

If you selected option 2, Create a new query, from the query create/change menu, query displays the query create prompt. You can use this prompt to specify information about a new query you are creating.

```

                                QUERY CREATE PROMPT
Query name:          ORDERS7          Library:    MYLIB
Enter information for new query:
Description:
File name:          *_____ (*+File selection list)
Library name:      _____

HELP-Help  CF2-Previous display  CF3-File information
```

An explanation of this prompt follows:

Query name: This is the name of the new query. This field is filled in and you are not able to key into this field. Query has supplied the query name from the APP parameter on the DSNQRYAPP command or from the name you specified on the query create/change menu.

Library: This is the library containing the new query. This field is filled in and you are not able to key into this field. Query has supplied the library name from the name specified on the create/change menu or on the DSNQRYAPP command.

Description: You can enter a description (up to 50 characters) of the query you are creating.

File name: This is the file that you want to query. If you have supplied a generic name for this file, then query displays the file selection list so you can select a file. You can press the CF3 key to display the file information menu for that file.

Library name: This is the library where the file you want to query is located. If you do not specify a library, query will use *LIBL (library list) to locate the library the file is in. You can also specify *ALL, *ALLUSR, and *LIBL for the library name where:

- *ALL includes all libraries in the system
- *ALLUSR includes all nonsystem libraries and library QGPL.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the query create/change menu.

Press the CF3 key to display the file information menu for the file specified on this display.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

File Selection List Display

If you entered a generic file name on a preceding prompt query displays the file selection list display. This display lists those files that satisfy the generic names you specified on the previous display. See *Using Selection Lists* in Chapter 2 for an explanation of the selection criteria used by query in producing this list.

You can use this display to view a list of files that satisfy generic names. The display of files is shown by file, library, attributes, and description.

A file is shown on this list only if you are authorized to query that file.

FILE SELECTION LIST			
FILE	LIBRARY	ATTR	DESCRIPTION
_ QORDERS	QIDU	PHY	Customer order file

1-Select 2-File information HELP-Help CF2-Previous display

An explanation of this display follows:

File: These are the names of the files that you can query.

Library: This is the name of the library containing the file.

Attributes: These are the attributes assigned to the file.

Description: This is the text description of the query.

The options are:

1—*Select*: Place a 1 in front of the file that you want to select. Press the Enter/Rec Adv key and query will perform the create or change operation for an application using this file.

2—*File information*: Place a 2 in front of the file that you want to display more information about. Query then displays the file information menu.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the create or change prompt.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

File Information Menu

Query displays the file information menu if you requested information about a file.

```

                                FILE INFORMATION MENU

Select one of the following:
  1. Display file member selection list
  2. Display record format list

Option:      _

File name:   QORDERS      Library:  QIDU
Type of file:    PHYSICAL
Type of data in file:  DATA
Description:    Customer order file

HELP-Help  CF2-Previous display
```

The options are:

1. *Display file member selection list:* Select this option to request information about file members as they currently exist in the file.

2. *Display record format list:* Select this option to request a display of the record formats in the file and their descriptions.

File name: This is the name of the file that query is using.

Library: This is the library containing the file being used.

Type of file: This indicates whether the file is LOGICAL or PHYSICAL.

Type of data in file: This indicates whether there is SOURCE or DATA in the file.

Description: This is the text description supplied when the file was created.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the interrupted display.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Member Selection List Display

Query lists the members in the file in alphabetical order.

```
MEMBER SELECTION LIST
File name:  QORDERS      Library:  QIDU
MEMBER NAME  RECORDS  DESCRIPTION
_ QORDERS    1142    Customer order file
```

1-Select HELP-Help CF2-Previous display

The option is:

1-Select: Place a 1 in front of the member that you want to select. Press the Enter/Rec Adv key and query will select the member for the requested operation.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the query execution prompt.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Record Format List Display

Query lists the record formats in the file and their descriptions.

RECORD FORMAT LIST		
File name:	QORDERS	Library: QIDU
FORMAT	FIELDS	DESCRIPTION
_ ORDHDR	16	Order file header record

1-Field list 2-Field attributes

The options are:

1-Field list: Select this option to display the field list for this record format.

2-Field attributes: Select this option to display attributes of all fields.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the file information menu without performing any of the operations selected.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Field List Display

Query shows the fields in the selected record format in the order in which they are defined in the DDS. These are the external and internal fields available for you to query. The description, type (zoned, packed, binary, or character), and length of each field is shown.

Record format:		FIELD LIST		
File name:	ORDHDR	Library:		QIDU
	ORDERS			
FIELD NAME	TYPE	LENGTH	DESCRIPTION	
- K CUST	CHAR	5	Customer number	
- K ORDER	NUM	5,0	Order number	
- ORDDAT	NUM	6,0	Date order was entered	
- CUSORD	CHAR	15	Customer purchase order number	
- SHPVIA	CHAR	15	Shipping instructions	
- ORDSTS	NUM	1,0	Order status	
- OPRNAM	CHAR	10	Operator name	
- ORDAMT	NUM	8,2	Order amount	
- CUSTYP	NUM	1,0	Customer type: 1=Gov 2=Sch 3=Bus 4=Pvt 5=0th	
- OPNSTS	NUM	1,0	Open order status: 1=Open 2=Closed 3=Canceled	
- TOTLIN	NUM	3,0	Total items in order	
- INVNUM	NUM	5,0	Invoice number	
- PRTDAT	NUM	6,0	Date order was printed	
- ACTMTH	NUM	2,0	Accounting month of sale	
- ACTYR	NUM	2,0	Accounting year of sale	
- STATE	CHAR	2	State abbreviation	

1-Field attributes HELP-Help CF2-Previous display

The option is:

1-Field attributes: Enter a 1 in front of any field that you want to display the field attributes for.

After viewing this display press the Enter/Rec Adv key or CF2 key return to the record format list display.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the record format list display.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Field Attributes Display

If you selected option 2, display field attributes, from the record format list display, query displays the field attributes display. This display shows the attributes assigned to the various fields in DDS.

FIELD ATTRIBUTES			
Field name:	CUST	Record format:	ORDHDR
File name:	QORDERS	Library:	QIDU
Description:	Customer number		
Data type:	CHARACTER		
Field length:	5		
Label:	'CUSTOMER 'NUMBER '		
Field usage:	EXTERNAL		
Field type:	KEY		
Key position:	1		
Key order:	ASCENDING		
HELP-Help CF2-Previous display			

An explanation of this display follows:

Field name: The name of the field associated with the attributes.

Record format: The name of the record format that you requested from the record format list.

File name: The name of the file associated with the field attributes.

Library: The library containing the file.

Description: The field description.

Data type: The field data type. The data types are; CHARACTER (ALPHAMERIC), NUMERIC (BINARY), NUMERIC (ZONED), or NUMERIC (PACKED).

Field length: This is the length of the field.

Label: The DDS assigned columns heading for the field.

Field usage: This specifies whether the field is used internally or externally.

Field type: The field type of KEY is listed if the field is used by query.

Key position: This is the position of the key within the record.

Key order: This specifies whether the key is in ascending or descending order.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the record format list or the field list display.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Press the Enter/Rec Adv key to view the next field attribute display selected.

Output Specification Prompt

The output specification prompt requests formatting information about your report. The prompt also allows you to select record samplings and file review.

OUTPUT SPECIFICATION PROMPT

Enter the following:

Cover page: _____

Page heading: _____

Detail listing:	<u>*YES</u>	Detail list double spaced:	<u>*NO</u>
Output line width:	<u>132</u>	Separate record format headings:	<u>*YES</u>
Record sampling:	<u>*NO</u>		
File review:	<u>*YES</u>	Display all fields in prompt:	<u>*YES</u>

Take defaults for all selected fields: *NO

An explanation of this display follows:

Cover page: Enter text for the cover page of your report. Information on the cover should help you distribute the report.

Query provides the following information for the cover:

- Date and time that the report is printed
- Name and location of the query application that created the report
- Name of the file (and its library) reflected by the report
- Record selection tests used, if any
- Sort specifications used to create the report if a file is sorted for the report
- For query applications created using CRTQRYAPP, the name and location of the source member that contains the definition of the application

Page heading: Enter the heading you want shown at the top of each page in the report. Query automatically shows date, time, and page number on each page of the report. A sample page heading is:

79/01/31 5:30 ORDER FILE QUERY Page 1

Detail listing: If you want the report to list all fields selected for the report, leave *YES. If you want a summary report that shows only field totals and field averages resulting from the entire group of selected records, enter *NO.

Sample Detail Column:

Sample Summary Column:

CUSTOMER TYPE	ORDER AMOUNT	CUSTOMER TYPE	ORDER AMOUNT
1	123.00	1	728.00
1	200.00	2	326.00
1	405.00		
	728.00*	⌋	⌋
2	10.00		
2	316.00		
	326.00*		
⌋	⌋		

Detail list double spaced: If you want the detail listing to be single spaced, accept the *NO default value. If you enter *YES, double spacing is specified for the detail lines. If a detail line is folded, double spacing occurs after the fold.

Separate record format headings: To separate different record format headings by showing them on different lines in the report, leave *YES. (Data fields for different record formats are always shown on different lines.) If you do not want to separate record format headings, enter *NO. Examples that demonstrate this option for a key-sequenced file follow.

- Example of column headings that are separated

The following example shows two record formats. Headings and fields for the second record format are shaded.

Note: Column headings change each time the record format changes. If several records are listed for each occurrence of a record format, headings are not repeated for each of the individual records. For example, if several detail records are listed after each header record, column headings are not repeated for each of the detail records.

NAME	STATE	EMPNBR	
Jones	MN	10011	
	ORDERS	EMPNBR	DATE
	52	10011	1/1/79
NAME	STATE	EMPNBR	
Smith	WI	10019	
	ORDERS	EMPNBR	DATE
	68	10019	1/1/79
NAME	STATE	EMPNBR	
Loomis	IA	10037	

- Example of column headings that are not separated

The following example shows two record formats. Headings and fields for the second record format are shaded. EMPNBR is defined as the key field for both record formats.

Notes:

1. Although column headings for the different record formats are printed on the same line, fields from the different formats are not printed on the same line.
2. The column headings for all the formats are printed together on one line at the top of the listing.
3. The primary sort key is the leftmost field listed. Query uses the column heading indicated for the primary sort field in the first record format. Thus, even though a primary sort field for another format may be a different field, it is listed in the first column under the column heading of the first format's sort field.
4. The sort fields for the first format are listed to the right of the primary sort. The sort keys for the following sorts are then listed.

EMPNBR	NAME	STATE	ORDERS	DATE
10011	Jones	MN		
10011			52	1/1/79
10019	Smith	WI		
10019			68	1/1/79
10037	Loomis	IA		

Output line width: Specify the line width you want. The minimum line width that can be specified is 50; the maximum line width is 396. For displayed reports, 77 is useful if your display screen has 80 characters per line. To request display reports select option 4 of the execution and report menu, or specify OUTPUT (*) on the QRYDTA command.

Query prints a report in two parts if the output line width exceeds either:

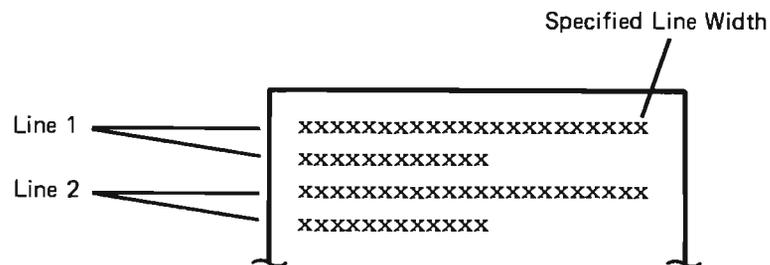
- The forms width on the query execution prompt or
- The width parameter of the QRYDTA command

The two listings are formatted so that they can be placed side by side to form one complete listing. Query attempts to repeat page headings on both listings, but may truncate the headings on the second listing so that they conform to the line width of the second listing.

If a report other than a table exceeds the specified line width, query folds (continues) print lines a maximum of two times the specified line width and truncates the excess. If a report of a table exceeds the specified line width, query truncates the excess on a computation column or a minor class column. Query does not fold lines in tables.

You can create another report with new tables that contain the data that was truncated, or you can create new tables in the same report.

An example of folded print lines follows:



Examples of table truncation follow:

Truncation on a Computation Column

This information is dropped.

79/01/31		5:30:01		Order File Query		Page 1	
STATE	COUNT OF RECORDS	RANK BY COUNT OF RECORDS	AVERAGE OF ORDER AMOUNT				
MN	26	3	384.21				
ND	43	1	381.93				
SD	21	4	350.27				
WI	32	2	402.15				
		122*	382.27*				
TOTAL NUMBER OF RECORDS PROCESSED			122				

RANK BY
AVERAGE OF
ORDER
AMOUNT

2
3
4
1

Truncation on a Minor Class Column

This information is dropped.

79/01/31		5:30:01		ORDER FILE QUERY				PAGE 1	
ORDER AMOUNT		CUSTOMER TYPE		AVERAGE OF ORDER AMOUNT		AVERAGE OF ORDER AMOUNT		CUSTOMER TYPE	
		1						3	
				COUNT OF RECORDS		COUNT OF RECORDS		COUNT OF RECORDS	
GE	.00	LT	500.00	30	419.82	12	164.15	61	393.26
GE	500.00	LT	1,000.00	75	715.26	38	747.79	155	801.92
GE	1,000.00	LT	1,500.00	123	1,204.46	27	1,148.73	308	1,215.37
GE	1,500.00	LT	2,000.00	61	1,615.71	6	1,701.54	197	1,652.43
GE	2,000.00			6	2,296.15	0	0.00	43	2,301.17
TOTAL NUMBER OF RECORDS PROCESSED				1142					

CUSTOMER
TYPE
3

AVERAGE OF
ORDER
AMOUNT

61
155
308
197
43

You can create another report with new tables that contain the data that was truncated, or you can create new tables in the same report.

The following fields do not appear when you are modifying a definition:

Record sampling: If you want to list or analyze only a sample of a file, enter *YES. You will be prompted for record sampling specifications. If you do not want to sample the records in a file, leave *NO.

Record sampling can be useful for analyzing a large file statistically.

File review: If you want to review the record formats contained in the file that your report is to reflect, or if you want to select record formats and fields before you see the query definition prompt, leave *YES: *YES specifies that query display the file and field review prompts. Otherwise, enter *NO to specify that you want to bypass the file and field review prompts.

Display all fields in prompt: If you enter *NO for *File review*, but you want the query definition prompt to display all field names for each record format, leave *YES. If you enter *NO for *File review* and you want to enter all field names on the query definition prompt yourself, enter *NO.

Take defaults after field selection: Specify *YES if you want to quickly create an application (fast path). If you choose this method, you need only specify on the file and field review prompts the data base file, record format names, and field names required in the application. After you do this, query will create an application from these fields while supplying defaults for them.

While this method of definition is the most direct way to define an application, often it does not provide you with the most efficient definition. Generating a fast path application may not be suited for all applications because you cannot specify a listing sequence different from the sequence defined in the data description specifications. This may not be the ideal listing sequence. Additionally, this method of creating a definition does not allow processing options such as summing or averaging of the fields.

Although there are limitations in using this method for listing, it can be beneficial in other uses. You could create and use a default application to list some sample data and then display the data to check the results of some data modification. A fast path application can be quickly created for one-time, special-purpose use.

Record Sampling Prompt

If you specify record sampling on the output specification prompt, query displays the record sampling prompt:

RECORD SAMPLING PROMPT

Enter the following:

Number of records after which processing should stop: 999999

Number of records to skip after each processed record: 0

Query can sample the records in a file in two ways:

- By processing only a specified number of records. The first entry on the record sampling prompt specifies the maximum number of records to be processed for a report. If the file contains fewer records than the number specified, processing stops at the end of the file.

This manner of record sampling is performed after record selection and sorting, which is specified in response to the selection test prompt. For example, if a file contains 10 000 records and you select only the first 1000 by way of the selection test prompt, record sampling is performed on those 1000 records, not upon the original base of 10 000 records. The selection test prompt is described in this chapter.

- By reading records at specified intervals. Query reads the first record in the file and then skips a specified number of records before reading another one. Query continues to skip the same number of records each time a record is read. The second entry on the record sampling prompt specifies the number of records to be skipped each time a record is read. For example, if you specify a skip factor of 19, query processes every twentieth record: 1, 21, 41, and so on.

This manner of record sampling is performed before the performance of any selection tests specified in response to the selection test prompt: record selection tests are performed on the records that result from the record sampling. The selection test prompt is described in this chapter.

For example, assume a file has 5000 records and each record has a customer type code of 1 through 5. If you request to sample every tenth record and to select only the records with a customer type of 1, query checks every tenth record to see if it has a customer type code of 1. Consequently, 500 records are examined and the number selected can vary from 0 to 500. Because the record sampling is performed before the selection testing, it is possible that even though there are many records with a customer type code of 1, none will appear in the report created by query.

Both methods of record sampling can be combined in one report. Neither method distinguishes between different record formats that have been selected for the report.

Note: A response of 999999 for *Number of records after which processing should stop* specifies that query process all records in the file.

File Review Prompt

If you request file review on the output specification prompt, query displays the file review prompt. The prompt describes the record formats contained in the file from which you are creating a report. The prompt allows you to select record formats for your report, and allows you to request a description of the fields within those record formats.

```
FILE REVIEW PROMPT FOR FILE QORDERS

For each record format to be used, enter R to review the fields, A to select all
fields, or E to enter the fields later:
  RECORD FMT  DESCRIPTION
  _  ORDHDR   Order file header record
```

Enter R to review field names, attributes, and descriptions; query displays the fields on the field review for the record format. Enter A to review all fields in the record format; query displays the fields on the query definition prompt and bypasses the field review for the record format. Enter E to enter field names for the record format for yourself on the query definition prompt; query displays the query definition prompt and bypasses the field review prompt for the record format.

You must select at least one record format to proceed with the query definition. If you do not select a record format, query displays a message requesting that you select a record format.

For considerations regarding the use of the multiple formats within one query application, see *Multiple Record Formats in One Query Application* in Chapter 9.

Note: If a plus sign (+) appears in the lower right corner of the file review prompt, you can continue the prompt in another display by pressing the Roll ↑ (Roll Up) key. If you do continue the prompt, the display that appears shows the names and descriptions of additional record formats that exist in the file.

Field Review Prompt

If on the file review prompt you request a review of the fields in a record format, query displays field review prompts. The field review prompt allows you to limit your report to significant fields. If you decide you do not want to select any of the fields displayed for a format, press the Enter/Rec Adv key.

```
FIELD REVIEW PROMPT FOR RECORD ORDHDR

Place an X next to each field to be used or enter *ALL: _____
X  FIELD NAME  LENGTH  TYPE  DESCRIPTION
-  K  CUST      5      A     Customer number
-  K  ORDER     5,0    P     Order number
-  ORDDAT      6,0    P     Date order was entered
-  CUSORD      15     A     Customer purchase order number
-  SHPVIA      15     A     Shipping instructions
-  ORDSTS      1,0    P     Order status
-  OPRNAM      10     A     Operator name
-  ORDAMT      8,2    P     Order amount
-  CUSTYP      1,0    P     Customer type: 1=Gov 2=Sch 3=Bus 4=Pvt 5=Oth
-  OPNSTS      1,0    P     Open order status: 1=Open 2=Closed 3=Canceled
-  TOTLIN      3,0    P     Total items in order
-  INVNUM      5,0    P     Invoice number
-  PRDAT      6,0    P     Date order was printed
-  ACTMTH      2,0    P     Accounting month of sale
-  ACTYR      2,0    P     Accounting year of sale
-  STATE      2      A     State abbreviation
```

Field review prompts describe all fields contained in a particular record format. The name of the record format is displayed in the first line of the prompt. The field descriptions for the record format are derived from the data description specifications (DDS) for the file that contains the record format (DDS is introduced in the *CPF Concepts Manual*). The field descriptions show field names, identify field lengths and field types, and provide brief text descriptions (from the TEXT keyword in DDS).

Field lengths are shown in one of two forms: nnnnnn or nnn,nn, with suppression of leading blanks and 0's. A field length shown with a comma indicates a numeric field for which decimal positions are specified. The number of decimal positions specified for the field is displayed after the comma. For example, an entry of 8,2 under LENGTH indicates that the field is numeric, it is 8 positions long, and it contains 2 decimal positions.

Field type can be one of the following:

- A = character
- B = binary (field length shown with decimal positions)
- P = packed decimal (field length shown with decimal positions)
- S = zoned decimal (field length shown with decimal positions)

Note: Query does not support binary fields with digits after the decimal point. You can create a query application from a file that contains binary fields with digits after the decimal point; however, you cannot use these fields in your query application.

For information on the overflow of numeric fields, see *Numeric Field Overflow* in Chapter 9.

Note: If a plus sign (+) appears in the lower right corner of the field review prompt, you can continue the prompt in another display by pressing the Roll ↑ (Roll Up) key. If you do continue the prompt, the display that appears shows the names and descriptions of additional fields that are defined for the record format.

Query Definition Prompt

Your responses to the query definition prompt define the kind of information your report is to contain. You define a report by specifying the operations to be performed on different fields. The names of fields you select for your report are displayed or entered on the query definition prompt. The operations to be performed on the fields are identified by entries under column headings in the prompt. The operations you choose can cause different prompts to be displayed later.

QUERY DEFINITION PROMPT							
For record format name	ORDHDR	enter:					
FIELD NAME	ORDER	SUM	AVG	SORT	TEST	XLIST	TABLE
CUST	1.0	-	-	-	-	-	-
ORDER	2.0	-	-	-	-	-	-
ORDDAT	3.0	-	-	-	-	-	-
CUSORD	4.0	-	-	-	-	-	-
SHPVIA	5.0	-	-	-	-	-	-
ORDSTS	6.0	-	-	-	-	-	-
OPRNAM	7.0	-	-	-	-	-	-
ORDAMT	8.0	-	-	-	-	-	-
CUSTYP	9.0	-	-	-	-	-	-
OPNSTS	10.0	-	-	-	-	-	-
TOTLIN	11.0	-	-	-	-	-	-
INVNUM	12.0	-	-	-	-	-	-
PRTDAT	13.0	-	-	-	-	-	-
ACTMTH	14.0	-	-	-	-	-	-
ACTYR	15.0	-	-	-	-	-	-

The query definition prompt is displayed for each record format you select for your report except when you use the query modify menu. The name of the record format a query definition prompt refers to is shown in the second line of the prompt.

When you use the query modify menu, query displays the query definition prompt only if you add a record format (option 4). However, when you use the query modify menu, you can modify fields on the query definition prompt through other prompts. For example, you can access the sort specification prompt (which corresponds to SORT on the query definition prompt) through the modify menu.

An explanation of the query definition prompt follows:

Field name: If you selected fields on the preceding prompts, the names of the fields you selected are shown in this column. The names are shown in the order defined by DDS for the file from which you are creating a report. You can enter the names of fields you did not select on the preceding prompts.

If you do enter field names on the prompt, enter the names on the blank lines displayed under FIELD NAME. Enter the names beginning in the first position of the first blank line. If you misspell the name of a field that is defined for the file, query interprets the misspelling to be the name of a result field, and will display the compute processing prompt so that you can define the field. Result fields are described in the following paragraphs.

If on the output specification prompt you entered *NO for *File review* and *NO for *Display all fields in prompt*, then the FIELD NAME column is blank. Enter the names of the fields you want to select.

If you want to define a result field, name the field in this column. A result field is a field created to contain the results of computations you specify. For example, NET could be a result field to equal SALES minus COST. You can use result fields in the same way that you can use any other fields, such as for record selection, summing, averaging, sorting, and defining tables.

The name specified for a result field must not already exist in the record format. The name must begin with an alphabetic character, and can be a maximum of 10 characters long. If you name a result field, you will see the compute processing prompt so that you can specify how the result field is to be computed.

An extended list prompt will appear for each result field for which ORDER, SUM, or AVG is specified on the query definition prompt. The extended list prompt appears whether or not XLIST is also specified for the result field.

If you want to use a field to define more than one table, you can repeat the field name in this column. You can repeat the field name as many times as necessary, but only one occurrence of a field name can have something other than TABLE or TEST specified. (For example, ORDER must be blank except for one specification of a field name.)

Order: Decimal numbers in the ORDER column identify fields that are to be listed in your report, and define the sequence in which the fields are to be shown across a page. Numbers are displayed in the form nn.n. Numbers entered can range from .1 through 99.9. Numbers can be entered without a decimal position.

The field with the lowest number is listed leftmost. Numbers that first appear in the ORDER column reflect the sequence specified by a data description specification. You can change or delete the numbers. You can also add numbers for field names you enter. A value of 0 or a blank in the ORDER column eliminates a field from the field listing, but allows you to specify sums, averages, sorts, tests, extended listing options, and tables for the field.

If two or more fields have the same number under ORDER, query lists the fields in the order in which they appear under ORDER. If sorting is specified for an application that contains more than one record format, query automatically positions subtotal control fields at the left of the report (subtotal control fields are specified on the sort specification prompt).

Sum and Avg: If you want your report to show the sum of a numeric field or the average value of a numeric field, enter X under SUM or AVG, respectively, for the field. You can specify both sum and average. Average is computed as the sum of the field divided by the count of the records.

For information on the overflow of numeric fields when summing or averaging fields, see *Numeric Field Overflow* in Chapter 9.

Sums and averages are displayed at the end of the report under column headings for the summed and averaged fields. Sums are marked by an asterisk (*). Averages are marked by a slash (/).

Note: When you specify sum, query adds 5 digits to the spacing you have specified for the output of the summed field.

The following is a sample of reordering fields with summing and averaging.
 The following query definition prompt specifies the output that follows the prompt:

QUERY DEFINITION PROMPT

For record format name OPDHDR enter:

FIELD NAME	ORDER	SUM	AVG	SORT	TEST	XLIST	TABLE
F1	1.0	-	-	-	-	-	-
F2	2.0	X	-	-	-	-	-
F3	3.0	-	-	-	-	-	-
F4	1.7	X	X	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-
_____	_____	-	-	-	-	-	-

Output

	F1	XX	F2	F3
	xx	xx	xx	xx
	xx	xx	xx	xx
	xx	xx	xx	xx
Sum	_____	xx*	xx*	
Avg	_____	xx/		

Sort: If this record format is in a file that is key sequenced, and if you want to use a sort order that is different from the order defined by the data description specification for the file, enter X under SORT for each field on which you want to sort. If this record format is in a file that is arrival sequenced and you want to sort records, enter X under SORT for each field you want to sort on. For both key-sequenced and arrival-sequenced files, you can sort on more than one field. However, the total length of the sort fields plus the total number of sort fields must be less than 103.

If you specify sorting, you will be prompted for sort specifications.

Test: If you want to select records according to the contents of a field, enter X for the field under TEST. You will be prompted for selection tests.

Xlist: If you mark the ORDER, SUM, or AVG column for a field and you want special formatting for the field, enter X under XLIST (extended listing) for the field. The extended list prompt will appear so that you can specify formatting. (The extended list prompt appears automatically for result fields for which ORDER, SUM, or AVG is specified.)

You can mark XLIST for more than one field on the query definition prompt.

Table: If you want to create a table, enter X under TABLE for the field from which major classes, or the only classes, are formed. You will be prompted for definition of the table on the table class definition prompt. The maximum number of fields for which you can mark TABLE in one definition is 20.

+ (Plus Sign): If a plus sign (+) appears in the lower right corner of the query definition prompt, you can continue the prompt in another display by pressing the Roll ↑ (Roll Up) key. If you do continue the prompt, either the display that appears shows field names that were selected for or entered on the prompt previously, along with any options that were specified previously; or the display shows blank lines so that you can specify additional field names and options for the query definition prompt.

Compute Processing Prompt

If you name one or more result fields on the query definition prompt, query displays the compute processing prompt:

COMPUTE PROCESSING PROMPT

For result field ORDAMT enter:
Computed value: _____

Use decimal numbers and field names combined by +,-,*,/,//.
Multiply(*),divide(/),and remainder(//) are done before +,-.

For example, to compute a 10% sales commission based on a field named AMOUNT, enter: AMOUNT * .10

The second line of the compute processing prompt shows the name of a result field. Enter the arithmetic definition of how to compute the result field on the third line. You can leave spaces between the values and the arithmetic signs. Do not enclose the definition with apostrophes. Examples of computed result fields are:

TOTOWE: Computed value: ARBAL + ORDER
MTHAVG: Computed value: SLSYR / 12
SALES: Computed value: PRICE * QTY
COMSION: Computed value: (SALES - COST) * .05

An example of how remainder (//) works is: $15.1 // 7.0 = 1.1$.

Computation begins on the expression that is within the innermost pair of parentheses, if any. Multiplication, division, and obtaining a remainder are performed first, and they are performed from left to right. Addition and subtraction are performed next, from left to right.

The number of decimal positions in the result of addition, subtraction, or obtaining a remainder is equal to the highest number of decimal positions expressed in an operand. The number of decimal positions in the result of multiplication is equal to the sum of the decimal positions in the numbers multiplied. The number of decimal positions in the result of division is equal to the number of decimal positions in the divisor, with excess decimal positions being truncated.

A divisor of 0 yields a result of 0 without error.

Examples of division, where $A = 1.9$ and $B = 10$, are:

$A/B = 0$ (truncated decimal positions)
 $A/(B * 1.0) = .1$ (truncated decimal positions)
 $A/(B * 1.0000) = .1900$

A result field named in an expression must have been defined in a previous compute processing prompt. All fields named must be numeric, but cannot be binary with decimal digits. Query cannot compute the value of a result field from values that exist in different record formats.

The definition of a result field must not:

- Require more than 20 arithmetic operations.
- Contain more than 10 field names.
- Define an intermediate or final result that contains more than 31 digits.

You can specify labels, spacing, and edit codes for result fields on extended list prompts. If you do not use the extended list prompt for a result field, the field name is the column heading, query spaces the column automatically, and the default edit code is J. Edit codes are described under *Extended List Prompt* later in this chapter.

If you specify both *SELECT and *OMIT groups for a record format, the order in which the groups are specified is important. Testing is performed in the order in which the tests are specified, and if a record meets the requirements for either a *SELECT or an *OMIT group, the record is not available for subsequent testing.

*Summary of *Select/*Omit:* The following rules summarize the operation of *SELECT/*OMIT logic:

- If no record selection tests are specified for a record format, all records of that format are selected.
- If one or more selection test groups are specified for a record format, the test groups for that format are performed in the order in which the select/omit groups are specified. If a record satisfies all tests within a particular select/omit group, the record is selected or omitted immediately, and no further tests are performed on the record. If a record does not satisfy all tests within a particular select/omit group, the record is tested according to the specifications in the next select/omit group.
- If a record does not satisfy all tests within any select/omit group, the record is omitted if the last select/omit group is a *SELECT group, or selected if the last select/omit group is an *OMIT group.

An explanation of the selection test prompt follows:

Field name: These are the fields for which you marked TEST on the query definition prompt. A field named can be a result field. If no testing is specified for a field name displayed by query, the field is ignored.

You can enter field names in the spaces provided. The fields must be from the same record format. The same field name can be entered more than once.

Rel: Enter a symbol. The symbol specifies how the value of the *Field Name* must relate to the value you enter under TEST. (TEST is described in a following paragraph). The symbols you can enter are:

- | | |
|---|--|
| *CT, contains (the character string searched for can contain a maximum of 256 characters) | *LE, less than or equal to |
| *EQ, equal to | *LS, in the list of |
| *GE, greater than or equal to | *LT, less than |
| *GT, greater than | *NE, not equal to |
| | *NG, not greater than |
| | *NL, not less than |
| | *RG, in the range of
(the range includes the two delimiting values) |
| | *ST, start (the character string searched for can contain a maximum of 256 characters) |

Notes:

1. The contains (*CT) symbol can be used only for character fields. It selects or omits a record only if all characters specified in the value for *CT are present in the record and are present in the order specified. For example, field values that satisfy the test *CT 'ABC' are: ABC, ABC CO, ABC LTD, ITEM ABC, ABCDEF, XYZABCD, and 12ABC3. Field values that do not satisfy the test are: A B C, ABBC, and ACB.
2. The list (*LS) symbol provides a logical OR capability. For example, in the following selection test

REGION *LS 1 2 3

- a record is selected if it is for region 1, 2, or 3.
3. The start (*ST) symbol can be used only for character fields. It selects or omits a record only if all characters specified in the value for *ST are present in the field as leading characters and in the order that was specified on the selection test prompt. The character string must not be longer than the field being tested. For example, a field value that satisfies the test *ST 'ABC' is ABCDEFG. Field values that do not satisfy the test are XYZABCD, ABBC, and ACB.
 4. If a plus sign (+) appears in the lower right corner of the selection test prompt, you can continue the prompt in another display by pressing the Roll ↑ (Roll Up) key. If you do continue the prompt, either the display that appears shows blank lines so that you can specify additional tests for the test group, or the display shows additional tests that were specified previously.

Values: Enter a value (up to 36 characters) with which the tested field must be compared. The value must be a constant field or a list of constants and fields. The values may consist of one or more constants or field names or a mixture of both. Depending on whether the tested field is numeric or character, the value must be numeric or character, respectively.

Leading 0's and 0's that trail in decimal positions are not significant in numeric values. A character string must be enclosed with apostrophes if it is not a field name(s).

Values that must be computed before they are used in the comparison are not allowed. For example, the value FIELD1 + 1 is not permitted.

Only one value can be entered unless *LS or *RG is specified under REL. *LS requires two or more values, with a maximum of 20. *RG requires two values. The first value must be a smaller value than the second when both values are constants. When multiple values are specified, at least one blank must be left between each value.

+ (Plus Sign) Column: Enter a plus sign (+) in this column if you need additional space to specify an entry under VALUES or if you want to specify the entire entry under VALUES in the next prompt rather than in this prompt. You will see the extended selection test prompt for each field for which you enter +. Only two entries are required on each selection test prompt line when you request the extended selection test prompt: a field name and a + in the + column.

Extended Selection Test Prompt

The extended selection test prompt is requested by a plus sign (+) in the + column of the selection test prompt. The extended selection test prompt allows you to enter characters or additional characters for VALUES. VALUES can contain a maximum of 256 characters, while only 36 characters can be entered on the basic selection test prompt. Note that a character string must be enclosed with apostrophes if it is not a field name.

EXTENDED SELECTION TEST PROMPT

Enter test value:

FIELD NAME	REL	VALUES
<u>ORDAMT</u>	<u>*EQ</u>	<u>100</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

An entry you keyed in on the selection test prompt is displayed at the beginning of the extended selection test prompt. The entry is one that is to be completed.

The extended selection test prompt is displayed once for each entry to be completed; that is, once for each time you entered a plus sign (+) on the selection test prompt. Press the Enter/Rec Adv key each time you complete an entry. When the last entry is completed, query displays either the next selection test prompt (if another one exists) or the next definition prompt.

Entries under REL and VALUES must follow the rules given for REL and VALUES on the selection test prompt.

Extended List Prompt

Query displays the extended list prompt if you do any of the following:

- Mark the XLIST column on the query definition prompt.
- Define a result field on the query definition prompt and specify ORDER, SUM, or AVG for the field.
- Choose option 5 on the query modify menu (the menu is described under *Modify* in Chapter 5).

The first line of the extended list prompt shows the name of the field for which you requested extended listing, or the name of a field for which you are changing specifications if you chose option 5 on the query modify menu. If you chose option 5 and the name of the field you want does not appear in the first extended list prompt, press the Enter/Rec Adv key until the field name does appear (you may have to press Enter/Rec Adv several times).

```

                                EXTENDED LIST PROMPT FOR FIELD ORDAMT

Enter the following:
LIST:                            *YES
SUM:                             *NO
AVG:                             *NO
List only if change:             *NO
Label:                           ORDER AMT.
                                _____
                                _____

Default spacing:                 *YES      If *NO, enter number of spaces:  2
Edit code:                       J

```

An explanation of the extended list prompt follows:

List, Sum, and Avg: The values, *YES or *NO, displayed in these entries reflect the specifications on the query definition prompt under ORDER, SUM, and AVG, respectively. *YES is displayed if you selected the field for listing (you entered a number greater than 0 under ORDER), summing, or averaging; *NO is displayed if you did not request listing, summing, or averaging. You can change the displayed values to change the specifications on the query definition prompt retroactively.

For information on the overflow of numeric fields when summing or averaging fields, see *Numeric Field Overflow* in Chapter 9.

List only if change: If you want your report to show successive duplicate values of the field, leave *NO. If you want to blank out successive duplicate values of the field, enter *YES.

For example, if you leave *NO as the entry for *List only if change* on an extended list prompt for the field whose heading is CUSTOMER NUMBER, columns in your report will look like this:

CUSTOMER NUMBER	AMOUNT
10035	10.00
10035	15.00
10035	13.00
10047	8.00
10051	11.00
10051	14.00
∫	∫

If you enter *YES for *List only if change* on an extended list prompt for the field whose heading is CUSTOMER NUMBER, columns in your report will look like this:

CUSTOMER NUMBER	AMOUNT
10035	10.00
	15.00
	13.00
10047	8.00
10051	11.00
	14.00
∫	∫

Label: By default, the column heading specified by DDS is displayed here. If no column heading is defined, or if the field is a result field, the field name is displayed here. If you want to change the default heading, enter the column heading you want the field to have. The heading can contain any character available on your keyboard, and enclosing apostrophes are not required.

If you want to change a new heading back to the original, enter *SAME. If you want no column heading for the field, enter *NONE or leave this field blank.

For example, assume the DDS does not define a column heading for the field CUST. The *Label* fields in the extended list prompt will initially contain:

CUST

If you enter a *Label* of

Label: CUSTOMER ID
 NO.

the label will be

CUSTOMER ID
NO.

Headings taken from DDS require space only for the actual heading: query does not assume that each heading line is the maximum of 20 characters. Each line you enter under *Label* represents one line in your report headings.

Default spacing and number of spaces: Query spreads all fields and headings evenly across a page. If you want query to space headings and fields, leave *YES as the entry for *Default spacing*. If you want to specify your own field spacing, use *Default spacing* and *number of spaces* entries.

To specify field spacing, enter *NO for *Default spacing* on the extended list prompt for each field, along with an entry for *number of spaces*. Enter in *number of spaces* the number of blanks you want at the left of the heading for the field or at the left of the field value if no heading exists. The maximum number is 99.

If you specify *Default spacing* *NO for at least one field, then for each field with *Default spacing* *NO, the entry in *number of spaces* is used and for each field with *Default spacing* *YES, two blanks are used.

Query allocates the output listing length of a field based on the field lengths in DDS. That is, if a field is defined for a length of 20 but only contains 4 characters, query will allocate space for the field that is based on the length defined in DDS (20). If you have fields in your query application with longer length allocations than you are using, this could make your query listing appear as though query was ignoring your field spacing requests.

Edit code: You do not have to specify an edit code: query uses the edit code specified by the EDTCDE keyword in DDS for the file. For fields for which DDS does not specify an edit code and for result fields, query uses J. If you blank out the code first displayed on the prompt, which is the DDS edit code, query uses X. All edit codes are shown in the following two tables. DDS is introduced in the *CPF Concepts Manual*. Result fields are defined on compute processing prompts. The prompt is described in this chapter.

Edit Code Table

Edit Code	Commas	Decimal Point	Sign For Negative Balance			Zero Suppress	Prints the Number 000000 as
			No Sign	CR	- (Minus)		
1	Yes	Yes	No Sign			Yes	0
2	Yes	Yes	No Sign			Yes	
3		Yes	No Sign			Yes	0
4		Yes	No Sign			Yes	
5-9 ¹							
A	Yes	Yes		CR		Yes	0
B	Yes	Yes		CR		Yes	
C		Yes		CR		Yes	0
D		Yes		CR		Yes	
J	Yes	Yes			-	Yes	0
K	Yes	Yes			-	Yes	
L		Yes			-	Yes	0
M		Yes			-	Yes	
X ²							000000
Y ³						Yes	00/00/00
Z						Yes	.

¹User-defined edit codes.

²The X code performs no editing.

³The Y code suppresses the leftmost 0 only. The Y code edits a 3- to 6-digit field according to the following pattern:

```
nn/n
nn/nn
nn/nn/n
nn/nn/nn
```

These examples assume the system value QDECFMT is set to a blank to have the decimal point (.) and the comma (,) used to separate three digits.

Examples of Using Edit Codes

Edit Codes	Positive Number— 2 Decimal Positions	Positive Number— No Decimal Positions	Negative Number— 3 Decimal Positions	Negative Number— No Decimal Positions	Zero Balance— 2 Decimal Positions	Zero Balance— No Decimal Positions
Unedited	1234567	1234567	00012 ¹	00012 ¹	000000	000000
1	.12,345.67	1,234,567	.120	120	.00	0
2	12,345.67	1,234,567	.120	120		
3	12345.67	1234567	.120	120	.00	0
4	12345.67	1234567	.120	120		
5–9 ²						
A	12,345.67	1,234,567	.120CR	120CR	.00	0
B	12,345.67	1,234,567	.120CR	120CR		
C	12345.67	1234567	.120CR	120CR	.00	0
D	12345.67	1234567	.120CR	120CR		
J	12,345.67	1,234,567	.120–	120–	.00	0
K	12,345.67	1,234,567	.120–	120–		
L	12345.67	1234567	.120–	120–	.00	0
M	12345.67	1234567	.120–	120–		
X	1234567	1234567	00012 ¹	00012 ¹	000000	000000
Y						0/00/00
Z	1234567	1234567	120	120		

¹The EBCDIC values of negative decimal numbers do not print as numerics.
²User-defined edit codes.

If you want to specify an edit code for the field named on an extended list prompt, enter the code in the first position of the *Edit code* entry. The code you specify must be one of the codes shown in the previous two tables. User-defined edit codes require an existing edit mask in DDS for the file you are listing. The CRTEDTD (Create Edit Description) command is used to create edit masks. CRTEDTD is described in the *CL Reference Manual*.

If the edit code for a field is not X, Y, or Z, or one of the user-defined edit codes 5–9, you can enter one of two characters in the second position of the *Edit code* entry:

- To show leading asterisks (*) in your report, enter * in the second position. For example, a 5-position field with a value of 15 and the edit code J* would be shown as ***15.
- To show a floating dollar sign (\$) in your report, enter \$ in the second position. For example, a 5-position field with a value of 15 and the edit code J\$ would be shown as \$15.

Note: Edit codes can be specified only for numeric fields.

Table Class Definition Prompt

If you mark the TABLE column on the query definition prompt, query displays the table class definition prompt. The table class definition prompt has two forms: one for major class fields (down the left side of the report) and one for minor class fields (across the top of the report). The prompt for a major class field is displayed first. If you specify the name of a minor class field on the prompt, query displays a table class definition prompt for minor class fields.

The first line of the table class definition prompt always shows the name of the field from which classes, whether major or minor, are to be formed:

```
MAJOR TABLE CLASS DEFINITION PROMPT FOR XXXXXXXXXXXX

Select one of the following by entering X:
- Tabulate on values specified in next prompt
- Tabulate for every value that occurs in the data
- Tabulate into evenly spaced intervals
  Interval size: 10.00
  Default intervals: *YES If *NO,enter value: 10
  Default base value: *YES If *NO,enter value:           .00
- Tabulate into evenly populated intervals
  Number of intervals: 10
Extended print prompt: *NO Minor class name:           
```

```
MINOR TABLE CLASS DEFINITION PROMPT FOR XXXXXXXXXXXX

Select one of the following by entering X:
- Tabulate on values specified in next prompt
- Tabulate for every value that occurs in the data
- Tabulate into evenly spaced intervals
  Interval size: 10.00
  Default intervals: *YES If *NO,enter value: 10
  Default base value: *YES If *NO,enter value:           .00

Extended print prompt: *NO
```

Choose one of the *Tabulate* options to specify class values for your table. If necessary, query automatically creates a class to contain records not included by the class values you specify.

An explanation of the table class definition prompt follows:

Tabulate on values specified in next prompt: Choose this option if you want to define class values yourself. You will be prompted for the values.

Tabulate for every value that occurs in the data: Choose this option to create a class for every unique value of the major or minor class field. The number of unique values available is affected by specifications, if any, on the selection test prompt.

If you know each of the values available, a more efficient choice than selecting this option is to choose the first option, *Tabulate on values specified in next prompt*, and specify the class values yourself.

If the field contains character data, the class values are ordered on your report according to the standard EBCDIC collating sequence. If the field contains numeric data, query first converts the data to packed decimal format (if it is not already in that format) and then sorts and prints the data on your report according to the internal representation of the data. If you specify *Print Ascending: *NO* on the extended print classes prompt, the order of the class values on your report is reversed. (For examples of how the values are ordered, see the following section.)

Sample of Tabulating for Every Value in the Data

In this sample, a class is established for each unique value of a field, DEPT, and records are counted for each department.

DEPT	COUNT OF RECORDS
ABC	50
DEF	32
GHI	48
∫	∫

Tabulate into evenly spaced intervals: Choose this option to define classes on the basis of fixed increments in the value of the major or minor class field. This option is valid only for numeric fields. You can specify the size of the increments after *Interval size*. The interval size can be positive or negative and from 9999.99 to -9999.99. Apostrophes must not be used to enclose the interval size.

To specify the number of intervals to be included in your report, enter *Default intervals: *NO* and a value. If you specify *Default intervals: *YES*, query computes the number of intervals that are necessary to include all values in your data. Query computes the number by dividing the range of values in the class field by the specified or assumed (10) size of the intervals.

Default base value: *YES means that the first interval begins with the lowest value of the class field if the interval size is positive or with the highest value if the interval size is negative. **Default base value: *NO** allows you to specify a different base for the intervals. For example, if the interval size is 500 and you want intervals 1000-1499, 1500-1999, and so on, specify a base value of 1000.

The base value can be positive or negative and from 99999999.99 to -99999999.99. Apostrophes must not be used to enclose the base value.

Sample of Tabulating into Evenly Spaced Intervals

In this sample, three intervals are established by incrementing by 100 from a base value of 0. The fourth interval is automatically created by query. Records are counted in each interval:

		CLASS	COUNT OF	
		FIELD	RECORDS	
GE	0	LT	100	37
GE	100	LT	200	51
GE	200	LT	300	29
GE	300			6
				123*

To specify the preceding table, respond to the table class definition prompt with the following entries:

```
X  Tabulate into evenly spaced intervals
   Interval size:                100.00
   Default intervals: *NO        If *NO, enter value: 3
   Default base value: *NO       If *NO, enter value: .00
```

Notice that query automatically creates a class "GE 300" to contain records not included by the specified class values. Similarly, if the value of any class field is less than 0, query creates a class "LT 0."

Tabulate into evenly populated intervals: Choose this option to define major class values that span an equal number of records. Query creates the classes by first selecting and sorting records for the table, then counting the records selected, and finally dividing the number of records by *Number of intervals*.

For example, if 1000 records exist in the file, the selection criteria selects only 800, and you specify 10 intervals; the first 80 records (according to the sort specifications) make up the first interval.

This option allows you to summarize data in fourths, tenths, and one-hundredths, and so on. For example, if you want to summarize data in quartiles, specify 4 intervals for the option. If you want to summarize data in percentiles, specify 100 intervals. You can specify 2 through 100 intervals.

Extended Print Prompt: Enter *YES if you want to be prompted for additional formatting information for class fields.

If you want to specify formatting information for major class fields, which are printed down the left side of the table, enter *Extended print prompt*: *YES on the major table class definition prompt. If you want to specify formatting information for minor class fields, which are printed from left to right across the table, enter *Extended print prompt*: *YES on the minor table class definition prompt.

Minor class name: Enter a field name to request minor class fields for the table. Query forms minor classes from the minor class field. You can name one minor class field for each major class field.

Minor classes refine the level of detail presented in a table and enable you to focus on the correlations among different fields in a record. For example, in the following table, ORDER AMOUNT is the major class field and CUSTOMER TYPE is the minor class field. Together, the major and minor classes reveal which customer types yield the most valuable orders within each class of order amounts. The table also clarifies, for each class of order amounts, the difference between the number of orders received from each customer type and the average value of each of those orders.

ORDER AMOUNT		CUSTOMER TYPE 1		CUSTOMER TYPE 2		CUSTOMER TYPE 3		CUSTOMER TYPE *OTHER	
		COUNT OF RECORDS	AVG OF ORDER AMOUNT	COUNT OF RECORDS	AVG OF ORDER AMOUNT	COUNT OF RECORDS	AVG OF ORDER AMOUNT	COUNT OF RECORDS	AVG OF ORDER AMOUNT
LT	<.00	7	.00	0	.00	0	.00	0	.00
GE	<.00 LT	33	261.29	435	174.37	85	244.97	0	.00
GE	500.00 LT	24	744.07	186	691.76	49	741.93	0	.00
GE	1,000.00 LT	20	1,198.22	7	1,042.69	54	1,246.40	0	.00
GE	1,500.00 LT	27	1,576.10	0	.00	28	1,729.77	0	.00
GE	2,000.00	45	2,781.34	0	.00	156	3,936.29	0	.00

TOTAL NUMBER OF RECORDS PROCESSED 1064

These classes are automatically formed by query.

For a description of how the preceding sample table is defined, see *Example 6* in Chapter 3.

Rel and Values: Define class values by entering comparison symbols and compared values under REL and VALUES, respectively.

Your entries specify how the value of the class field must relate to a different value. You specify the relation under REL; you specify the different value under VALUES.

- The symbols you can enter under REL are:

*CT, contains (the character string searched for can contain a maximum of 50 characters)	*LE, less than or equal to
*EQ, equal to	*LS, in the list of
*GE, greater than or equal to	*LT, less than
*GT, greater than	*NE, not equal to
	*NG, not greater than
	*NL, not less than
	*RG, in the range of
	*ST start (the character string searched for can contain a maximum of 50 characters)

- Only one value can be entered for VALUES, unless *LS or *RG is specified under REL. *LS requires two or more values with a maximum of 20. *RG requires two values.
- A character string must be enclosed with apostrophes if it is not a field name.
- If lowercase characters are entered with enclosing apostrophes under VALUES, the characters are not translated to uppercase.

If you cannot define all values for a class field on one class value definition prompt, you can continue the prompt. Press the Roll ↑ (Roll Up) key to display another class value definition prompt for the same class field.

Note: For more information on *CT, *LS, and *ST, see *Selection Test Prompt* earlier in this chapter.

+ (*Plus Sign*): If a plus sign (+) appears in the lower right corner of the class value definition prompt, you can continue the prompt in another display by pressing the Roll ↑ (Roll Up) key. If you do continue the prompt, the display that appears shows blank lines so that you can specify additional class values for your table, or the display shows class values that were specified previously.

Sample Class Value Definition Prompt:

CLASS VALUE DEFINITION PROMPT FOR CUSTYP

Enter class values:
REL VALUES
*EQ 1
*RG 1 10
*LS 11 12 19
*GE 20

_____ *

Extended Print Classes Prompt

Query displays the extended print classes prompt if you entered *Extended print prompt*: *YES on the table class definition prompt. The first line of the extended print classes prompt contains the name of the major or minor class field for which a label and edit code are to be specified.

EXTENDED PRINT CLASSES PROMPT FOR XXXXXXXXXX

Enter the following:
Label classes: XXXXXXXXXX

Edit code: J
Print ascending: *YES

An explanation of the extended print classes prompt follows:

Label classes and edit code: For a description of *Label classes*, see the description of *Label* under *Extended List Prompt* in this chapter. For a description of *Edit code*, see the description of *Edit Code* under *Extended List Prompt* in this chapter.

Print ascending: Leave *YES to print class values in ascending order. Enter *NO to print class values in descending order.

This option is meaningful only if you specified *Tabulate for every value that occurs in the data* on the table class definition prompt. If you specify ordering by rank on the extended table computation prompts, the value for *Print ascending* is ignored. (The extended table computation prompts are described later in this chapter.)

In the following sample, the class values in the field ZIPCODE are in descending order.

ZIP CODE	COUNT OF RECORDS
55927	1
55926	21
55925	32
55924	22
55923	45
55922	118
55921	1
55920	1
55919	1
55918	97
55917	80
55916	101
55915	91
55914	73
55913	1
	1
	1
	1
	1

Table Computation Prompt

Query displays the table computation prompt for each major class field. The name of the major class field is displayed in the first line of the prompt. The table computation prompt allows you to specify the computations you want in your table.

```
TABLE COMPUTATION PROMPT FOR XXXXXXXXXXXX

Enter the following for this table:
Count records: *YES      Extended count function: *NO
Table computation fields (optional):
FIELD NAME  ORDER  SUM  AVG  XSUM  XAVG  XPRINT
XXXXXXXXXX  1.0   -   -   -     -     -
XXXXXXXXXX  2.0   -   -   -     -     -
_____  
_____  
_____  
_____  
_____  
_____  
_____  
_____  
_____  
_____  
_____  
_____  
_____
```

An explanation of the table computation prompt follows:

Count records: Leave *YES to request a record count for each class in the table, and total record counts for all classes. *YES for *extended count function* requests the extended table computation prompt for record count, and also causes query to display the extended print computed values prompt for record counts. Both prompts are described in this chapter. The extended count function can be requested only if you specify *YES for *Count records*.

Field name: This column contains the names of numeric fields only. If the name of a numeric field was shown on the query definition prompt for this record format, the name of the field is repeated here. Query repeats the names of the numeric fields here so that you can specify computations for your table. You may add numeric fields as required. Computations can be specified for a maximum of 10 fields. If no computations (SUM, AVG, XSUM, or XAVG) are specified for a field, the field is ignored by the table computation prompt.

Order: The ORDER column contains numbers in the form nn.n. The numbers indicate the order in which field computations are shown across the page of a report. Zero is the lowest order number allowed. Record count computations, if any, are always shown first. Then, computations for the field with the lowest number under ORDER are shown, then computations for the field with the next highest number are shown, and so on. Numbers under ORDER also indicate the sequence in which query will display extended table computation prompts.

You can change the numbers displayed under ORDER. If ORDER is changed to 0 or blank for a field, the field is ignored by the table computation prompt. A blank order number is equivalent to a zero order number.

Sum and Xsum: An X under SUM requests the summation of a field in each class in the table. An X under XSUM requests the extended table computation prompt for sums. You can choose XSUM without choosing SUM. For information on the overflow of numeric fields when summing fields, see *Numeric Field Overflow* in Chapter 8.

Avg and Xavg: An X under AVG requests the average value of a field in each class in the table. An X under XAVG requests the extended table computation prompt for averages. You can choose XAVG without choosing AVG. For information on the overflow of numeric fields when averaging fields, see *Numeric Field Overflow* in Chapter 9.

Xprint: An X under XPRINT requests the extended print computed values prompt so that you can specify labels, edit codes, and spacing for the fields in your table.

Sample Table Computation

Assume that a table contains three classes. Respond to the following table computation prompt as shown in order to display:

- 1 A record count for each class
- 2 The total value a field has within each class
- 3 The average value a field has within each class

TABLE COMPUTATION PROMPT FOR XXXXXXXXXXX

Enter the following for this table:
 Count records: *YES Extended count function: *NO
 Table computation fields (optional):

FIELD NAME	ORDER	SUM	AVG	XSUM	XAVG	XPRINT
FIELDA	1.0	X	-	-	-	-
FIELDB	2.0	-	X	-	-	-
FIELD C	3.0	-	-	-	-	-
FIELD D	4.0	-	-	-	-	-
FIELD E	5.0	-	-	-	-	-
FIELD F	6.0	-	-	-	-	-

1

2

3

The following table reflects the responses shown on the preceding table computation prompt. The numbered references to information in the table correspond to those of the table computation prompt:

CLASS FIELD	COUNT OF RECORDS	SUM OF FIELD A	AVERAGE OF FIELD B
1	50	19,383.13	6
2	61	26,175.52	8
3	38	8,506.92	4
149*		54,065.57*	7*

Final Totals

+ (Plus Sign): If a plus sign (+) appears in the lower right corner of the table computation prompt, you can continue the prompt in another display by pressing the Roll ↑ (Roll Up) key. If you do continue the prompt, either the display that appears shows additional numeric fields that were selected for the table, or the display shows blank lines so that you can specify more numeric fields for the table.

Extended Table Computation Prompts

Extended table computation prompts appear if you request them on the table computation prompt. There are three extended table computation prompts.

The following is for record counts:

An X always appears here. You can remove it if you do not want the record count in your table.

These two options are valid only for tables that do not have minor classes.

EXTENDED TABLE COMPUTATION PROMPT FOR COUNT

Select one or more of the following for field *RECORDS

- Print the computed number
- Print the rank of the number (low number is rank 1)
- Print the rank of the number (high number is rank 1)
- Order the printing by the rank of the number (low first)
- Order the printing by the rank of the number (high first)
- Print a cumulative number
- Print the number as a percentage
- Print the cumulative number as a percentage

The following is for sums:

An X appears if you entered X under SUM on the table computation prompt. You can remove the X.

These two options are valid only for tables that do not have minor classes.

EXTENDED TABLE COMPUTATION PROMPT FOR SUM

Select one or more of the following for field XXXXXXXXXXX

- Print the computed number
- Print the rank of the number (low number is rank 1)
- Print the rank of the number (high number is rank 1)
- Order the printing by the rank of the number (low first)
- Order the printing by the rank of the number (high first)
- Print a cumulative number
- Print the number as a percentage
- Print the cumulative number as a percentage

The following is for averages:

An X appears if you entered X under AVG on the table computation prompt. You can remove the X.

These two options are valid only for tables that do not have minor classes.

EXTENDED TABLE COMPUTATION PROMPT FOR AVG

Select one or more of the following for field XXXXXXXXXX

- Print the computed number
- Print the rank of the number (low number is rank 1)
- Print the rank of the number (high number is rank 1)
- Order the printing by the rank of the number (low first)
- Order the printing by the rank of the number (high first)

The second line of the extended table computation prompt displays *RECORDS if records are being counted, or it names the field being summed or averaged. If you specify XSUM or XAVG on the table computation prompt or on this prompt for a numeric field and numeric field overflow occurs, any other entry you specify on the extended table computation prompt for SUM or AVG can be affected. For information on the overflow of numeric fields, see *Numeric Field Overflow* in Chapter 9.

To specify how you want counts, sums, and averages shown in your table, choose one or more of the options displayed in the prompts. The options are described here:

Print the computed number: Print the count, sum, or average, whichever is specified in the prompt.

Print the rank of the number: Print the rank of the computed number (high number is rank 1 or low number is rank 1). The rank is determined by the relation of the computed number to other values computed for the record count, or computed for the sum or average of the same field. Ranking is always performed in the context of the entire table. In a table that contains minor classes, ranks are computed by comparing values in all minor classes: ranks are not computed independently within each minor class. Do not choose both rank options on the same prompt.

Note: If the computed value of a field that is being ranked is 0, the rank of the field is 0.

Order the printing by the rank of the number: Print the lines in the table according to the rank of the computed number (high first or low first). Do not choose both options. The following restrictions apply to the use of these options:

- Do not choose either option for a table that contains minor classes.
- If either option is chosen, do not choose either option again in a different extended table computation prompt for the same table.
- If either option is chosen, choose at least one other option on the same prompt: these options call only for the ordering of printed lines; they do not specify printing.

Print a cumulative number: Print the count or sum that has accumulated in the table thus far: Query prints the cumulative number in relation to the entire table. For example, in a table that contains minor classes, the cumulative number pertains to the values in all minor classes: the cumulative number is not computed independently within each minor class.

Print the number as a percentage: Print the computed number as a percentage. The percentage is the percentage of the total count or sum in the entire table.

Print the cumulative number as a percentage: Print the count or sum that has accumulated in the table thus far as a percentage. The percentage is the percentage of the total count or sum in the entire table.

The following sample table shows how the cumulative count of records **3** and the cumulative percent of count of records **5** are accumulated in a table that contains more than one minor class:

	Major Classes			Minor Classes				
	COUNT OF RECORDS	CUMULATIVE COUNT OF RECORDS	PERCENT COUNT OF RECORDS	CUMULATIVE PERCENT OF COUNT OF RECORDS	COUNT OF RECORDS	CUMULATIVE COUNT OF RECORDS	PERCENT COUNT OF RECORDS	CUMULATIVE PERCENT OF COUNT OF RECORDS
{ GT 0	0	0	.0	.0	0	0	.0	.0
{ EQ 0	1	1	2.0	2.0	0	1	.0	2.0
{ * OTHER	1	2	2.0	4.0	48	50	96.0	100.0
TOTAL NUMBER OF RECORDS PROCESSED 50								

Sample Extended Summation

The numbered references to the responses shown in the following extended table computation prompt for sums correspond to those of the resulting sample table:

EXTENDED TABLE COMPUTATION PROMPT FOR SUM

Select one or more of the following for field XXXXXXXXXX

- Print the computed number
- Print the rank of the number (low number is rank 1)
- Print the rank of the number (high number is rank 1)
- Order the printing by the rank of the number (low first)
- Order the printing by the rank of the number (high first)
- Print a cumulative number
- Print the number as a percentage
- Print the cumulative number as a percentage

CLASS FIELD	SUM OF FIELDA	RANK BY SUM OF FIELDA
3	5,279.10	1
2	4,863.15	2
4	4,838.26	3
Total	19,311.70*	4

Note: The cumulative sum, the cumulative percent of sum, the cumulative count, and the cumulative percent of count are accumulated in the same way in a table that contains more than one minor class. (For an example, see *Sample Extended Record Counting* earlier in this chapter.)

Sample Extended Averaging

The numbered references to the responses shown in the following extended table computation prompt for averages correspond to those of the resulting sample table:

EXTENDED TABLE COMPUTATION PROMPT FOR AVG

1 Select one or more of the following for field XXXXXXXXXXXX

2 Print the computed number

Print the rank of the number (low number is rank 1)

Print the rank of the number (high number is rank 1)

Order the printing by the rank of the number (low first)

Order the printing by the rank of the number (high first)

CLASS FIELD	AVERAGE OF FIELDA	RANK BY AVERAGE OF FIELDA
1	75.99	2
2	51.19	1
3	159.97	4
4	98.74	3
Total Average	82.53*	

Extended Print Computed Values Prompt

The extended print computed values prompt requests formatting information for values computed in a table. Query displays the prompt if you request extended count functions or mark XPRINT on the table computation prompt.

If the formatting information requested by the prompt is for record counts, the first line of the prompt contains *RECORDS. If the formatting information is for values computed from a field in your table, the first line contains a field name.

```

                                EXTENDED PRINT COMPUTED VALUES PROMPT FOR *RECORDS

Enter the following:
Label:          RECORDS
                _____
                _____

Edit code:      J
Default spacing: *YES   If *NO, enter number of spaces: 1
```

An explanation of the extended print computed values prompt follows:

Label: The default column heading provided by query for the computations is displayed here. If you want to change the heading, enter the column heading you want. If you want to change a new heading back to the heading provided by query, enter *SAME. If you do not want the computations to have a heading, enter *NONE.

Edit code, default spacing, and number of spaces: The values allowed for these entries are the same as the values allowed for them on the extended list prompt. For a description of the values, see *Extended List Prompt* in this chapter.

If the query application you are designing refers to a file that has a keyed sequence access path, each field name displayed by query under FIELD identifies a field that is either of two types:

- A field for which you specified SORT on the query definition prompt.
- A field defined as a key field by DDS for the file. If a key field defined for the record format includes one or more fields that are not contained in the record format, query displays a message stating that a nondisplayable key field exists. Even though the key field cannot be displayed, you can use the field as a sort field for your application.

If the fields named are in a file that has an arrival sequence access path, the fields are the SORT fields you identified on the query definition prompt.

Values for a sort field are always displayed if the field is used to control subtotals or subtables, both of which are described in a following paragraph. The maximum number of sort fields you can specify for one record format is limited as follows: the total length of the sort fields plus the total number of sort fields must be less than 103.

If a query application contains more than one record format, the first sort field in each record format must be of the same type and must have the same length and number of decimal positions as the first sort field in every other record format. You can display field types, lengths, and numbers of decimal positions by pressing the Review Application Fields (CF14) key or the Review DDS (CF15) key.

Order: If this file has a keyed sequence access path, query displays numbers (in the form nn.n) to indicate the order defined by the data description specification. You can change or delete the numbers. Numbers are not displayed for files that have an arrival sequence access path.

To define a sort order or alter a defined sort order, enter numbers in this column to specify the sort order you want. One decimal position is allowed. Put the lowest number next to the field you want to sort first; put the highest number next to the field you want to sort last.

Zero is the lowest order number allowed. The field with an order number of zero will be sorted first. A blank order number is equivalent to a zero order number.

Note: Do not try to reconstruct the DDS order once you enter a different order on the sort specification prompt. If you want to discard a sort order you defined for a file that has a keyed sequence access path, modify your definition by deleting the sort specification prompt. When you delete the sort specification prompt, query substitutes the sort order defined by DDS for the file.

Subtotal: Identify subtotal control fields by entering X after them under SUBTOTAL. You can request subtotals for more than one control field.

If you marked a field for summation or averaging on the query definition prompt (you entered X under SUM or AVG), you can show subtotals in your report. A subtotal of the summed or averaged field is shown each time the value of a specified control field changes.

For example, ACCT in the following sample is the field that controls the printing of SUM, a field that is being accumulated:

ACCT	SUM
AA	1.00
	1.20
	.90
	3.10*
BB	.90
	.80
⎵	⎵

Identify subtotal control fields by putting Xs after them under SUBTOTAL. You can request subtotals for more than one control field.

Notes:

1. Subtotal control fields are always printed or displayed. On a summary report, subtotals, totals, and control fields are the only fields that appear in the report, and they are printed only when subtotal control fields change.
2. Whenever a subtotal control field is displayed, all subtotal control fields that have a higher number specified in the ORDER column of the sort specification prompt are also displayed.
3. In an application that contains more than one record format, query positions subtotal control fields at the left of the report.

Subtable: If you have defined a table for your report and you specify subtable, query creates a table from all records that contain the first value of a designated sort field. Query then creates another table from all records that contain the next value of the sort field, and continues to compose tables in this manner until all values of the sort field are used. After the subtables are created, query combines all information from the subtables into one final table.

Subtables can also help you to manage the size of table listings. If the specification of minor classes makes a table wider than you prefer, you may be able to change the minor class field to a sort field, specify subtables in the field, and still obtain the information you want, but in a narrower format.

To request subtables, enter X in the Subtable column on the sort specification prompt. Enter X on the line that shows the sort field from which the subtables are to be created.

Subtable Considerations: When requesting subtables, remember that:

- Query prints each subtable and the final table on a new page.
- Your application can only use one record format.
- Subtables can be specified for a maximum of two sort fields. Specifying subtables for more than one sort field, however, can result in a large number of subtables. For example, assume that a query application used two sort fields and that each sort field has 10 values. If you specify subtables for both sort fields, the number of possible subtables is 100.
- In an application that specifies detail listings as well as tables, requesting subtables causes the detail listings to be segmented in the same manner that the tables are segmented. First, query lists the fields from the records used to create the first subtable. After listing the fields from these records, query prints the first subtable. Next, query lists fields from all records that are used to create the second subtable, and then query prints the second subtable. Query continues to print field listings before the subtables until all subtables are printed.

Subtable Examples: The two subtable examples in this section use a file containing these records:

Region	District	Office	Salesperson	Sales
NC	01	A	HANSON	440
NC	01	A	MARTIN	560
NC	01	B	LUKE	480
NC	01	B	SMITH	520
NC	01	B	RYAN	160
NC	55	A	MITCHELL	290
NC	55	A	GRIMES	300
NC	55	A	THOMPSON	410
NC	55	D	BLAKE	630
NC	55	D	WILLIAMS	710
NC	55	D	CAINE	840
NW	01	A	CALLAWAY	100
NW	01	A	JONES	100
NW	01	B	FRANK	150
NW	01	B	MURREY	150
NW	01	B	MARVIN	300
NW	02	C	KALE	200
NW	02	C	EDWARDS	350
NW	02	C	ELLIOTT	350
NW	02	D	HUGHES	200
NW	02	D	VAN RYAN	210
NW	02	D	JACKSON	220
NW	02	D	LANE	230
NW	02	D	LAWSON	240
NW	02	D	JAMES	250

Following is the output for an application that requested the count of records and the sum of sales for each of the two regions, NC and NW, where the table classes are formed by sales intervals of 200 (thousand dollars). REGION, DISTRICT, and OFFICE were specified as sort fields on the query definition prompt. REGION was specified as a subtable control field on the sort specification prompt. Detail listings are printed before each subtable because *Detail Listing: *YES* was specified on the output specification prompt.

This is a detail writing for the first value of REGION.

					PAGE	1
REGION	DISTRICT	OFFICE	SALESPERSON	SALES		
NC	1	A	HANSON	440		
NC	1	A	MARTIN	560		
NC	1	B	LUKE	480		
NC	1	B	SMITH	520		
NC	1	B	RYAN	160		
NC	55	A	MITCHELL	290		
NC	55	A	GRIMES	300		
NC	55	A	THOMPSON	410		
NC	55	D	BLAKE	630		
NC	55	D	WILLIAMS	710		
NC	55	D	CAINE	840		

This is a subtable for the first value of REGION, NC.

				PAGE		2
				REGION NC *		
SALES				COUNT OF RECORDS	SUM OF SALES	
LT	160			0	0	
GE	160	LT	360	3	750	
GE	360	LT	560	4	1,850	
GE	560	LT	760	3	1,900	
GE	760			1	840	
				11 *	5,340 *	

This is a detail listing for the second value of REGION, NW.

					PAGE 3
REGION	DISTRICT	OFFICE	SALESPERSON	SALES	
Nw	1	A	CALLAWAY	100	
Nw	1	A	JONES	100	
Nw	1	B	FRANK	150	
Nw	1	B	MURREY	150	
Nw	1	B	MARVIN	300	
Nw	2	C	KALE	200	
Nw	2	C	EDWARDS	350	
Nw	2	C	ELLIOT	350	
Nw	2	D	HUGHES	200	
Nw	2	D	VAN RYAN	210	
Nw	2	D	JACKSON	220	
Nw	2	D	LANE	230	
Nw	2	D	LAWSON	240	
Nw	2	D	JAMES	250	

This is a subtable for the second value of REGION, NW.

				PAGE 4
		REGION Nw *		
SALES		COUNT OF RECORDS		SUM OF SALES
LT 100		0		0
GE 100	LT 300	11		2,050
GE 300	LT 500	3		1,000
		14 *		3,050 *

This table combines information from the two previously listed subtables.

				PAGE 5
		REGION **		
SALES		COUNT OF RECORDS		SUM OF SALES
LT 100		0		0
GE 100	LT 300	13		2,500
GE 300	LT 500	7		2,630
GE 500	LT 700	3		1,710
GE 700		2		1,550
		25 **		8,390 **

TOTAL NUMBER OF RECORDS PROCESSED 25

Following is the output for an application that requested the count of records and the sum of sales for districts 01 and 55 within region NC and for district 01 and 02 within region NW. The table classes are formed by sales intervals of 200 (thousand dollars). REGION, DISTRICT, and OFFICE were specified as sort fields on the query definition prompt. DISTRICT was specified as a subtable control field on the sort specification prompt. A total of four subtables are printed.

This is a subtable for the first DISTRICT 01, REGION NC.

REGION		DISTRICT		PAGE 2	
NC		1 *			
SALES		COUNT OF RECORDS		SUM OF SALES	
LT 160		0		0	
GE 160	LT 360	1		160	
GE 360	LT 560	3		1,440	
GE 560		1		560	
		5 *		2,160 *	

This is a subtable for the second DISTRICT 55, in REGION NC.

REGION		DISTRICT		PAGE 4	
NC		55 *			
SALES		COUNT OF RECORDS		SUM OF SALES	
LT 160		0		0	
GE 160	LT 360	2		590	
GE 360	LT 560	1		410	
GE 560	LT 760	2		1,340	
GE 760		1		840	
		6 *		3,180 *	

This is a subtable for the first value in DISTRICT 01, in REGION NW.

REGION NW		DISTRICT 1 *	
SALES		COUNT OF RECORDS	SUM OF SALES
LT	100	0	0
GE	100 LT 300	4	500
GE	300 LT 500	1	300
		5 *	800 *

This is a subtable for the second value in DISTRICT 02, in REGION NW.

REGION NW		DISTRICT 2 *	
SALES		COUNT OF RECORDS	SUM OF SALES
LT	100	0	0
GE	100 LT 300	7	1,550
GE	300 LT 500	2	700
		9 *	2,250 *

This table combines information from the four previously listed subtables.

REGION		DISTRICT ***	
SALES		COUNT OF RECORDS	SUM OF SALES
LT	100	0	0
GE	100 LT 300	13	2,500
GE	300 LT 500	7	2,630
GE	500 LT 700	3	1,710
GE	700	2	1,550
		25 **	8,390 ***
TOTAL NUMBER OF RECORDS PROCESSED 25			

Space: Blank lines before and after subtotals help separate sections of your report. If you request subtotals and you want to skip one or more lines before and after a subtotal is printed, enter the number of blank lines under SPACE. Put the number on the same line you marked for subtotals. The value you specify for SPACE is the number of blank lines that query will add before and after a subtotal. For example, if you specify 3, query inserts three blank lines before and three blank lines after a subtotal. If a numeric field has not been summed, and if SUBTOTAL is not marked on the same line as space, any value entered under SPACE is ignored. These blank lines do not appear on your work station display if you hold output to view before printing.

The default value for SPACE is 0. The highest value you can specify for SPACE is 3.

Eject: If you request subtotals and you want your report to begin a new page after a subtotal is shown, enter X in this column. Enter X on the line that shows the subtotal control field. If a numeric field has not been summed, and if SUBTOTAL is not marked on the same line as eject, an X under EJECT is ignored.

If you specify EJECT for two subtotals, a page is ejected after the first subtotal and after the second subtotal.

Dscend: If you want to sort a field in descending order, enter X under DSCEND after the field name. If you do not mark DSCEND, all fields are sorted in ascending sequence.

For key-sequenced files, a X is displayed under DSCEND for each field for which DDS specifies sorting in descending sequence.

If a query application contains more than one record format, sort fields in the same relative position within different record formats must all be sorted into ascending sequence or must all be sorted into descending sequence.

Sort fields are in the same relative position if they have the same name, data type, length, and number of decimal positions. You can review field data types, lengths, and numbers of decimal positions by pressing the Review Application Fields key or the Review DDS key.

Absnbr: If you want a numeric field sorted by its absolute value, enter X in this column after the field name. Otherwise, the field is sorted as a signed numeric field.

If a query application contains more than one record format, sort fields in the same relative position within different record formats must all be sorted as signed numeric fields or must all be sorted by absolute value.

Sort fields are in the same relative position if they have the same name, data type, length, and number of decimal positions. You can review field data types, lengths, and numbers of decimal positions by pressing the Review Application Fields key or the Review DDS key.

+ (Plus Sign): If a plus sign (+) appears in the lower right corner of the sort specification prompt, you can continue the prompt in another display by pressing the Roll ↑ (Roll Up) key. If you do continue the prompt, either the display that appears shows more sort fields and options that were selected or specified previously, or the display shows blank lines so that you can specify additional sort fields and options.

End Interactive Definition

When you press the Enter/Rec Adv key at the last definition prompt, query ends the definition prompting sequence by displaying the exit application definition menu. Query will also display the exit application definition menu if you press the CF1 (Exit) key at any definition prompt following the field review prompt.

Exit Application Definition Menu

Query displays the exit application definition menu when you have completed the interactive prompts. If you have responded to all prompts necessary to complete the definition of a query application, query displays all six options on the exit application definition menu. Option 6, Create application in batch is the default. If errors in the definition of the query application prevent the creation of an executable application, query does not display option 5, Create application interactively, or option 6, Create application in batch. Option 4, Save definition, is the default in this case. If you use the function limiting commands CHGQRYDEF (Change Query Definition) or CRTQRYDEF (Create Query Definition) and the application definition is complete and free of errors, query does not display option 6 and fills in option 5 as default. Select one of the options.

EXIT APPLICATION DEFINITION MENU

Select one of the following:

1. Restart definition
2. Modify definition
3. Delete definition
4. Save definition
5. Create application interactively
6. Create application in batch

Option: 6

The options available to you on this menu are:

1. *Restart definition:* This option indicates that you want to remove all values from the definition and restart the definition, beginning with the query create prompt. If you were changing an existing application, remove all changes and restart the definition beginning with the query change prompt.

2. *Modify definition:* This option indicates that you want to display the query modify menu.

3. *Delete definition:* This option indicates that you want to delete this definition (or the changes you have just entered if you were changing an application).

Note: If you are exiting from an application after entering changes to that application, option 3 will be displayed as: Delete changes to definition. If you select this option while exiting modify mode, only those modifications that you have specified are deleted, and not the entire application.

4. *Save definition:* This option indicates that you want to save this definition and do not want to create an application. Query then displays the save application prompt.

5. *Create application interactively:* This option indicates that you want to create a query application and wait for creation to be complete before using your work station for other tasks. Query then displays the application creation prompt.

6. *Create application in batch:* This option indicates that you want to create a query application by submitting a batch job. Query then displays the application creation prompt. You can use your work station for other tasks after query saves the application definition.

Save Application Prompt

If you selected option 4, Save definition, from the exit application definition menu, the save application prompt is displayed.

SAVE APPLICATION PROMPT

Enter the following:

Application name:	<u>ORDERS</u>
Library name:	<u>QGPL</u>
Public authority:	<u>1</u> (1-Normal 2-None 3-All)
Adopt owner's user profile:	<u>N</u> (Y-Yes N-No)
Source listing:	<u>N</u> (Y-Yes N-No)

An explanation of this display follows:

Application name: Query has filled in the 10-character name of the application specified on the query create/change menu. You may change it.

Library name: Query has filled in the name of the library, specified on the query create/change menu, where the application definition will be saved. You may change it.

Note: If you are saving the definition of a new application based on the definition of an existing application, change the Application name or Library name before pressing the Enter/Rec Adv key. By doing this you do not have to delete the original application.

Public Authority: Specifies how much authority over the application is extended to all system users. 1—Normal (default) specifies that all system users can use the application, but all users cannot delete the application. 2—None specifies that only the application owner can access and use this application. 3—All specifies that all system users have complete authority over the application.

Adopt owner's user profile: You accept the default of No, which specifies that you want to create this application to execute under the user profile of the person executing it, and not your own. Yes specifies that you want to create this application under the user profile of the application owner.

Source listing: No (default) specifies that you do not want the UDS form of this definition to be printed. Yes specifies that you want the UDS printed.

Application Creation Prompt

If you accept option 6, Create application in batch, or choose option 5, Create application interactively, on the exit application definition menu, query displays the application creation prompt.

APPLICATION CREATION PROMPT

Enter the following:

Application name:	<u>ORDERS</u>
Library name:	<u>QGPL</u>
Public authority:	<u>1</u> (1-Normal 2-None 3-All)
Adopt owner's user profile:	<u>N</u> (Y-Yes N-No)
Source listing:	<u>N</u> (Y-Yes N-No)
Dump internal data areas:	<u>N</u> (Y-Yes N-No)
Generate code listing:	<u>N</u> (Y-Yes N-No)
Job description name:	<u>*</u> (*-Job description list)
Library name:	<u>*LIBL</u>
Execution following creation:	<u>Y</u> (Y-Yes N-No)

An explanation of this display follows:

Application name: Query has filled in the 10-character name of the application. You may change it.

Library name: Query has filled in the name of the library where the application exists. You may change it.

Note: If you are creating a new application based on the definition of an existing application, change the Application name or Library name. By doing this you do not have to delete the original application.

Public Authority: Specifies how much authority over the defined application is extended to all system users. 1—Normal (default) specifies that all system users can use the application, but all users cannot delete the application. 2—None specifies that only the application owner can access and use this application. 3—All specifies that all system users have complete authority over the application.

Adopt owner's user profile: You accept the default of No, which specifies that you want to create this application to execute under the user profile of the person executing it, and not your own. Yes specifies that you want to create this application under the user profile of the application owner.

Source listing: No (default) specifies that you do not want the UDS form of this definition to be printed. Yes specifies that you want the UDS printed.

Dump internal data areas: No (default) specifies that you do not want to print the application program template. Yes specifies that you want to print the application program template. An example of doing this would be to gather information in preparation of submitting an APAR. This is meaningful only if you specified *YES for Generated code listing.

Generated code listing: *NO (default) specifies that you do not want an IRP (symbolic intermediate representation of a program) listing of this application. *YES specifies that you do want an IRP listing of this application. IRP, which is an intermediate representation of a program that is produced by query, is discussed in Appendix B.

Note: The following fields appear on the application creation prompt only if option 6, Create application in batch, was accepted on the exit application definition menu.

Job description name: Query displays the name of the job description last used to submit a query job under your user profile (or the user profile you are signed on with). You can change this if you prefer another job description. If you specify a generic name, query will display a job description selection list. If a query job has not been submitted before under your present user profile, query displays an asterisk in this field. See *Using Selection Lists in Chapter 2*.

Library name: Query displays the name of the library containing the job description last used to submit a query job under the user profile you are using. If this field is blank, query defaults to the library list. If *ALL OR *ALLUSR is specified, query displays the job description selection list. *ALL includes all libraries in the system. *ALLUSR includes all user defined libraries and library QGPL. See *Using Selection Lists in Chapter 2*.

Execution following creation: You accept the default of Yes, which specifies that you want to execute this application as soon as it is created. A single query job will be submitted to create and execute the application. No specifies that you only want to submit a query job to create the application.

Press the Enter Rec/Adv key. Query displays the message.

Query application definition being saved.

Query then returns you to the query create/change menu.

Job Description Selection List

If you specified a generic name for the job description name, or *ALL or *ALLUSR for the Library name, in the previous prompt, query displays the job description selection list. See *Using Selection Lists* in Chapter 2 for an explanation of the selection criteria that query uses in producing this selection list.

This display of job descriptions is sorted by job description name and library.
The two IBM-supplied job descriptions are shown in the following display:

JOB DESCRIPTION SELECTION LIST		
NAME	LIBRARY	DESCRIPTION
<u>1</u> QIDUJOB1	QIDU	Normal priority
- QIDUJOB2	QIDU	Low priority

1-Select 2-Display job description CF2-Previous display

An explanation of this display follows:

1. *Select*: Key in a 1 before the job description name you want to create and/or execute your query application with and press the Enter/Rec Adv key.
2. *Display job description*: Key in a 2 before the job description name you want to display information about and press the Enter/Rec Adv key.

Press the CF1 key to return to the exit application definition menu.
Press the CF2 key to return to the application creation prompt.
Press the CF6 key to display any work station messages.
Press the CF7 key to display the query activity log display.

Errors

In a Single Prompt: If an error message is displayed after you respond to a prompt, you can correct the error by changing the response(s) displayed above the error message and pressing the Enter/Rec Adv key. Depending on which message is displayed, you may have to press the Error Reset key before you can change the displayed response(s).

In an Entire Definition: When you press the Exit (CF1) key or reach the exit application definition menu through the prompting sequence, query checks your entire definition for errors. If query finds errors in your definition, an error message describing the first error is displayed on the exit application definition menu. Options 4 and 5 may not be available, depending on the severity of the errors existing in the definition.

You can correct an error immediately by first selecting option 2 on the exit application definition menu, and then modifying the prompt(s) that contain the error. Press the Exit (CF1) key after you correct the error. Query again checks the definition for errors.

If a definition contains several errors, you can press the Roll ↑ (Roll Up) key to see all error messages before you begin to correct errors. The presence of more errors is indicated by a plus sign (+) in the lower right corner of the exit application definition menu.

If you do not want to correct the errors in a definition at the time you complete the definition, you can save the definition and either enter the DSNQRYAPP command or select option 2 from the programmer menu later to change the responses that contain errors.

CHANGING A QUERY

You can change an existing query application by entering the DSNQRYAPP command and selecting option 1, create or change a query, from the query menu. Query then displays the query create/change menu.

Note: The DSNQRYAPP (Design Query Application) command is used throughout this publication. It is possible that you are authorized to use the function limiting commands CHGQRYDEF (Change Query Definition) and CRTQRYDEF (Create Query Definition) instead of the DSNQRYAPP command. See *Chapter 10* for differences in the prompting sequence when these commands are used.

Query Create/Change Menu

If you selected option 1, create or change a query, from the query menu, query displays the query create/change menu. You can use this menu to display information about a query, create a new query, change an existing query, delete an existing query, or display the status of queries submitted.

```

                                QUERY CREATE/CHANGE MENU

Select one of the following and enter values below:
  1. Display information about a query
  2. Create a new query
  3. Change an existing query
  4. Delete an existing query
  5. Display status of queries submitted

Option:                -
Query name:            * _____  (*-Query selection list)
Library name:          _____

HELP-Help   CF2-Previous display
```

The options are:

1. *Display information about a query:* This option requests the query information display, which lists detailed information about the query you specify.

2. *Create a new query:* This option begins an interactive prompting sequence to create a new query. If you select this option, query displays the query create prompt so you can supply the file to be queried and a description of the query.

3. *Change an existing query:* This option begins an interactive prompting sequence to change an existing query. If you select this option, query displays the query change prompt for the query that you want to change.

4. *Delete an existing query:* This option deletes an existing query. Before the actual deletion of the query occurs, query displays the deleted query confirmation display so you can view a description of the query that you are deleting.

5. *Display status of queries submitted:* This option displays the status of jobs submitted to create and/or execute query applications with the user profile that you are now using. Query displays the name, date and time of submission, and the status of the jobs on the query creation/execution status display.

Press the CF1 or CF2 key to return to the query menu.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log display.

Query Change Prompt

If you selected option 3, Change an existing query, from the query create/change menu, query displays the query change prompt.

```

                                QUERY CHANGE PROMPT
Query name:          ORDERS6          Library:      MYLIB
Enter changes, if any:
Description:        Order_status
File name:          QORDERS          (*-File selection list)
Library name:       QIDU

```

HELP=Help CF2-Previous display CF3-File information

An explanation of this prompt follows:

Query name: This is the name of the existing query you want to change. Query has supplied the name you specified on the create/change menu and you are not able to key into this field.

Library: This is the library containing the query. Query has supplied the name you specified on the create/change menu and you are not able to key into this field.

Description: You can change the description (up to 50 characters) of the query you are changing. This field is already filled in but you may want to change it.

File name: This is the file that you want to query. If you have supplied a generic name for this file, query displays the file selection list so you can select a file. Once you have specified a file name, you can press the CF3 key to display the file information menu for the file you specified.

Library name: This is the library containing the file you want to query. If you do not specify a library, query will use the library search list (*LIBL) to find the library containing the file you want to query.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the query create/change menu.

Press the CF3 key to display the file information menu for the file specified on this display.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Interactive Change

If you are authorized to view and change the definition of a query application, you can use the following procedure to change the application interactively:

Action	Description	Reference
1. Display the query modify menu.	<ul style="list-style-type: none"> If you are in the process of creating a new definition: <ul style="list-style-type: none"> Press the Exit (CF1) key and choose option 2 on the exit application definition menu. If you have not requested the query utility, enter the DSNQRYAPP command and specify options 1 and 3. 	<ul style="list-style-type: none"> The Exit (CF1) key is described in Chapter 4. The DSNQRYAPP command is described in Chapter 10.
2. Choose an option on the query modify menu.	Depending on where you want to begin entering changes, select one of the nine definition prompts named by the options on the query modify menu.	The query modify menu is shown in this chapter.
3. Review and change values in the definition.	<ul style="list-style-type: none"> Add, change, or delete values displayed in the definition prompts. Use the Enter/Rec Adv key or any combination of the following keys to change values in the definition: Add After, Add Before, Advance, and Delete. 	The Add After, Add Before, Advance, and Delete keys are described in Chapter 4.
4. Complete the modification.	<ul style="list-style-type: none"> If you are changing an existing definition, press the Exit (CF1) key to display the exit application definition menu. If you have more changes to make, choose option 2 on the menu and return to step 2, above. 	The Exit (CF1) key is described in Chapter 4.
5. Save the definition or create an application from the definition.	<ul style="list-style-type: none"> To save the definition, choose the <i>Save definition</i> option on the exit application definition menu. To create an application from the definition, choose either the <i>Create application in batch</i> or <i>Create application interactively</i> option on the exit application definition menu. 	The exit application definition menu is described in this chapter.

Note: If you are using the CHGQRYDEF (Change Query Definition) command, the above procedure will apply with minor differences. See Chapter 10.

HOW TO USE THE QUERY MODIFY MENU

If you are authorized to view and change the definition of a query application, you can use the query modify menu to access and add, change, or delete the prompts in an existing query definition. The following sections describe the prompts that can be accessed with each option on the query modify menu and the system function control keys and the query command function keys that can be used with each option.

Before you work with the query modify menu, you should be familiar with all query prompts and you should know the locations of the function control and command function keys on your keyboard. Also, note the following:

- You *cannot* access the query definition prompt through the query modify menu except when you want to add another record format and you specify option 4, *Add record format*. However, you can modify fields on the query definition prompt through other prompts. For example, you can access the sort specification prompt (which corresponds to SORT on the query definition prompt) through the query modify menu.
- To return to the query modify menu when you are in the process of adding, changing, or deleting prompts:
 - Press the Advance (CF10) or Enter/Rec Adv key until you get to the end of all prompts associated with a particular option. The query modify menu is then displayed.
- When you enter the DSNQRYAPP command and select those menu selections that place you in modify mode, the query modify menu is displayed.
- The Add After, Add Before, and Delete/Change Owner key are valid only when you are modifying a definition.
- When you are in the process of creating a new definition, you can enter modify mode from any prompt except the file review and field review prompts.
- The Help key allows you to view either (1) the help text associated with any of the prompts except the compute processing prompt and the query modify menu or (2) the second-level message text if an error message is displayed.
- You can use the Review DDS (CF15) key to review the record format names in your query application.
- If you access a default prompt through the query modify menu and you decide not to enter any values on the prompt, press the Advance (CF10) key, not the Enter/Rec Adv key. If you press the Enter/Rec Adv key, you will enter a prompt full of blank fields, which causes an error.

Depending on where you want to begin entering changes, select one of the nine definition prompts named by the options on the query modify menu:

```

                                QUERY MODIFY MENU

Select one of the following:
  1. Output specification          6. Compute processing
  2. Record sampling              7. Select/omit processing
  3. Delete record format         8. Table definition
  4. Add record format            9. Sort specification
  5. Field definition

Option:
Qualifying record format name:  1
Add/delete record format name: ORDHDR

```

You can enter modify mode in two ways. One way to enter modify mode is to:

- Enter the DSNQRYAPP command.
- Select option 1, Design a new query or change an existing one, from the query menu. Press the Enter/Rec Adv key.
- Select option 3, Change an existing query, from the query create/change menu, and fill in the name of the query you want to change. Press the Enter/Rec Adv key.
- Enter any changes that you want to make to the query and press the Enter/Rec Adv key.

You can also enter modify mode when completing a definition, but before exiting from that definition process. You can:

- Select option 2, Modify definition, on the exit application definition menu. Query will then display the modify menu with the name of the first record format filled in.
 - Select option 4 to add another format.
 - Select any of options 5 through 9 to change prompts within a record format.
 - Select option 3 to delete or add a record format.

Displaying the query modify menu is the first step to take if you want to modify the definition of a query application.

After you key in an option number on the modify menu, press the Enter/Rec Adv key. Query then displays the prompt you selected.

Use the Add After, Add Before, Advance, and Delete/Change Owner keys to change the query prompts. Changes you make to the prompts are reflected in the application definition. End the modification process by pressing the Exit (CF1) key.

Note: Do not try to reconstruct data description specification values on a sort specification prompt. If you want to discard a sort order that you specified for a key-sequenced file, blank out the sort selection that you specified. Query then substitutes the order defined by the data description specifications.

Options 1 and 2: Output Specification and Record Sampling

To access the output specification prompt, press the Enter/Rec Adv key. (Query displays 1 in the *Option* field when you sign on because the output specification prompt is the default prompt.)

To access the record sampling prompt, specify option 2 on the query modify menu and press the Enter/Rec Adv key.

You do not have to specify the qualifying record format name on the query modify menu for options 1 and 2 because the output specification and record sampling prompts apply to all record formats in a particular application.

If your application does not contain an output specification or a record sampling prompt, and you specify option 1 or option 2, a default output specification or record sampling prompt, respectively, is displayed. Make the desired changes on the default prompt, and press the Enter/Rec Adv key. Query makes the changes and redisplay the query modify menu.

You can use the following keys with the output specification and record sampling prompts:

Delete	Allows you to return fields on the prompts to their default values. Access the output specification or record sampling prompt and press the Delete/Change Owner (CF11) key; the default values are restored and the query modify menu is redisplayed. (The illustrations of the prompts in Chapter 5 show the default values.)
Enter/Rec Adv	Allows you to change the values on the prompts. Make the desired changes and press the Enter/Rec Adv key; the query modify menu is redisplayed.

Example: Changing an Output Specification Prompt

Suppose that you have added more fields to the definition of your application or you have created a larger table and you want to ensure that the additional fields or the additional parts of the table are included in your printed report. To do this, you must increase the *Output line width* field on the output specification prompt.

1. Display the query modify menu:

```

                                QUERY MODIFY MENU

Select one of the following:
  1. Output specification          6. Compute processing
  2. Record sampling              7. Select/omit processing
  3. Delete record format         8. Table definition
  4. Add record format            9. Sort specification
  5. Field definition

Option:
Qualifying record format name:  1
                               ORDHDR
Add/delete record format name:  _____

```

Leave 1 here to view the existing responses to the output specification prompt.

You do not need to specify the qualifying record format name because there is only one output specification prompt for each application.

2. Press the Enter/Rec Adv key. Query displays the output specification prompt.

OUTPUT SPECIFICATION PROMPT

Enter the following:

Cover page: Customer Orders

Page heading: Order File Query

Detail listing: *NO Detail list double spaced: *NO
Output line width: 132 Separate record format headings: *YES

Change this entry to 264.

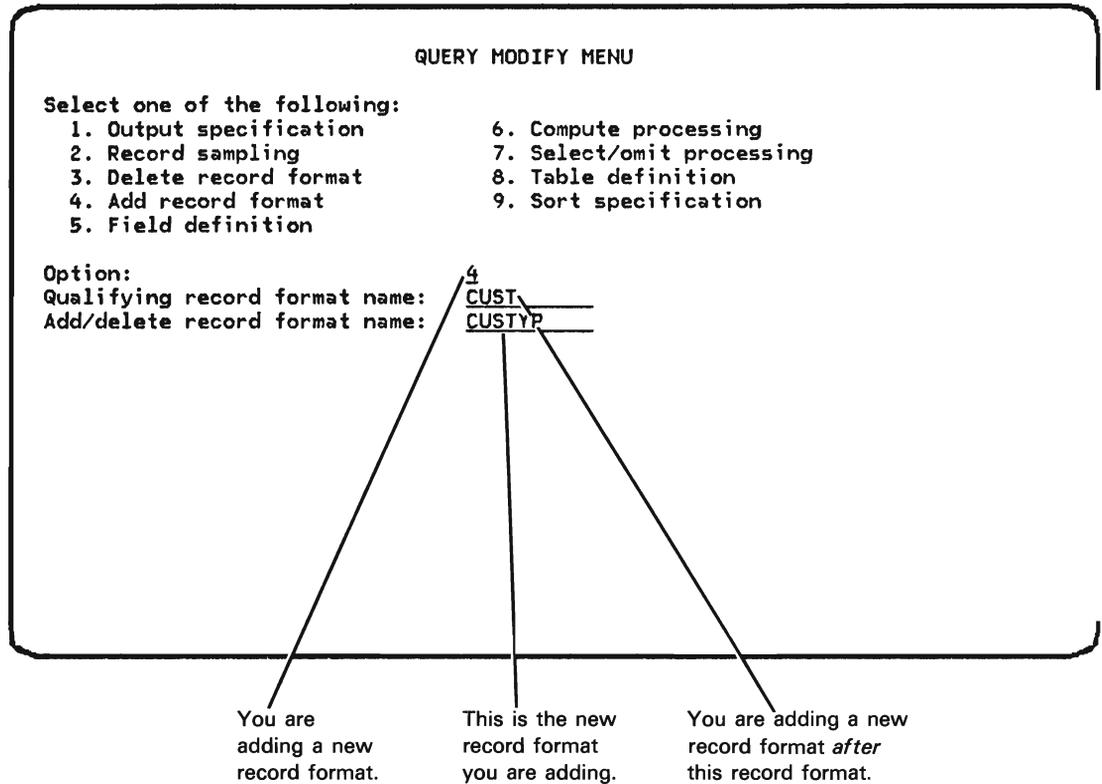
3. Key in any changes and press the Enter/Rec Adv key to enter the changes to the output specification prompt. Query then displays the query modify menu.
4. You can further change the definition of your application by specifying another option on the query modify menu and pressing the Enter/Rec Adv key, or you can press the Exit (CF1) key to display the exit application definition menu.

Option 3: Delete Record Format

To delete a defined record format: (1) specify option 3 on the query modify menu, (2) key in the name of the record format that you want to delete in the *Add/delete record format name* field, and (3) press the Enter/Rec Adv key. Query deletes all prompts relating to the record format from the definition and redisplay the query modify menu. If at a later time you want to know the name of a record format that you deleted, press the Review DDS (CF15) key. If you want to know the names of the record formats that remain in the definition, press the Review Application Fields (CF14) key.

Option 4: Add Record Format

To add a new record format to a definition: (1) specify option 4 on the query modify menu, (2) key in the name of the record format that will precede the new record format in the *Qualifying record format name* field, (3) key in the name of the new record format in the *Add/delete record format name* field, and (4) press the Enter/Rec Adv key.



Both the qualifying and new record formats must exist in your data file; use the Review DDS (CF15) key to ensure this. The qualifying record format must exist in your definition, but the new record format must not; use the Review Application Fields (CF14) key to ensure this.

Before you add a record format, use the Review DDS (CF15) key to check the attributes of the fields in the format. For example, you can specify SUM and AVG for numeric fields only, and if you sort records, the key fields in different record formats must be compatible (same length and type).

After you press the Enter/Rec Adv key, query displays the first prompt (query definition prompt) for the new record format. After you respond to the query definition prompt, press the Enter/Rec Adv key. Prompts are then displayed in the same order as though you were creating a definition. After you respond to each prompt, press the Enter/Rec Adv key. When the last of the prompts is displayed, the query modify menu is redisplayed.

Option 5: Field Definition

This option allows you to access and change the extended list prompt for each field that is specified in the query definition prompt(s). The changes that you can make on the extended list prompt relate to the ORDER, SUM, AVG, and XLIST columns on the query definition prompt(s). To add, change, or delete result fields, use option 6 on the query modify menu.

To access the extended list prompt(s) for a particular record format: (1) specify option 5 on the query modify menu, (2) accept the name of the record format that contains the field(s) you want to modify in the *Qualifying record format name* field, and (3) press the Enter/Rec Adv key. Query displays an extended list prompt.

The extended list prompts appear in the sequence in which the fields are specified on the query definition prompt under the ORDER column; fields with blank or 0 under ORDER appear first. After the last extended list prompt is displayed, the query modify menu is redisplayed.

If you specify option 5 and there are no fields specified for your application, query displays an extended list prompt with a blank field name. Key in the desired values and press the Enter/Rec Adv key.

You cannot add an extended list prompt to a definition by changing the FIELD field and pressing the Enter/Rec Adv key. Instead, use one of the Add keys. If you want both to add and delete an extended list prompt, you must do it in two separate operations: use one of the Add keys to add an extended list prompt and use the Delete/Change Owner (CF11) key to delete an extended list prompt.

You can use the following keys with the extended list prompt(s):

Add After Allow you to add a new extended list prompt to your
Add Before application once you have accessed an extended list
prompt. For example, assume you have accessed the
following extended list prompt:

EXTENDED LIST PROMPT FOR FIELD CUSTYP

Enter the following:

LIST:	<u>*YES</u>
SUM:	<u>*NO</u>
AVG:	<u>*NO</u>
List only if change:	<u>*NO</u>
Label:	<u>CUSTOMER</u> <u>TYPE</u>

Default spacing: *YES If *NO, enter number of spaces: 2
Edit code: J

Enter the values for the new extended list prompt on the original extended list prompt.

EXTENDED LIST PROMPT FOR FIELD ACTMTH

Enter the following:

LIST:	<u>*YES</u>
SUM:	<u>*NO</u>
AVG:	<u>*NO</u>
List only if change:	<u>*NO</u>
Label:	<u>ACCTG</u> <u>MTH</u>

Default spacing: *YES If *NO, enter number of spaces: 2
Edit code: J

If you want the label of the new field to be the same as it is in the data description specifications, specify *SAME in the first line of the *Label* field. For a description of values that you can enter for this and other fields on the extended list prompt, see *Extended List Prompt* in this chapter.

To place the new prompt after the original prompt, press the Add After (CF9) key. To place the new prompt before the original prompt, press the Add Before (CF8) key. The new prompt is created and is placed either after or before the original prompt. The original prompt remains in the definition unchanged, and the new prompt remains displayed. Thus, in the preceding example, the second prompt remains displayed.

If you press the Add After (CF9) key and then press the Enter/Rec Adv key, query either displays the next extended list prompt (if one exists) after the original prompt or redisplay the query modify menu (if there are no more extended list prompts). If you press the Add Before (CF8) key and then press the Enter/Rec Adv key, query displays the original prompt.

- | | |
|-------------------------|--|
| Delete/
Change Owner | Allows you to delete an extended list prompt from an existing definition. Access the extended list prompt that you want to delete and press the Delete/Change Owner (CF11) key; the extended list prompt is deleted, and query either displays the next extended list prompt or displays the query modify menu if the last extended list prompt has been displayed. |
| Enter/Rec Adv | Allows you to change any value on the extended list prompt(s) except for FIELD, or allows you to enter values on a blank extended list prompt(s). Make the desired changes and press the Enter/Rec Adv key; the changes are made and query either displays the next extended list prompt or the query modify menu redisplay if the last extended list prompt has been displayed. |

Option 6: Compute Processing

This option allows you to add, change, or delete result fields in your definition. You can do this through the compute processing prompt.

To access the compute processing prompt(s) for a particular record format: (1) specify option 6 on the query modify menu, (2) specify the name of the record format that contains the result fields that you want to add, change, or delete in the *Qualifying record format name* field, and (3) press the Enter/Rec Adv key. Query displays a compute processing prompt.

You can use the following keys with the compute processing prompt. Note the following before you use these keys:

- You must define a new result field on a compute processing prompt before you refer to it on other prompts.
- Before you delete a result field using the compute processing prompt, you must remove all references to the field from other prompts. For example, you can use option 5 and the Delete/Change Owner (CF11) key to delete the extended list prompt for a result field.

Add After	Allow you to add a new result field to an existing
Add Before	definition once you have accessed a compute processing prompt.

Enter the values for the new result field on an existing compute processing prompt. To place the new prompt after the original prompt, press the Add After (CF9) key. To place the new prompt before the original prompt, press the Add Before (CF8) key. The new prompt is created and is placed either after or before the original prompt. The original prompt remains in the definition unchanged and the new prompt remains displayed.

If you press the Add After (CF9) key and then press the Enter/Rec Adv key, query either displays the next compute processing prompt (if one exists) after the original prompt or redisplay the query modify menu (if there are no more compute processing prompts). If you press the Add Before (CF8) key and then press the Enter/Rec Adv key, query displays the original prompt.

Delete/
Change Owner Allows you to delete a result field from an existing definition. Access the compute processing prompt that names the result field you want to delete and press the Delete/Change Owner (CF11) key; the compute processing prompt is deleted and query either displays the next compute processing prompt or displays the query modify menu if the last compute processing prompt has been displayed.

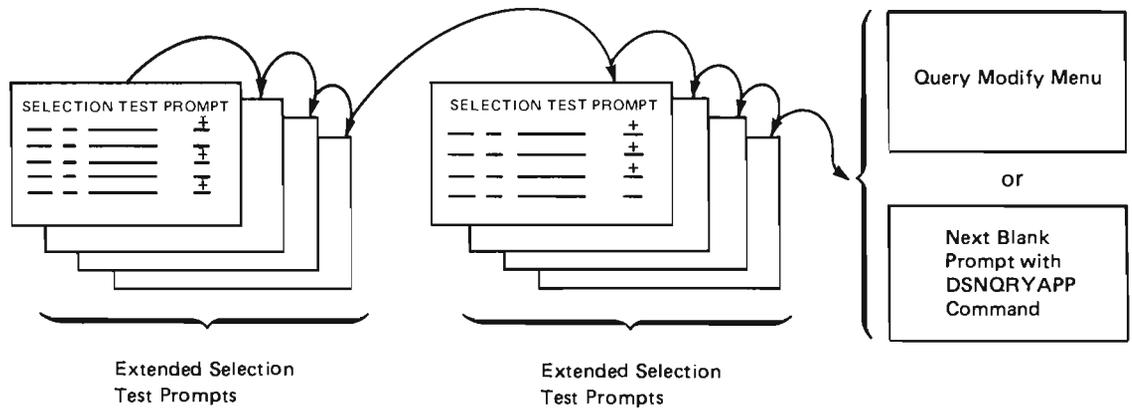
Enter/Rec Adv Allows you to change any value for a result field. Make the desired changes on the compute processing prompt and press the Enter/Rec Adv key: the changes are made, and query either displays the next compute processing prompt or redisplay the modify menu if the last compute processing prompt has been displayed.

You must delete all references to the result field to change the compute expression.

Option 7: Select/Omit Processing

To access one or more selection test prompts and extended selection test prompts associated with a particular record format: (1) specify option 7 on the query modify menu, (2) specify the name of the record format that contains the records to be selected or omitted in the *Qualifying record format name* field, and (3) press the Enter/Rec Adv key. The first selection test prompt appears.

When a definition contains more than one selection test prompt and an associated extended selection test prompt, the order in which the prompts appear when you press the Enter/Rec Adv key is shown below. The extended selection test prompts appear in the order the fields are listed on the selection test prompt.



If you specify option 7 and there is no selection test prompt specified for your application, query displays a selection test prompt with blank field values. Key in the desired values and press the Enter/Rec Adv key.

You can use the following keys with the selection test and extended selection test prompts:

Add After Allow you to add a new selection test prompt to an existing selection test prompt to create a logical OR between the two.
Add Before

Enter the values for the new selection test prompt on the existing selection test prompt. To place the new prompt after the original prompt, press the Add After (CF9) key. To place the new prompt before the original prompt, press the Add Before (CF8) key. The new prompt is created and is placed either after or before the original prompt. The original prompt remains in the definition unchanged, and the new prompt remains displayed.

If there are plus signs (+) on the new selection test prompt, press the Enter/Rec Adv key to access the first of the extended selection test prompts.

The example of option 7 shows how to use the Add Before (CF8) key with selection test prompts.

Advance Allows you to advance from one selection test prompt to another selection test prompt or from an extended selection test prompt to the next selection test prompt, thus bypassing any extended selection test prompts. If you press the Advance (CF10) key and there are no more selection test prompts in your definition, the query modify menu is redisplayed.

**Delete/
Change Owner** Allows you to delete a selection test prompt and any associated extended selection test prompts. When you have accessed the selection test prompt that you want to delete by pressing either the Advance key (CF10) or the Enter/Rec Adv key, press the Delete/Change Owner (CF11) key. The selection test prompt and associated extended selection test prompts are deleted, and the next selection test prompt or the query modify menu is redisplayed.

Enter/Rec
Adv

Allows you to:

- Add, change, or delete any value on a selection test or extended selection test prompt
- Add or delete an entire selection test line
- Add or delete an extended selection test prompt

To add, change, or delete any value on a selection test or extended selection test prompt, make the addition or the change, or blank out the value and press the Enter/Rec Adv key. The addition, change, or deletion is made, and the next prompt is displayed.

To add an entire selection test line, key in the new values on a blank selection test line and press the Enter/Rec Adv key. The selection test line is added (including an extended selection test prompt if a plus sign (+) is entered in the + column), and the next prompt is displayed.

To delete an entire selection test line, blank out either the FIELD NAME or REL value or blank out the entire line and press the Enter/Rec Adv key. The selection test line is deleted (including an extended selection test prompt if the + column contained a plus sign [+]), and the next prompt is displayed.

To delete and add a selection test line at the same time, key in the new values over the existing values and press the Enter/Rec Adv key.

To add an extended selection test prompt for a field, key in a plus sign (+) in the + column and press the Enter/Rec Adv key. The first or new extended selection test prompt is displayed. If the new extended selection test prompt is one of many extended selection test prompts, the prompts appear in the order the fields are listed on the selection test prompt.

To delete an extended selection test prompt for a field, blank out the + column and press the Enter/Rec Adv key. The extended selection test prompt is deleted, and one of the following prompts appears: the first extended selection test prompt (if any remain), the next selection test prompt (if another exists), or the query modify menu. When you delete an extended selected test prompt that has a partial value at the end of a line on the selection test prompt, you must delete the partial value from the selection test prompt before you delete the extended selection test prompt.

Roll ↑
Roll ↓

Allow you to page forward or backward within a group of continued selection test prompts before you press the Add After, Add Before, Advance, Delete/Change Owner, or Enter/Rec Adv key.

Example: Adding to a Selection Test Prompt

The following example shows how to add one selection test prompt before another selection test prompt to create a logical OR. The original application definition contains one selection test prompt that has an associated extended selection test prompt.

1. Display the query modify menu:

QUERY MODIFY MENU

Select one of the following:

1. Output specification	6. Compute processing
2. Record sampling	7. Select/omit processing
3. Delete record format	8. Table definition
4. Add record format	9. Sort specification
5. Field definition	

Option:

Qualifying record format name: Z

Add/delete record format name: SALES

You want to specify additional select/omit processing.

The selection test you want to add is for record format SALES.

4. Press the Add Before (CF8) key. The new selection test is added to the definition of your application before the original selection test prompt. The original test prompt remains in your definition unchanged. The new test is logically ORed to the original test group. (To logically AND tests to an existing test group: specify the tests on blank lines remaining in the existing selection test prompt; if necessary, press the Roll [Roll Up] key to display more blank lines for the prompt so that you can specify more tests for the prompt; and press the Enter/Rec Adv key rather than one of the Add keys.)
5. Query displays the extended selection test prompt for the new selection test:

EXTENDED SELECTION TEST PROMPT

Enter test value:

FIELD NAME	REL	VALUES
CUST	*LS	1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31

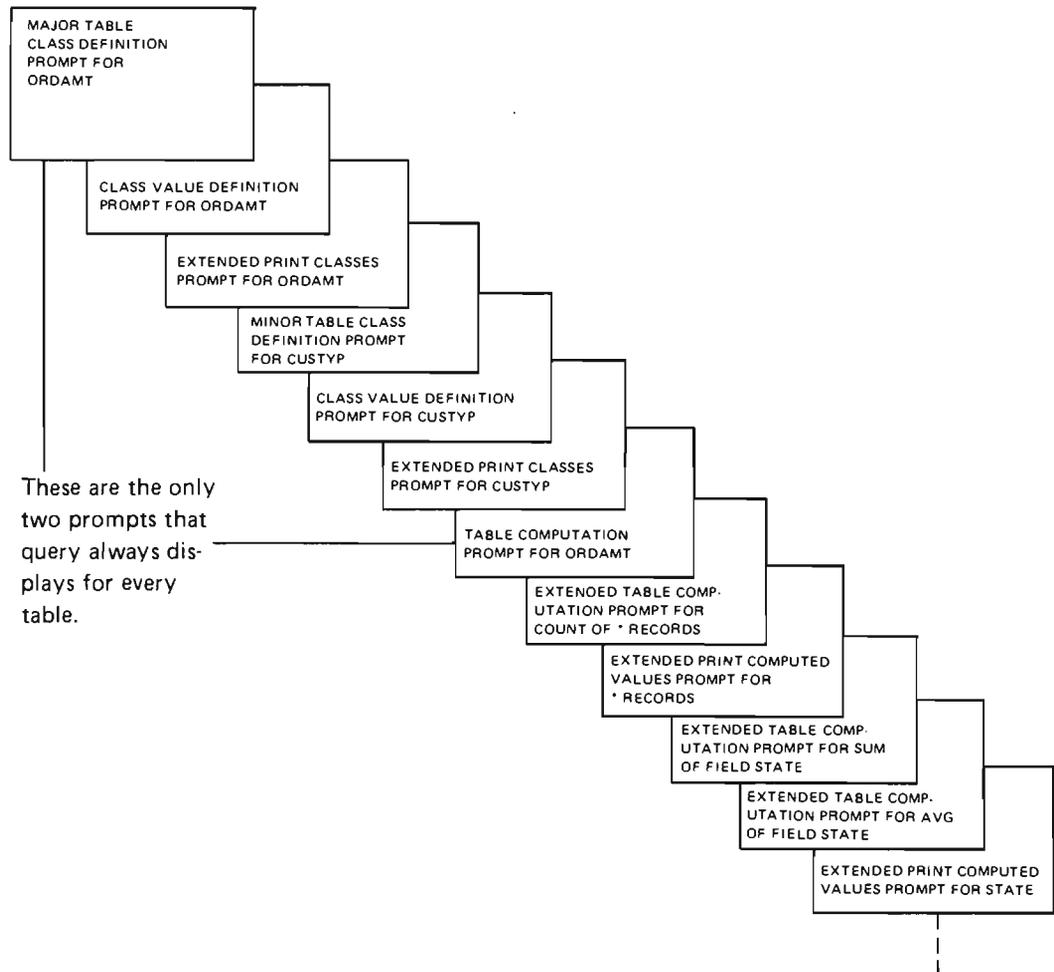
Leave the test values the same because
you want the same values for the new as
the original extended selection test prompt.

6. Press the Enter/Rec Adv key again. Query adds the new extended selection test to the definition of your application and then displays the original selection test prompt.
7. From the original selection test prompt, you can:
 - Press the Enter/Rec Adv key to display the extended selection test prompt associated with the original selection test prompt.
 - Press the Advance (CF10) key to return to the query modify menu.
 - Press the CF1 key to display the exit application definition menu.

Option 8: Table Definition

To access major table class definition prompts and all associated prompts: (1) specify option 8 on the query modify menu, (2) specify the name of the record format that contains the fields from which the table(s) is formed in the *Qualifying record format name* field, and (3) press the Enter/Rec Adv key.

The following illustration shows the order in which query would display the major table class definition prompt and all associated prompts for a table with major class ORDAMT and minor class CUSTYP, if you specified all possible options for a table. However, most tables that you define will probably contain only two, three, or four of the prompts shown.



If your definition does not contain a table and you specify option 8, query displays a default table class definition prompt. Make the desired changes on the default prompt and press the Enter/Rec Adv key. Query makes the changes and displays the next associated prompt.

Major Table Class Definition Prompt

The following keys can be used with a major table class definition prompt:

Add After	Allow you to add a new major table class definition prompt to a definition that already contains one or more tables.
Add Before	

Enter the values for the new major table on any existing major table class definition prompt. To place the new prompt after the original prompt, press the Add After (CF9) key. To place the new prompt before the original prompt, press the Add Before (CF8) key. The new prompt is created and is placed either after or before the original prompt. The original prompt remains in the definition unchanged, and the first associated prompt for the new table is displayed.

To access the prompts associated with the new major table class definition prompt, press the Enter/Rec Adv key. After you have responded to all prompts for the new table, query either displays the major table class definition prompt for the next table (if one exists) or redisplay the query modify menu.

Advance	Allows you to bypass all prompts associated with a table. If you press the Advance (CF10) key from any prompt in a table, query either displays the major table class definition prompt associated with the next table (if one exists) or redisplay the query modify menu.
---------	--

Do not make changes to a major table class definition prompt and then press the Advance (CF10) key. Query will not make the changes. Instead, use the Enter/Rec Adv key.

Delete/ Change Owner	Allows you to delete an entire table (the major table class definition prompt and all associated prompts). (For how to delete certain associated prompts without also deleting the entire table, see the explanation of the Enter/Rec Adv key in this section.)
-------------------------	---

When you have accessed the major table class definition prompt of the table that you want to delete, press the Delete/Change Owner (CF11) key. The major table class definition prompt and all associated prompts are deleted, and query either displays the major table class definition prompt of the following table (if one exists) or redisplay the query modify menu.

Enter/Rec
Adv

Allows you to:

- Change values on a major table class definition prompt
- Advance from a major table class definition prompt to its first associated prompt

Make the desired changes on the prompt and press the Enter/Rec Adv key; the first associated prompt is displayed. Inserting or removing references to associated prompts on a major table class definition prompt either displays or deletes the associated prompts. For example, if your definition does not have a minor table class definition prompt associated with it, and you enter a field name in the *Minor class name* field, query displays a minor table class definition prompt. If your definition does contain a minor table class definition prompt, and you blank out the *Minor class name* field on a major table class definition prompt, query deletes the minor table class definition prompt and all associated prompts.

To enter any changes to a major table class definition prompt and then proceed to its first associated prompt, press the Enter/Rec Adv key.

Associated Prompts

When modifying all prompts associated with a major table class definition prompt, the Add After, Add Before, and Delete/Change Owner keys cannot be used. All prompts associated with a major table class definition prompt must be requested, removed, or deleted by entries on previous existing prompts, as shown in the following chart:

Associated Prompt to be Requested, Removed, or Deleted	Where and How to Request Associated Prompt	Where and How to Remove or Delete Associated Prompt
Minor table class definition prompt	Major table class definition prompt – Specify a field name in <i>Minor class name</i> field.	Major table class definition prompt – Either blank out or change the original <i>Minor class name</i> field; the original minor table class definition prompt and all its associated prompts are deleted.
Class value definition prompt	Major and minor table class definition prompts – Specify <i>Tabulate on values specified in next prompt</i> .	Major and minor table class definition prompts – Blank out the <i>Tabulate on values specified in next prompt</i> field.
Extended print classes prompt	Major and minor table class definition prompts – Specify <i>Extended print prompt: *YES</i> .	Major and minor table class definition prompts – To no longer view the extended print classes prompt, specify <i>Extended print prompt: *NO</i> .
Table computation prompt	Is automatically displayed for each major class field.	Can be deleted only as part of an entire table.
Extended table computation prompt (for COUNT)	Table computation prompt – Specify <i>extended count function: *YES</i> . (Query also displays an extended print computed values prompt for COUNT.)	Table computation prompt – To delete the entire extended table computation prompt, specify <i>*NO</i> in both the <i>Count records</i> and <i>Extended count function</i> fields. – To delete all options on the extended table computation prompt except the first, specify <i>*NO</i> in the <i>Extended count function</i> field.
Extended table computation prompt (for SUM or AVG)	Table computation prompt – Specify X in the XSUM or XAVG column.	Table computation prompt – Blank out the XSUM or XAVG column.
Extended print computed values prompt (for COUNT)	Table computation prompt – Specify <i>extended count function: *YES</i> .	Table computation prompt – To no longer view the extended print computed values prompt, specify <i>extended count function: *NO</i> .
Extended print computed values prompt (for SUM or AVG)	Table computation prompt – Specify X in the XPRINT column.	Table computation prompt – To no longer view the extended print computed values prompt, blank out the XPRINT column.

The following keys can be used with associated prompts:

Advance Allows you to advance from any prompt associated with a major table class definition prompt to either the major table class definition prompt associated with the next table (if one exists) or the query modify menu.

Do not make changes to an associated prompt and then press the Advance key. Query will not make the changes. Instead, use the Enter/Rec Adv key.

Enter/Rec Adv Allows you to:

- Change values on associated prompts, thus requesting or deleting other associated prompts.
- Advance from an associated prompt to the next prompt (which can be another associated prompt, a major table class definition prompt, or the query modify menu).

The associated prompts will contain default values. Respond to each of the associated prompts as though you were creating a new table. After you respond to each associated prompt, press the Enter/Rec Adv key.

To proceed from an associated prompt to the next prompt without entering any changes, press the Enter/Rec Adv key.

Roll ↑
Roll ↓ Allow you to page forward and backward within a group of continued displays. You can use these keys only with the class value definition and table computation prompts before you press the Advance key or the Enter/Rec Adv key.

Example: Adding to an Existing Table

Suppose you have two tables defined for your application, and you want to add to the second table.

1. Display the query modify menu:

QUERY MODIFY MENU

Select one of the following:

1. Output specification	6. Compute processing
2. Record sampling	7. Select/omit processing
3. Delete record format	8. Table definition
4. Add record format	9. Sort specification
5. Field definition	

Option: 8

Qualifying record format name: SALES

Add/delete record format name: _____

You want to modify a table.

The table that you want to modify is for record format SALES.

2. Press the Enter/Rec Adv key to enter your responses to the query modify menu. Query displays the major table class definition prompt for the first table in your definition:

MAJOR TABLE CLASS DEFINITION PROMPT FOR ORDER

Select one of the following by entering X:

- Tabulate on values specified in next prompt
- Tabulate for every value that occurs in the data
- Tabulate into evenly spaced intervals
- Interval size: 10.00
- Default intervals: *YES If *NO, enter value: 10
- Default base value: *YES If *NO, enter value: .00
- Tabulate into evenly populated intervals
- Number of intervals: 10
- Extended print prompt: *NO Minor class name: _____

- Press the Advance (CF10) key to access the major table class definition prompt for the second table in your definition and thus bypass all the other prompts associated with the first table. Query then displays the major table class definition prompt for the second table in your definition:

MAJOR TABLE CLASS DEFINITION PROMPT FOR ORDAMT

Select one of the following by entering X:

- Tabulate on values specified in next prompt
- Tabulate for every value that occurs in the data
- Tabulate into evenly spaced intervals

Interval size: 500.00

Default intervals: *NO If *NO, enter value: 4

Default base value: *NO If *NO, enter value: .00

- Tabulate into evenly populated intervals

Number of intervals: 10

Extended print prompt: *NO Minor class name: CUSTYP

- Suppose that you want an extended sum printed for the second table. Press, and continue pressing, the Enter/Rec Adv key until query displays the table computation prompt for ORDAMT:

TABLE COMPUTATION PROMPT FOR ORDAMT

Enter the following for this table:

Count records: *YES Extended count function: *NO

Table computation fields (optional):

FIELD NAME	ORDER	SUM	AVG	XSUM	XAVG	XPRINT
<u>ORDER</u>	<u>1.0</u>	-	-	-	-	-
<u>ORDSTS</u>	<u>2.0</u>	-	-	-	-	-
<u>ORDAMT</u>	<u>3.0</u>	<u>X</u>	-	<u>X</u>	-	-
<u>CUSTYP</u>	<u>4.0</u>	-	-	-	-	-
<u>OPNSTS</u>	<u>5.0</u>	-	-	-	-	-
<u>TOTLIN</u>	<u>6.0</u>	-	-	-	-	-
<u>INVNUM</u>	<u>7.0</u>	-	-	-	-	-
<u>ACTMTH</u>	<u>8.0</u>	-	-	-	-	-
<u>ACTYR</u>	<u>9.0</u>	-	-	-	-	-
<u> </u>	<u> </u>	-	-	-	-	-
<u> </u>	<u> </u>	-	-	-	-	-
<u> </u>	<u> </u>	-	-	-	-	-
<u> </u>	<u> </u>	-	-	-	-	-

Key in X here to print the sum of ORDAMTs.

Key in X here to request an extended sum for ORDAMTs.

5. Press the Enter/Rec Adv key to enter your response to the table computation prompt. Query then displays the extended table computation prompt:

The X appears here because you specified X under SUM on the table computation prompt.

You want the order amount classes ranked by the sum in each class.

EXTENDED TABLE COMPUTATION PROMPT FOR SUM

Select one or more of the following for field ORDAMT

- Print the computed number
- Print the rank of the number (low number is rank 1)
- Print the rank of the number (high number is rank 1)
- Order the printing by the rank of the number (low first)
- Order the printing by the rank of the number (high first)
- Print a cumulative number
- Print the number as a percentage
- Print the cumulative number as a percentage

6. Press the Enter/Rec Adv key to enter your response to the extended table computation prompt. Query then displays the query modify menu because the extended table computation prompt was the last prompt for the last table in your definition.
7. From the query modify menu, you can further change the definition of your application by specifying an option on the query modify menu and pressing the Enter/Rec Adv key, or you can press the Exit (CF1) key to display the exit application definition menu.

Option 9: Sort Specification

To access a defined sort prompt: (1) specify option 9 on the query modify menu, (2) specify the name of the record format that contains the records to be sorted in the *Qualifying record format name* field, and (3) press the Enter/Rec Adv key.

If you specify option 9 and there is no sort specification prompt specified for your application, or if you have not defined key fields for the record format in the data description specifications for the file, query displays a blank sort specification prompt.

You can use the following keys with the sort specification prompt:

Enter/Rec Adv Allows you to:

- Change the values on the prompt
- Add or delete a sort key
- Restore the prompt to the sort values originally specified in the data description specifications for the file

To change values on the prompt, key in the changes. To delete a sort key, blank out the FIELD or ORDER field, or blank out an entire line. Add new sort keys and values on empty lines. To restore a prompt to the values originally specified in DDS, blank out all lines on the prompt.

After you have made all your changes on the prompt, press the Enter/Rec Adv key. If you are changing a definition, the query modify menu is redisplayed. If you are creating a definition, the next blank prompt is displayed.

Roll ↑

Roll ↓

Allow you to page forward or backward within a group of continued selection test prompts before you press the Enter/Rec Adv key.

Adding a Field to an Existing Definition

You can add a field to an existing query definition and create a new query application containing that field in two ways. The field(s) to be added must be keyed in with the names as they exist in the DDS. You can add a field to a query definition as follows:

- You can add a new field to an existing definition by selecting option 5, Field definition, on the query modify menu. Query then displays the extended list prompt. Use the Enter/Rec Adv key to look through the existing fields in the definition to locate the position where you want to insert the added field. Key in the field name (as it is in the DDS). Press the Add Before or Add After keys to place the field where you want it in the definition, and in the resulting query report listing. Any other options of list, sum, avg, or labeling can also be specified for the added field at this time. You must delete the original query application before attempting to replace it with the new query application.
- You can delete the existing application and redefine the definition to include any new fields that you want in your new query application.

Example

To add a field(s) to an existing application, proceed as follows:

Display the query modify menu.

QUERY MODIFY MENU	
Select one of the following:	
1. Output specification	6. Compute processing
2. Record sampling	7. Select/omit processing
3. Delete record format	8. Table definition
4. Add record format	9. Sort specification
5. Field definition	
Option:	<u>5</u>
Qualifying record format name:	<u>ORDHDR</u>
Add/delete record format name:	<u> </u>

Complete the query modify menu by entering:

- Option 5, Field definition to display the extended list prompt.
- The qualifying record format name is ORDHDR.

Press the Enter/Rec Adv key.

The Add/delete record format name prompt does not need to be filled in to add a field to a definition.

Query then displays the extended list prompt:

```

                                EXTENDED LIST PROMPT FOR FIELD CUST
Enter the following:
LIST:                               *YES
SUM:                                *NO
AVG:                                *NO
List only if change:                *NO
Label:                               CUSTOMER
                                      NUMBER
Default spacing:                    *YES      If *NO, enter number of spaces: 2
Edit code:                           —
```

Press the Enter/Rec Adv key to display each field in the existing application.

Press CF14 to review the fields in the application.

Press CF15 to review the DDS of the file.

When you have found the location in which you want to add a new field(s), key in the new field name (as it exists in DDS) on line 1 of this prompt and change the label and any other items, such as list, sum, avg, label, and edit code that you want changed. Press the Add After or Add Before key depending on where you want the field located within the application. Query will modify the existing definition to include this field and special processing items that you have specified in your application.

If you have no further fields to add to the application, press the Enter/Rec Adv key and query will display the query modify menu. If you do not want to make any other modifications to this definition, press the CF1 (Exit) key. Query will display the exit application definition menu. Select option 4 to save your definition, or option 5 to create the new application interactively or option 6 to create the new application in batch.

Chapter 6. How to Delete a Query

If you are authorized to delete a query application, you can delete the application by selecting option 1, create or change a query, from the query menu. Query then displays the query create change menu.

Note: Do not delete an application that contains a definition that you want to use as a basis for a new application. If you want to change an application, select the change option. You are then prompted to delete the application on the create application prompt or the save application prompt if you do not enter a new application name.

If you change the name of the application, you will not delete the application that you have used as a base to define the application you are deleting.

Query Create/Change Menu

You can use this menu to delete a query application. Fill in the name of the query and the library containing it and select option 4 to delete a query application.

QUERY CREATE/CHANGE MENU

Select one of the following and enter values below:

1. Display information about a query
2. Create a new query
3. Change an existing query
4. Delete an existing query
5. Display status of queries submitted

Option: 4

Query name: * _____ (*-Query selection list)

Library name: _____

HELP-Help CF2-Previous display

When you select option 4, query will delete the application. Before the actual deletion of the query application occurs, query displays the delete query confirmation display so you can view a description of the query that you are deleting.

Press the CF1 or CF2 key to return to the query menu.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log display.

Query Selection List Display

If you entered a generic query name of a query on a previous prompt, query displays those queries that satisfy the generic name you specified on the previous display.

You can use this display to view a list of queries that satisfy generic name. The display of queries is shown sorted by query and library.

Only those queries that you are authorized to delete are listed.

QUERY SELECTION LIST			
QUERY	LIBRARY	FILE	DESCRIPTION
- OPEN	MYLIB	QORDERS	Open order status
- ORDERS	MYLIB	QORDERS	Order status
- ORDERS5	MYLIB	QORDERS	Order status
- ORDERS6	MYLIB	QORDERS	Order status

1-Select 2-Query information HELP-Help CF2-Previous display

An explanation of this display follows:

1-Select: Place a 1 in front of the query that you want to delete. Press the Enter/Rec Adv key and query will present the delete query confirmation display.

2-Query information: Place a 2 in front of the query that you want to display more information about. Query then displays the query information display.

Press the CF1 key to return to the query menu.

Press the CF2 key to return you to the query create/change menu.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Delete Query Confirmation Display

If you selected option 4, Delete an existing query, from the query create/change menu, or option 1 on the query selection list, query displays the delete query confirmation display. You can review information about the query you are deleting. If you want to delete the displayed query, press the CF11 key. Query will then return to the query create/change menu or the query selection list.

If you do not want to delete the displayed query, press the Enter/Rec Adv or CF2 key. Query then returns to the query create/change menu or the query selection list.

Note: If you selected more than one query application for deletion (on the query selection list), query displays the delete query confirmation display for the next application after you press the Enter/Rec Adv key or the CF2 key.

DELETE QUERY CONFIRMATION		
Query name:	OPEN	Library: MYLIB
Owner:	SMITH	
Creation date/time:	07/21/81 08:25:09	
File name:	QORDERS	Library: QIDU
Description:	Open order status	

HELP-Help CF2-Previous display CF3-File information
Press CF11 to delete application. Press ENTER or CF2 to retain.

An explanation of this display follows:

Query name: This is the name of the query that you are deleting.

Library: This is the library containing the query you are deleting.

Owner: This is the name of the owner of the query application you are deleting.

Creation date/time: This is the date and time the query was created.

File name: This is the file referenced by the query you are deleting.

Library: This is the library where the referenced file is located.

Description: This is the description of the query you are deleting.

Press the CF1 key to return to the query menu without performing the deletion.

Press the CF2 key to return to the query create/change menu without performing the delete operation.

Press the CF3 key to display the file information menu for the file specified on this display.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Press the CF11 key to perform the delete operation.



Chapter 7. How to Execute a Query

Once you have created your query application you will want to execute it to extract the information you desire from the data base file that you have specified. To execute query, enter the DSNQRYAPP command and query will display the query menu. Select option 2, execute queries and display output, and query will display the query execution and report menu.

QUERY EXECUTION AND REPORT MENU

You can use this menu to select the type of query execution you want, display the status of other queries, or to display the output of the query that has finished executing.

```

                                QUERY EXECUTION AND REPORT MENU

Select one of the following and enter values below:
  1. Display information about a query
  2. Submit a query for execution
  3. Display status of queries submitted
  4. Display output at work station from last execution

Option:                -
Query name:            *_____ (*-Query selection list)
Library name:         _____

HELP-Help   CF2-Previous display
```

The options are:

- 1. Display information about a query:* This option displays information about the query you specify on this menu. Refer to Chapter 5 for a discussion of the query information display.
- 2. Submit a query for execution:* This option submits the query specified in this display for execution. When you select this option, query displays the query execution prompt.

3. *Display status of queries submitted:* This option displays the query creation/execution status display. The query creation/execution status display shows the status of all queries submitted under the user profile you are presently using.

4. *Display output at work station from last execution:* This option displays the output of the last run of the query named if that output is available for display. See *How to Position Displayed Data* in this chapter.

Query name: Query fills in the name of the query application last specified on this display. You can change it. If you specify a generic name, query displays the query selection list. See *Using Selection Lists* in Chapter 2.

Library name: Query fills in the name of the library last specified on this display. You can change it. If this field is blank or contains *LIBL, query uses the library list to find the first occurrence of the query application. If you specify *ALL or *ALLUSR, query displays the query selection list. See *Using Selection Lists* in Chapter 2.

Press the CF1 or CF2 key to return to the query menu.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log display.

How to Position Displayed Data

If you choose option 4, Display output at work station from last execution, on the query execution and report menu, query displays a control field and a scan field with the beginning of the spooled file.

To position data on the display, key in one of the following values in the control field and press the Enter/Rec Adv key:

- E : Query displays the end of the spooled file.
- P+N : Query displays the page of the spooled file that is N pages after the one that is currently displayed. The value P corresponds to P+1.
- P-N : Query displays the page of the spooled file that is N pages before the one that is currently displayed. The value P- corresponds to P-1.
- PN : Query displays the beginning of page N of the spooled file.
- W+N : Query displays the data that begins N positions to the right. The value W corresponds to W+1.
- W-N : Query displays the data that begins N positions to the left. The value W- corresponds to W-1.
- WN : Query displays the data that begins in position N.
- +N : Query displays the data that is N lines or records after the first one currently displayed.
- -N : Query displays the data that is N lines or records before the first one currently displayed.
- N : Query displays the line or record N as the first one on the screen.

You may use the Roll Up and Roll Down keys instead of the control field. When the Roll keys are used, query ignores the control field.

To scan for character strings, key in the character string in the scan field. If the string has ending blanks, enclose the character string with single parentheses. Press the CF7 key to activate scanning. Press the CF7 key repeatedly to find additional occurrences of the string.

When you are finished viewing the output, press the Enter/Rec Adv key with the control and scan fields blank.

Query Execution Prompt

If you selected option 2, Submit a query for execution, from the query execution and report menu, query displays the query execution prompt.

```

                                QUERY EXECUTION PROMPT
Query name:      OPEN           Library:      MYLIB
File name:      QORDERS

Enter information below for execution:
Data base file member: _____ (*-List Blank-First member)
Number of records to query: _____ (Blank-All records)
Forms width:    132             (50 to 198)
Hold output for display: N      (Y-Yes N-No)
Job description: *             (*-Job description list)
Library name:   _____

HELP-Help  CF2-Previous display
```

An explanation of this prompt follows:

Query name: This is the name of the query that you want to execute.

Library: This is the library containing the query.

File name: This is the file that the query is referencing.

Data base file member: This is the file member that you want to query. If you leave this blank, the first member in the file will be queried. If you specify an asterisk(*), query displays the member selection list so you can select a member.

Number of records to query: This is the number of records to be read from the file by query during the first pass over the access path defined in the file.

Forms width: This is the actual width of the forms used in the printer where the report will be printed. If the report is being displayed, then you would specify the display width. The minimum forms width that can be specified is 50; the maximum forms width is 198. For displayed reports, 77 is useful if your display screen has 80 characters per line. The default is 132.

If the output line width you specified on the output specifications prompt is greater than the forms width, query produces a double listing. Query labels the first listing as Part 1 and the second listing as Part 2. Place the listings side by side to produce your report. If there is no folding on the Part 2 listing, the page numbers will match.

Hold output for display: Yes indicates that you want the query output to be held for viewing at a work station. No (the default) indicates that you want the query output placed in a print queue for printing.

Job description name: Query displays the name of the job description last used to submit a query job under your user profile (or the user profile you are signed on with). You can change this if you prefer another job description. If you specify a generic name, query will display a job description selection list. If a query job has not been submitted before under your present user profile, query displays an asterisk in this field.

Note: See Chapter 9, *Additional Topics for Consideration*, for a discussion of how to tailor this list to your needs.

Library name: Query displays the name of the library containing the job description last used to submit a query job under the user profile you are using. If this field is blank, query defaults to the library list. If *ALL or *ALLUSR is specified, query displays the job description selection list. *ALL includes all libraries in the system. *ALLUSR includes all user defined libraries and library QGPL.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the query execution and report menu.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Member Selection List Display

Query lists the members in the file in alphabetical order.

MEMBER SELECTION LIST		
File name:	QORDERS	Library: QIDU
MEMBER NAME	RECORDS	DESCRIPTION
_ QORDERS	1142	Customer order file
1-Select HELP-Help CF2-Previous display		

The option is:

1-Select: Place a 1 in front of the member that you want to select. Press the Enter/Rec Adv key and query will select the member for the requested operation.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the interrupted display.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Job Description Selection List

If you specified a generic name for the Job description name, or, *ALL or *ALLUSR for the Library name, in the query execution prompt, query displays the job description selection list. See *Using Selection Lists* in Chapter 2 for an explanation of the selection criteria used by query in producing this selection list.

The display of job descriptions is sorted by job description name and library. The two IBM-supplied job descriptions are shown in the following display:

JOB DESCRIPTION SELECTION LIST		
NAME	LIBRARY	DESCRIPTION
<u>1</u> QIDUJOB1	QIDU	Normal priority
- QIDUJOB2	QIDU	Low priority

1-Select 2-Display job description CF2-Previous display

An explanation of this display follows:

1 - Select: Key in a 1 before the job description name you want to create and/or execute your query application with and press the Enter/Rec Adv key.

2 - Display job description: Key in a 2 before the job description name you want to display information about and press the Enter/Rec Adv key.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the query execution prompt.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Query Creation/Execution Status Display

Query displays the query creation/execution status display if you select any of:

- Option 3, Display status of queries submitted, on the query execution and report menu.
- Option 5, Display status of queries submitted, on the query create/change menu.

QUERY CREATION/EXECUTION STATUS			
APPLICATION	LIBRARY	WHEN SUBMITTED	STATUS
_ ORDERS	MYLIB	09/23/82 09:22:54	ACTIVE

1-Job information CF5-Redisplay CF12-Group by status

An explanation of this display follows:

Application: This is the name of the query application to be created and/or executed.

Library: This is the name of the library containing the application.

When submitted: This is the date and time the job was submitted to create and/or execute the application. This is in the form:

month/day/year hours:minutes:seconds

Status: This is the status of the job submitted to create and/or execute the application. The status of the job is as of the time you requested the query creation/execution status display or as of the last time you pressed the CF5 (Redisplay) key. Status values are:

- Ended abnormally: The job submitted to create and/or execute the query application failed to execute. An example situation which would produce this status is if the application definition was deleted after the job was submitted but before the job could execute.

- **Completed:** The job submitted to create and/or execute the query application has finished executing.
- **Active:** The job submitted to create and/or execute the query application is executing.
- **Queued:** The job submitted to create and/or execute the query application is awaiting execution.

You can:

- Key in a 1 before the application name and press the Enter/Rec Adv key to display information about the job submitted to create the application.
- Press the CF12 key to reorder the display to group jobs by status. The jobs are then displayed in the following order:
 1. Completed
 2. Active
 3. Queued
 4. Ended abnormally
- Press the CF5 key to update the status for all jobs on the display.
- Press the CF2 key to return to the query create/change menu.
- Press the CF1 key to return to the query menu.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Query Output Menu

If you selected option 4, Display output at work station from last execution, from the query execution and report menu, query displays the beginning of the spooled file. See *How to Position Displayed Data* in this chapter.

After viewing the held output, press the Enter/Rec Adv key with the control and scan fields blank. Query displays the query output menu. Use this menu to hold, print, or delete the output.

QUERY OUTPUT MENU

Select one of the following:

1. Hold the output for later display or printing
2. Release the output for printing
3. Delete the output

Option: _

HELP-Help CF2-Previous display

The options are:

1. *Hold the output for later display or printing:* This option places the output in hold status so you can view your query at a later time.
2. *Release the output for printing:* This option places your query output in the print queue so it can be printed.
3. *Delete the output:* This option deletes your query output.

Press the CF1 key to return to the query menu.

Press the CF2 key to return to the query execution and report menu.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Pressing the Enter/Rec Adv key without keying in an option causes query to leave the output in its current state.

Advantages of Submitting QRYDTA in a Batch Job

You submit your queries for batch execution when you are using the query execution prompt. This prompt is reached through the DSNQRYAPP command. When you submit queries for execution from the command entry display, use the QRYDTA command.

Because all query applications are executed without user interaction, batch entry of the QRYDTA command offers the following advantages over interactive entry of QRYDTA:

- Query automatically submits queries to batch when you use the query execution prompt.
- Work station time is used more efficiently. If QRYDTA is entered interactively, the work station from which it is entered is inoperable from the time the command is entered until the time the report is completed.
- System performance may be enhanced because the request for query execution is placed in the system storage pool for batch jobs.

Location of Output

Execution of a query application may also be requested either by interactive entry of the QRYDTA command or by batch entry of QRYDTA. The OUTPUT parameter in the QRYDTA command determines where output from the query application is presented: either the output is initially displayed at the work station from which QRYDTA is entered and is then spooled for printing, or the output is spooled for printing without being displayed first at a work station. For the names of the query spooled output files, see *Printing of Output* in this chapter.

If you submit a job using the query execution prompt and specify Y for Hold output for display, you can view the output at your work station. You can then hold, release for printing, or delete the output.

Printing of Output

Spooled Files

Note: When you use the query output menu, query performs the CNLSPLF, RLSSPLF, and HLDSPLF commands for you.

All printing of query output is performed by CPF spooling support. The spooled files used by query are:

- QQRXDSP and QQRXDSP2 for output that is initially displayed at a work station. QQRXDSP contains up to the first 196 characters of each print line, and, if required, QQRXDSP2 contains up to the second 196 characters of each print line. QQRXDSP and QQRXDSP2 are not available for printing until you end the job in which you submitted the QRYDTA command.
- QQRYPRT and QQRYPRT2 for output that is printed without being displayed first at a work station. QQRYPRT contains up to the first 196 characters of each print line, and, if required, QQRYPRT2 contains up to the second 196 characters of each print line. QQRYPRT and QQRYPRT2 are available for printing as soon as output is available from a query application.
- QSYSPRT for listings of source UDS statements.

You can display the information in QQRYPRT and QQRYPRT2 after you execute a query application by entering the DSPSPLF (Display Spooled File) command. DSPSPLF and the format of the display it provides are described in the *CL Reference Manual*.

You can cancel the printing of a query report by canceling the query spooled output file(s) that contains the report. To cancel the spooled file(s), enter the CNLSPLF (Cancel Spooled File) command before the report is printed. To cancel a spooled output file that is used by the most recent query job, specify SPLNBR(*LAST) on the CNLSPLF command. The CNLSPLF command is described in the *CL Reference Manual*.

Note: If you want to cancel the printing of a report that has an output line width of 133 or more, you must cancel two spooled output files. Depending on which files are used by the job, cancel QQRXDSP and QQRXDSP2 if you specified OUTPUT(*) on the QRYDTA command, or cancel QQRYPRT and QQRYPRT2 if you specified OUTPUT(*LIST) on the QRYDTA command.

When you submit a batch job using the query execution prompt, print files QQRYPRT and QQRYPRT2 are used.

Overrides

Before you issue QRYDTA to create a report, you can issue the OVRPRTF (Override with Printer File) command to specify:

- The number of printed copies of your report
- The print image to be used for your report
- The translation table to be used for printing your report
- The maximum number of print lines permitted in your report

If you want to use the OVRPRTF command, you must issue the command before you issue the QRYDTA command. The OVRPRTF command is described in the *CL Reference Manual*.

Output Queue

Each job on the system is assigned a job description object containing the initial attributes of the job. Most of the attributes within the job description can be overridden. One of the parameters (OUTQ) controls the output queue used for the printer's spooled files. If the IBM-supplied default job descriptions are used and the OUTQ parameter is not overridden, the query printed output is assigned to the QPRINT output queue.



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Chapter 8. How to Manage Existing Queries

You can use query to display information about a query, change the name of a query, authorize someone else to use query, or transfer ownership of the query to someone else. To access these functions, enter the DSNQRYAPP command and select option 3, manage existing queries, from the menu. Query then displays the query management menu.

Query Management Menu

You can use this menu to perform query management functions such as displaying detailed information about a query; changing the name, library, or description of a query; authorizing a query for another user; or changing the ownership of an application.

```

                                QUERY MANAGEMENT MENU

Select one of the following and enter values below:
  1. Display information about a query
  2. Rename or move a query
  3. Add or remove query users
  4. Change query owner

Option:                -
Query name:            *_____ (*-Query selection list)
Library name:         _____

HELP-Help   CF2-Previous display
```

The options are:

1. *Display information about a query:* This option displays information about the query you specify on this menu. Refer to Chapter 5 for a discussion of the query information display.
2. *Rename or move a query:* This option displays the query rename/move prompt. You can use this prompt to rename the query, move the query from one library to another, or change the description of the query.

3. *Add or remove query users:* This option displays the query authorization prompt. You can use this prompt to authorize other users to queries of which you are the owner.

4. *Change query owner:* This option displays the change query owner prompt. You can use this prompt to delete your ownership of a query and allow another user to become owner of that query.

Query name: Query fills in the name of the query application last specified on this display. You can change it. If you specify a generic name, query displays the query selection list. See *Using Selection Lists* in Chapter 2.

Library name: Query fills in the name of the library last specified on this display. You can change it. If this field is blank or contains *LIBL, query uses the Library list to find the first occurrence of the query application. If you specify *ALL or *ALLUSR, query displays query selection list. See *Using Selection Lists* in Chapter 2.

Press the CF1 or CF2 key to return to the query menu.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Query Rename/Move Prompt

If you selected option 2, Rename or move a query, from the query management menu, query displays the query rename/move prompt. You can use this prompt to rename, move, or change the description of the query.

If you want to perform a rename or move operation, complete this prompt and press the Enter/Rec Adv key. Query will then return to the query management menu.

If, after completing the prompt, you do not want to perform the rename or move operation, press the CF2 key. Query will then return to the query management menu.

QUERY RENAME/MOVE PROMPT

Current query:
Query name: OPEN Library: MYLIB
Description: Open order status

Enter desired changes:
Query name: OPEN Library: MYLIB
Description: Open order status

HELP-Help CF2-Previous display

An explanation of this prompt follows:

Current query:

Query name: The name of the query you specified on the query management menu.

Library: The name of the library containing the query.

Description: The text description assigned to the query.

Enter desired changes:

Query name: The new query name you want to use to rename the existing query.

Library: The name of the library that you want to move the query to.

Description: The new or changed text description that you want to assign the query.

Press the Enter/Rec Adv key to perform the rename/move operation that you have specified.

Note: If you specify a rename and a move, query first renames the application and then moves it. The entire operation is blocked if the new application name already exists for a program in the current application library.

Press the CF2 key if you do not want to perform the query rename/move prompt operation; query returns you to the query management menu.

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Query Add/Remove Users Prompt

If you selected option 3, Add or remove query users, from the query management menu, query displays the query add/remove users prompt. This prompt displays detailed information about a query. You can use this display to add a user to or remove a user from a specific query.

```

                                QUERY ADD/REMOVE USERS PROMPT
Query name:      OPEN           Library:  MYLIB
User profile:   USER           Owner:   SMITH

User to be added:  _____  (*-Add users of query below)
Query name:      _____  (*-Query selection list)
Library name:    _____

Authorized query users:
- *PUBLIC
- QPGMR
- QUSER

9-Remove user  HELP-Help  CF2-Previous display
```

An explanation of this prompt follows:

Query name: The name of the query that you have accessed.

Library name: This is the library containing the query.

User profile: This is the user profile of the query. If OWNER is specified the query will adopt the owner's authorization when it is executed. If it specifies USER, the query will use the user's authorization when it is executed.

Owner: This is the name of the current owner of the query.

User to be added: Key in the name of the new user that you want to have access to your query.

Query name: This is the name of the query that you want to copy users from. If you key in an asterisk (*), query displays the query selection list display.

Library name: This is the library containing the query.

Authorized query users: This is a list of the users that currently have access to this query.

- The less than (<) symbol appears if the user is not authorized to execute the query application.
- The greater than (>) symbol appears if the user is authorized to do something other than execute the query application. A user can have the < and > symbols at the same time.

Users having too little or excessive authority can be converted to users who can access your query by removing them from the display (by keying in a 9 next to the name) and adding them to the list once again.

The authorities addressable through this display are the object authorities to the query application. A user cannot access a query if he does not have authorization to execute the query.

An asterisk (*) in the user to be added field indicates that the list of users from the application named be merged into the current user list. Authority is not granted to these new users' until the list has been reviewed by the owner. The users' names that are added to the list are highlighted. You can delete a user's authorization to your query by placing a 9 in front of his name.

Any users you have copied onto this list are granted the right to use the application even if these users had additional rights to previous applications.

Press the Enter/Rec Adv key to perform the operation that you have specified, and to remain on this prompt.

Press the CF2 key to complete any requests you have made on this prompt and to return to the previous display.

Change Query Owner Prompt

If you selected option 4, Change query owner, from the query management menu, query displays the change query owner prompt. This prompt displays detailed information about a query. You can use this display to change the owner of a specific query.

When you change ownership of a query, you are no longer the owner. Queries can have only one owner.

```

                                CHANGE QUERY OWNER PROMPT

Query name:          OPEN           Library: MYLIB
Owner:              SMITH
Creation date/time: 07/21/81 08:25:09
File name:          QORDERS        Library: QIDU
Description:        Open order status
User profile:       USER

New owner name:     _____

HELP-Help  CF2-Previous display  CF3-File information
Press CF11 to change owner.  Press ENTER or CF2 to retain ownership.
```

An explanation of this prompt follows:

Query name: This is the name of the query that you want to change the owner of.

Library: This is the library containing the query.

Owner: This is the name of the current owner of the query.

Creation date/time: This is the date and time the query was created.

File name: This is the name of the file referenced by the query.

Library: This is the library containing the file.

Description: This is the text description of the query.

User profile: This is the user profile of the query. If OWNER is specified the query will adopt the owner's authorization when it is executed. If it specifies USER, the query will use the user's authorization when it is executed.

Note: Queries that have a user profile attribute of OWNER cannot have this ownership changed.

New owner name: This is the name of the owner to whom you want to assign ownership of this query.

Press the CF11 key to change the owner of the query.

Press the Enter/Rec Adv key or the CF2 key to retain the current owner.

Query Selection List Display

If you entered a generic name for a query or *ALL or *ALLUSR for Library name on a previous prompt, query displays the query selection list. The display of queries is shown sorted by query and library.

See *Using Selection Lists* in Chapter 2 for an explanation of the selection criteria used by query in producing this list.

QUERY SELECTION LIST			
QUERY	LIBRARY	FILE	DESCRIPTION
_ OPEN	MYLIB	QORDERS	Open order status
_ ORDERS	MYLIB	QORDERS	Order status
_ ORDERS5	MYLIB	QORDERS	Order status
_ ORDERS6	MYLIB	QORDERS	Order status

1-Select 2-Query information HELP-Help CF2-Previous display

An explanation of this display follows:

1-Select: Place a 1 in front of the query that you want to select. Press the Enter/Rec Adv key and query will perform the requested operation.

2-Query information: Place a 2 in front of the query that you want to display more information about. Query then displays the query information display.

Press the CF1 key to return to the query menu.

Press the CF2 key to return you to the interrupted display (the query create/change menu, query execution and report, the query management menu or the query add/remove users prompt.)

Press the CF6 key to display work station messages.

Press the CF7 key to display the query activity log.

Query Activity Log Display

You can use this display to view the actions that you have performed on queries and that others have performed on your queries. The log entries are sorted by date and time (in descending order).

QUERY ACTIVITY LOG					
Maximum number of log entries:				<u>100</u>	
DATE	TIME	QUERY	LIBRARY	ACTIVITY	USER
09/21/82	14:27:02	OPEN	MYLIB	COMPLETED	SMITH
09/21/82	14:26:20	OPEN	MYLIB	ACTIVE	SMITH
09/21/82	14:26:14	OPEN	MYLIB	QUEUED	SMITH
09/21/82	14:01:08	ORDERS6	MYLIB	CHANGED	SMITH
09/21/82	13:11:34	ORDERS6	MYLIB	CHANGED	SMITH
09/21/82	13:04:35	ORDERS6	MYLIB	COMPLETED	SMITH
09/21/82	13:04:02	ORDERS6	MYLIB	ACTIVE	SMITH
09/21/82	13:03:54	ORDERS6	MYLIB	QUEUED	SMITH
09/21/82	13:03:35	ORDERS6	MYLIB	CREATED	SMITH
09/21/82	12:55:51	ORDERS5	MYLIB	COMPLETED	SMITH
09/21/82	12:55:23	ORDERS5	MYLIB	ACTIVE	SMITH
09/21/82	12:55:17	ORDERS5	MYLIB	QUEUED	SMITH
09/21/82	12:54:51	ORDERS5	MYLIB	CREATED	SMITH
09/21/82	12:43:11	ORDERS	MYLIB	COMPLETED	SMITH
09/21/82	12:42:49	ORDERS	MYLIB	ACTIVE	SMITH
09/21/82	12:42:45	ORDERS	MYLIB	QUEUED	SMITH
09/21/82	12:42:35	ORDERS	MYLIB	CREATED	SMITH

HELP-Help CF2-Previous display

An explanation of this display follows:

Maximum number of log entries: When you exit from query, any entries more than this number are deleted from the log. Maximum value allowed is 9999.

Date: This is the date (in month, day, and year order) the log entry was recorded.

Time: This is the time of day (in hour, minute, and seconds order) the log entry was recorded.

Query: This is the name of the query.

Library: This is the name of the library containing the query.

Activity: This is the event that the log entry recorded. Activity descriptions are:

- Created
- Changed
- Changed owner
- Queued
- Active
- Completed
- Ended abnormally
- Renamed
- Moved
- Deleted

User: Who performed the action on the query when the log event was recorded.

Press the CF1 key to return to the menu you came from.

Press the CF2 key to return to the interrupted display.



Chapter 9. Additional Topics for Consideration

This chapter lists topics that should be considered by programmers who design and control query applications.

Note: You cannot change queries that were created before release 3. You must delete these query applications and recreate them.

DESIGN CONSIDERATIONS

Multiple Record Formats in One Query Application

More than one record format can be selected on the file review prompt or specified in source UDS statements. However, the following considerations apply to the use of more than one record format in an application:

- Computation of a result field cannot involve fields from different record formats. Computation of result fields is defined on the compute processing prompt during interactive query definition or in the COMPUTE UDS statement during batch definition.
- Selection testing defined for a record format cannot involve fields from different record formats. Selection testing is defined on the selection test and extended selection test prompts during interactive query definition, or in the RCDSSEL and TEST UDS statements during batch definition.
- Sort specifications defined for a record format cannot involve fields from different record formats. Sort specifications are described on the sort specification prompt during interactive query definition or in the SORT UDS statement during batch definition.
- The first sort field in each record format must be of the same type and must have the same length and number of decimal positions.
- Sort fields in the same relative position within different record formats:
 - Must all be sorted into ascending sequence or must all be sorted into descending sequence.
 - Must all be sorted as signed numeric fields or must all be sorted by absolute value.

Sort fields in the same relative position have the same name, data type, length, and number of decimal positions.

- Subtotal control fields are automatically positioned at the left of the report.
- Each line in a printed report can contain data from only one record format.

If an application you are designing requires concurrent processing of different record formats, you should consider using a programming language such as RPG to implement the application. The support for multiple record formats that is provided by query is oriented to processing record formats independently.

For example, if customer names are in one record format and the amount each customer owes is in a different record format, a single query application cannot print the names of all customers who owe more than \$500. For query to select records from both record formats, the selection criteria—customer name and amount owed—must exist in both record formats.

File Sharing

Query does not restrict access to data base files during execution of query applications. Other application programs can read or update a file at the same time query is creating a report from the file, and two or more query applications can refer to the same file at the same time. Consequently, totals, rankings, and record sequences in a query report may be inaccurate because another program updated the file during creation of the report.

To reduce the possibility that outdated data might be presented in a query report, you can enter one of the following commands before you request execution of a query application:

- **ALCOBJ** (Allocate Object) command, which can either ensure exclusive use of a file or prevent updates to the file during query execution. **ALCOBJ** is described in the *CL Reference Manual*. Enter the ***EXCLRD** keyword in the **OBJ** (object) parameter of the command to prevent file updates during query execution. If the **ALCOBJ** request is rejected, as it will be if another user is currently updating the file, the request for query execution probably will fail.
- **OVRDBF** (Override with Data Base File) command, which can grant exclusive use of a selected record format to the query application. **OVRDBF** is described in the *CL Reference Manual*. Enter the **RCDFMTLCK** parameter in the command.

As stated, the purpose of the two preceding commands is to restrict other users from specified objects during query execution. However, indiscriminate use of the two commands defeats the purpose of a multiprogramming system such as System/38. Therefore, before you use the commands in relation to query, you should consider whether the possibility of inconsistencies in a query report justifies prohibiting others from dynamically updating a file.

Level Checking

Level (version) checking is used by CPF to ensure that the versions of an application and the data base file used by the application are compatible.

When a query application is created, IDU extracts information about the associated file from the data description specifications (DDS), and incorporates that information in the query application. When the application is executed, the data base file is opened, and CPF verifies that the level checking test is met.

The level checking test is performed by means of a timestamp assigned to the file when the file is created. The test is performed only if LVLCHK(*YES) was specified in the CRTLF (Create Logical File) or CRTPF (Create Physical File) command that created the file. CRTLF and CRTPF are described in the *CL Reference Manual*.

If the data base file has been changed or if an override is used to point to a file with a different level checking value, the query application is not executed. Prior to issuing the QRYDTA command, however, you can issue the Override with Data Base File (OVRDBF) command to specify that level checking not be used. OVRDBF is described in the *CL Reference Manual*.

Invalid Data

Query always expects the data in a data base file to conform to DDS for the file. If the data in a file that is referred to by query does not match DDS for the file, the results produced by query are invalid.

For example, it is possible for data from an RPG array to be inconsistent with DDS for a file. The possibility exists because when data is moved to a file from an array, the data is moved one record at a time instead of one field at a time. When an entire record, instead of a single field, is placed in a file, validity checking of fields is bypassed.

If data in a file does not match the data types specified for the fields in the file (for example, if blanks instead of 0's are present in a packed decimal field), an error message is printed, and the results produced from the data by query will be invalid.

Responding to File Changes

A file used by a query application can be changed a number of times after the application is defined. The changes, such as the addition, deletion, or reordering of fields within record formats, may or may not affect the definition of the application directly.

- If the changes to a file do affect the definition directly, you must change the definition and then create an application from the new definition. For example, if fields referred to by your application are deleted, you must redefine the application.
- If the changes to a file do not affect the definition directly, you only need to re-create the application from the existing definition. For example, if deleted fields were not used by your application, enter the CRTQRYAPP command, which is described in Chapter 10, to create a new application from the existing definition. By re-creating the application, you ensure that it reflects the context of changed record formats.

Using the Library List

As indicated in the command descriptions, IDU often uses the library list (*LIBL) to find objects for which no library qualifier is specified in a command. Before query users enter IDU commands, you may want to verify that objects to be referred to in the commands are either qualified in the commands or named, if appropriate, in the library list. You can use the Display Library List (DSPLIBL) command to view the library list. You can use the Replace Library List (RPLLIBL) command to change the library list. DSPLIBL and RPLLIBL are described in the *CL Reference Manual*.

Specifying Generic Names

When you specify a generic name you should be as specific as possible. Query must search all the queries in all the libraries for a query application if you specify * or *ALL. If you specify B* in QGPL, query only needs to search for a query starting with B that is in library QGPL.

Sort Criteria

If you are executing a query for a summary list consisting of tables and totals (not subtables and subtotals), you do not need to specify a sort criteria.

User Profiles

You should operate with one user profile and password per person. The values saved on the menus and prompts between sessions are saved by user name. If there are duplicate passwords these users could conflict with each other.

Controlling the Size of Query Reports

A query application that does not contain specific selection criteria can generate a large number of print lines. There are four methods available for enforcing limits to the size of query reports:

- Specify record sampling to stop processing after a given number of records are selected for a report. The record sampling prompt is described in Chapter 5.
- Issue the OVRPRTF (Override with Printer File) command to limit the maximum number of print lines permitted in a report. The limit is specified in the MAXRCDS parameter of the OVRPRTF command. OVRPRTF must be issued before the QRYDTA command. The OVRPRTF command is described in the *CL Reference Manual*.
- Specify the number of records to be read by query in the Number of records to query field on the query execution prompt. The query execution prompt is described in Chapter 7.
- Specify the number of records to be read by query in the NBRRCDS parameter of the QRYDTA command. See Chapter 10. The last two methods are equivalent.

Numeric Field Overflow

The overflow of a numeric field occurs when the length specified for a numeric field is not large enough to accommodate a computed value, a total or an average (on a subtotal or total line), or a sum or an average (in a table). Numeric field overflow is most likely to occur if query processes a large number of records whose fields approach the limit that they can hold. For example, if a field is 9 digits in length and most of the numbers you sum to put in the field are 9 digits in length, numeric field overflow could occur.

When query senses the overflow of a numeric field, the message IDU0651 is printed on your listing. However, the line that includes the field that overflowed may be printed many pages later. If numeric field overflow occurs, some of your results will be invalid.

SECURITY

Specific security considerations for query users are described here. For a complete description of System/38 security conventions that affect all system users, see the *CPF Programmer's Guide*. Commands that implement security are described in the *CL Reference Manual*.

Object Authority for Query Users

To define and execute a query application by using query commands, a user must be authorized to access:

- Query commands
- Files required by the query application

Authorization to access commands and files can be granted specifically to individual users or generally to all system users.

Commands

Authorization Required for Commands: Use of the query commands requires the following authority:

Command	Authority Required
DSNQRYAPP	Operational authority over the command
CHGQRYDEF	Operational authority over the command, the file referenced, and authority to add objects to the library that is to contain the query application. If the TOAPP parameter of this command has value *APP, object existence rights over the query application is also required.
CRTQRYAPP	Operational authority over the command, any files referred to in the command, and authority to add objects to the library that is to contain the query application.
CRTQRYDEF	Operational authority over the command, the file referenced, and authority to add objects to the library that is to contain the query application.
DLTQRYAPP	Operational authority over the command and object existence authority over the application named in the command
QRYDTA	Operational authority over the command, the application named in the command, and the file named by the application

When query applications are defined and created, authorization to use the applications is specified in the PUBAUT parameter of the DSNQRYAPP, and CRTQRYAPP commands. If no value is specified for PUBAUT, the default value *NORMAL grants authority to an application to all system users.

To allow an operator to execute an application with your authorization in addition to the authorization granted to the operator, you can:

- Specify *OWNER with the USRPRF parameter of one of the following commands:
 - CRTQRYAPP
 - CHGQRYDEF
 - CRTQRYDEF
- Select the Adopt owner's profile option when using the DSNQRYAPP command.

The different categories of object authority are defined in the Glossary. Use of the different categories is described in the *CPF Programmer's Guide*.

Specifying Command Authorization: The query commands have a public authority of normal when they are shipped by IBM. This authority allows all users to use the DSNQRYAPP, CRTQRYAPP, CRTQRYDEF, CHGQRYDEF, QRYDTA, RTVQRYSRC, and DLTQRYAPP commands. The security officer can limit the use of the commands to individual users. (For information on how the security officer can limit the commands to individual users, see the *CPF Programmer's Guide*.)

Files

Authorization Required for Files: To execute a query application, the user must have operational authority over the files required by the application. The operational authority must include the right to read the files. If a file required by a query application is a logical file, the operational authority must extend to the physical file(s) from which the logical file is derived.

Specifying File Authorization: Initial authorization to use a file is specified when the file is created. Authorization is specified explicitly or by default. The default value, which is PUBAUT(*NORMAL) in the command that creates the file, grants operational authority to the file to all system users.

If a file contains sensitive information, the file should be placed in a private library, or authorization to use the file should be restricted. A physical file that contains sensitive information can be protected by logical files that reveal sensitive fields only to certain users, if any.

To protect fields in a physical file, you can follow these steps:

1. Specify PUBAUT(*NONE) in the CRTPF (Create Physical File) command that creates the physical file.
2. Specify PUBAUT(*NONE) in the CRTLF (Create Logical File) command that creates a logical file from the physical file. Do not include sensitive fields in the record format(s) defined for the logical file.
3. Grant specific query users the authority to read the physical file by issuing the GRTOBJAUT (Grant Object Authority) command: name the physical file in the command and specify AUT(*READ).
4. Grant specific query users the authority to use the logical file in a query application by issuing the GRTOBJAUT command: name the logical file in the command and specify AUT(*OPER).

The CRTPF, CRTLF, and GRTOBJAUT commands are described in the *CL Reference Manual*.

Access Paths

Query has access to the records included in access paths for the files named in query definition. Access paths for files are defined in DDS.

An access path for a file can contain select/omit logic to control which records are available in a logical file. If many work station users at your installation will be query users, you may want to specify select/omit logic in the access paths for some of the files. By including select/omit logic in the access paths for the files, you can protect sensitive information from casual uses of query.

For a description of how to specify select/omit logic in file access paths, see the *CPF Reference Manual—DDS*.

Menus for Query Users

To restrict the use of IDU commands, to help users request query, and to control the use of query, programmers may want to create query menus. The menus would be displayed to work station users who want to create and execute query applications. An example of such a menu follows:

QUERY MENU

Select one of the following:

1. Execute a query
2. Display status of execution
3. Design a new query
4. Design a new query based on an existing query
5. Delete a query

Select: _ Query name: _____

User authority over the menu would be specified in the control language program that controls the menu. For example, the CRTCLPGM (Create CL Program) command that creates the control language program for the menu could specify USRPRF(*OWNER). USRPRF(*OWNER) grants authority to the program according to both the owner's and the user's profiles. Thus, individual query users can be authorized to use a query menu without being authorized to use query commands: the authority to use query would not guarantee authority to use all functions available by way of the IDU commands.

The CL program would contain the DSNQRYAPP command with the option to support these functions.

CRTCLPGM is described in the *CL Reference Manual*. For an example of how to create a menu, see the *CPF Programmer's Guide*.

Programmers can use the CRTQRYDEF and CHGQRYDEF commands in a CL program to provide a limited subset of the functions provided by the DSNQRYAPP command.

EXECUTION NOTES

Execution Overrides

You can execute the same query application to create reports that are based on different file members.

If the file being queried contains several members, you can use the same application to create reports from different members by overriding the member name. To override the name, enter the OVRDBF (override with Data Base File) command before you enter the QRYDTA command. Specify a new member name in the MBR parameter of OVRDBF. The OVRDBF command is described in the *CL Reference Manual*.

The query execution prompt performs the override for you.

You can also specify a new file name in the OVRDBF command. If you do specify a new file name, you must also specify LVLCHK(*NO).

In addition to overriding member and file names, the OVRDBF command can be used to:

- Specify a new library name, or specify a particular library instead of the library list
- Prevent level checking
- Prevent file overrides, thereby ensuring that a query application is used only on a particular file

CL MESSAGE MONITORING

When a control language program uses any of the IDU commands, it should monitor for escape message IDU9001. This escape message is issued when IDU finds an error condition that will terminate query execution. For a further discussion of monitoring messages, see the *CL Reference Manual*.

Chapter 10. Query Commands

There are seven commands associated with query.

- Design Query Application (DSNQRYAPP) command. Use this command to:
 - Create new query applications
 - Change query applications
 - Delete query applications
 - Manage query applications
 - Execute query applications

This command displays menus and prompts to all query functions.

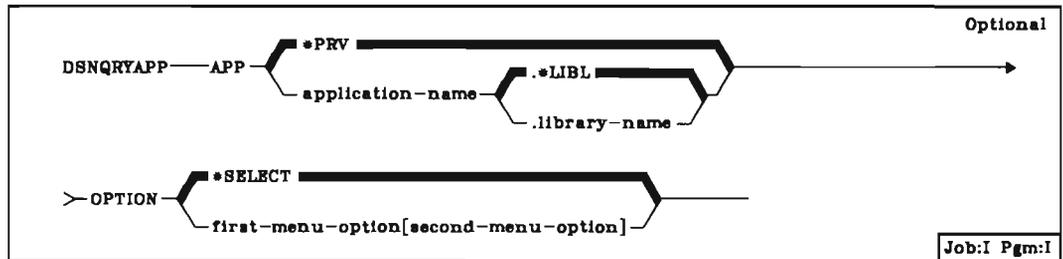
- Change Query Definition (CHGQRYDEF) command. This command can be used to change the definition of an existing application. Query displays a modified subset of the menus and prompts provided by the DSNQRYAPP command.
- Create Query Application (CRTQRYAPP) command. Use this command to create a query application from UDS source statements or from a definition stored in a query application (*SAVDFN used as source file parameter).
- Create Query Definition (CRTQRYDEF) command. This command can be used to create a definition for a new query application. Query displays a modified subset of the menus and prompts provided by the DSNQRYAPP command.
- Delete Query Application (DLTQRYAPP) command. This command can be used to delete an existing query application.
- Query Data (QRYDTA) command. This command can be used to execute an existing query application to create a report.
- Retrieve Query Source (RTVQRYSRC) command. Use this command to retrieve UDS source statements from an existing query application.

The CHGQRYDEF and CRTQRYDEF commands are intended primarily for the programmer to use in implementing a menu for the end user. If the end user is to directly use a command, the DSNQRYAPP command should be used.

Note: In the command syntax diagrams that follow, the **(P)** symbol indicates the limit to positional coding of parameters. If you code parameters beyond this limit, the system will respond with an error message.

DSNQRYAPP (Design Query Application) Command

The Design Query Application (DSNQRYAPP) command begins the query prompting sequence for interactive definition of a query application. You define a query application by responding to the prompts. DSNQRYAPP requires that the user have operational authority over the command.



APP Parameter: Specifies the qualified name of the query application.

***PRV:** The qualified name of the application used during your last query session is to be used.

application-name: Specify the name of the query application to be designed.

OPTION Parameter: Specifies the options you intend to use from the first two query displays. If you preselect the options on this parameter, query will skip the displays and will present the next logical display.

***SELECT:** The first two query displays will appear with the options you use to manage or define a query application.

first-menu-option: Enter one of the three options from the query menu. The resulting menu will be displayed next. Possible options are:

- 1—Create or change a menu
- 2—Execute queries and display output
- 3—Manage existing queries

second-menu-option: Enter one of the four options from the selected second menu. Possible second menus and their options are as follows:

Query Create/Change Menu (option 1)

- 1—Display information about a query
- 2—Create a new query
- 3—Change an existing query
- 4—Delete an existing query
- 5—Display the status of queries submitted

Query Execution and report Menu (option 2)

- 1–Display information about a query
- 2–Submit a query for execution
- 3–Display status of queries submitted for execution
- 4–Display output at work station from last execution

Query Management Menu (option 3)

- 1–Display information about a query
- 2–Rename or move a query
- 3–Add or remove query users
- 4–Change query owner

Example 1

```
DSNQRYAPP APP(QDATA.LIB1)
```

This command calls the displays associated with the query named QDATA in library LIB1.

Example 2

```
DSNQRYAPP APP(QDATA.LIB1) OPTION(3 2)
```

This command requests query for the purpose of managing existing queries (option 3 on the query menu) and further renaming or moving a query (option 2 on the query management menu).

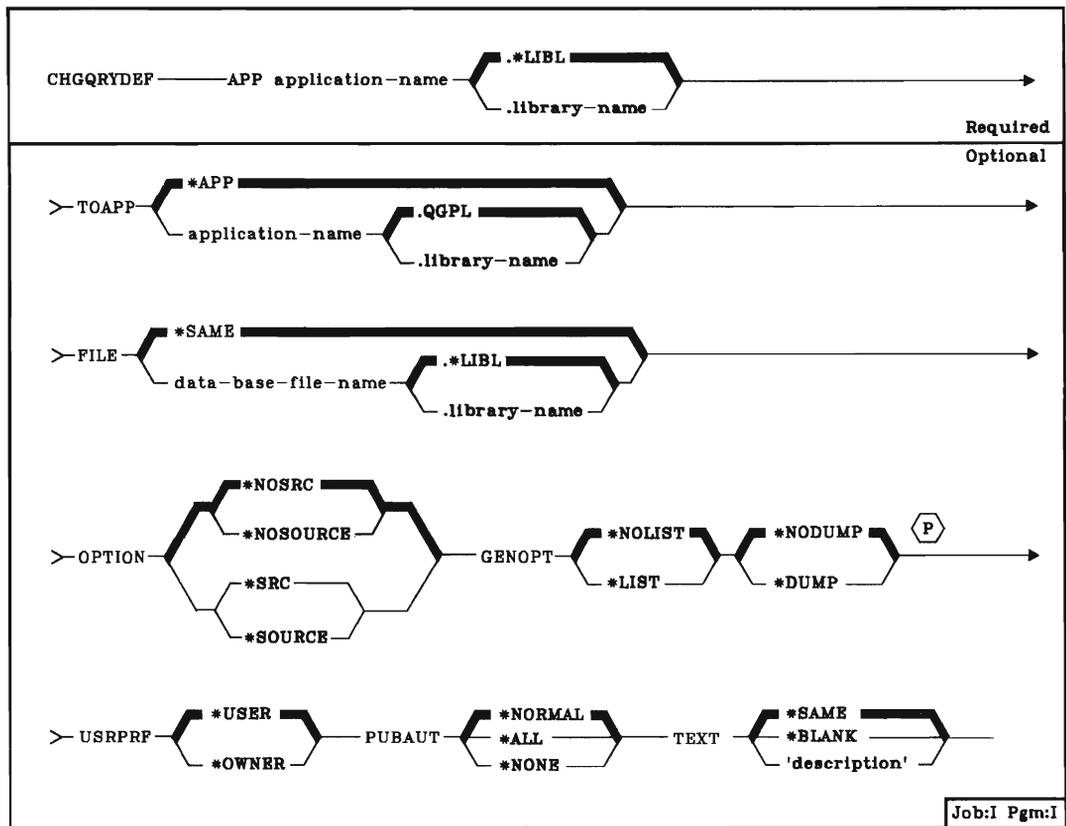
CHGQRYDEF (Change Query Definition) Command

The Change Query Definition (CHGQRYDEF) command begins a prompting sequence for interactive modification of a query application. Your responses to these prompts can be used to create a new application or to replace the original application.

The CHGQRYDEF command displays a subset of the displays provided by the DSNQRYAPP OPTION(1 3) command with the following differences:

- Query does not display the query change prompt.
- Query begins the prompting sequence with the query modify menu.
- Query ends the prompting sequence with the exit application definition menu.
- Query does not display option 6, Create application in batch, on the exit application definition menu.
- If you choose option 5, Create application interactively, on the exit application definition menu, query does not display the application creation prompt or the query execution menu. Query creates the application and returns you to the display or program where you issued the CHGQRYDEF command.
- If you choose option 4, Save definition, on the exit application definition menu, query does not display the save application prompt. Query saves the application definition and returns you to the display or program where you issued the CHGQRYDEF command.
- Query will automatically delete the original application if the application is to replace the original application. Query will not ask you to press the CF11 key.
- If you choose option 1, Restart definition, on the exit application definition menu, query displays the query modify menu instead of the query change prompt.
- If you press the CF13 key, query displays the TOAPP parameter for the application name on the application definition status display.

The screen flow in the prompting sequence remains the same as when the DSNQRYAPP command is used except where noted above.



APP Parameter: Specifies the qualified name of the application being changed. If no library name is given, query uses the library list to find the first occurrence of the application name.

TOAPP Parameter: Specifies the qualified name of the application in which the application resulting from your changes is to be stored.

***APP:** Specifies that the original application is to be replaced by the application resulting from your changes.

application name: Enter the name of the application in which the changed application is to be stored. The application specified in the APP parameter will remain unchanged. If no library name is specified, the new application is stored in library QGPL.

FILE Parameter: Specifies the name of an existing data base file that is defined by DDS.

***SAME:** The data base file specified in the original application is to be used.

data base file name: Specifies the name of an existing data base file to be referred to during definition and execution of the application. If no library name is specified, query uses the first occurrence of the data base file name it finds in the library list.

OPTION Parameter: Specifies whether a listing of the UDS is to be printed which may be helpful if problems occur.

***NOSRC** or ***NOSOURCE:** Specifies that query is not to print a listing of the UDS. The ***NOSRC** and the ***NOSOURCE** values are equivalent.

***SRC** or ***SOURCE:** Specifies that query is to print a listing of the UDS. The ***SRC** and the ***SOURCE** values are equivalent.

GENOPT Parameter: Specifies whether the IDU program listings for the changed application are to be produced. These listings may be helpful if problems occur.

***NOLIST:** Specifies that query is not to print an internal representation of the application program.

***LIST:** Specifies that query is to print an internal representation of the application program.

***NODUMP:** Specifies that query is not to print the application program template.

***DUMP:** Specifies that query is to print the application program template. This is meaningful only if ***LIST** is also specified.

USRPRF Parameter: Specifies the user profile under which the application is to be executed. This parameter allows you to define a query application for someone who does not have full authority over the data base file that the application reads.

***USER:** The user profile of the application user is in effect during execution of the application.

***OWNER:** The user profiles of both the user of the application and the owner of the application are in effect during execution of the application.

When you create or change an application that is to be used by someone else, you must authorize the user for the use of the application and any objects associated with the application. You can grant each user specific authority to such objects. If you want to grant authority to use these objects only during execution of the application, specify **USRPRF(*OWNER)** when you create or change the application.

PUBAUT Parameter: Specifies what authority over the application is to be extended to all system users.

***NORMAL:** All system users can execute or read the application but all users cannot delete the application.

***ALL:** All system users have complete authority over the application.

***NONE:** All system users except the owner of the application are restricted from using the application. The owner can grant rights to specific users.

TEXT Parameter: Specifies a brief description of the changed application.

***SAME:** The description of the changed application is to be the same as the original application.

***BLANK:** The changed application is to have no description.

'description': Enter no more than 50 characters, enclosed in apostrophes, to describe the changed application.

Example

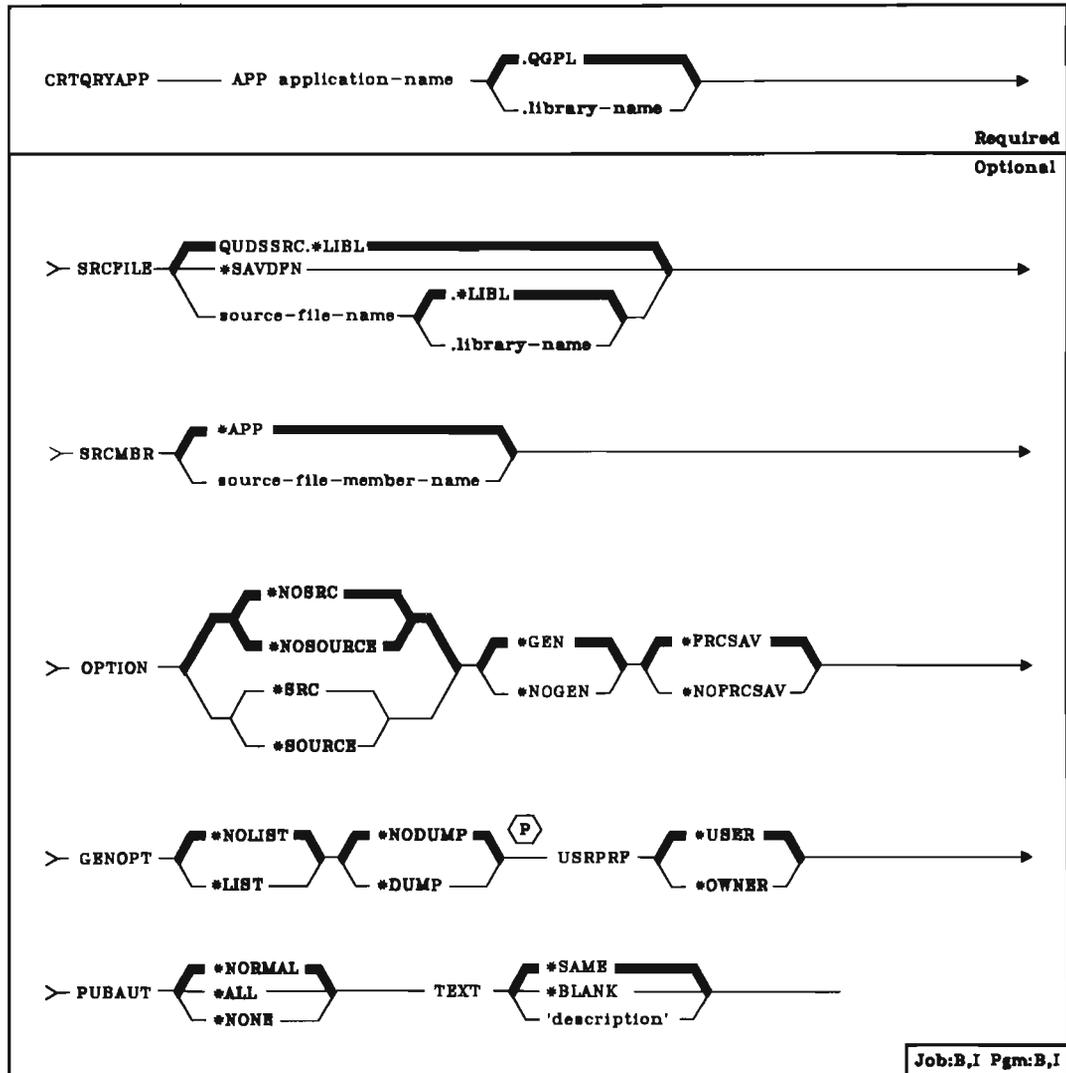
```
CHGQRYDEF APP(TEST1) TOAPP(TEST2)
TEXT('Create application TEST2 based on TEST1')
```

This command begins a prompting sequence which allows you to create an application named TEST2, in library QGPL, based on the first occurrence of application TEST1 in your library list. The description of application TEST2 is the literal contained in the TEXT parameter. Your responses to the prompts can result in other changes to application TEST2. Application TEST1 is not changed. Application TEST2 uses data from the data base file specified for application TEST1. No UDS or internal representation of TEST2 will be printed. Any system user can execute or read TEST2, but only the owner of the application can delete it.

CRTQRYAPP (Create Query Application) Command

The Create Query Application (CRTQRYAPP) command creates an executable query application from UDS source statements or from a definition stored in a query application.

To use the CRTQRYAPP command, the user must have operational authority over the command and any files referred to in the command.



APP Parameter: Specifies the name of the application you are creating and specifies the library in which it is to be stored. If no library name is given, the application is stored in the *general-purpose library (QGPL)*. The application name must be unique in the library where it is stored.

SRCFILE Parameter: Specifies the name of the source file that contains the definition of the application. If no library qualifier is specified, the library list (*LIBL) is used to find the file.

QUDSSRC: The QUDSSRC source file is provided in the library QIDU.

source-file-name: An existing source file other than the provided QUDSSRC.

***SAVDFN:** The definition of the application was previously saved in the application you specified in the APP parameter. Query creates an executable application with the same name and automatically deletes the original application. Query ignores a library name specified with *SAVDFN.

Note: CRTQRYAPP ignores overrides to any source file that contains UDS statements.

SRCMBR Parameter: Specifies the name of the source member that contains the definition of the application. Query ignores this parameter if you specified *SAVDFN for the SRCFILE parameter.

***APP:** The definition of the application is in a source member that has the same name as the name specified in the APP parameter, which is described in a preceding paragraph.

source-file-member-name: The definition of the application is in a source member which has a name that is different from the name in the APP parameter. APP is described in a preceding paragraph.

OPTION Parameter: Specifies whether or not a listing of the source UDS is printed; specifies whether an executable application is actually created, or whether the source UDS is only checked for errors; specifies whether or not service information is to be printed. Select one value from each of the following groups: *SOURCE or *SRC and *NOSOURCE or *NOSRC; *GEN and *NOGEN; *NODUMP, *DUMP, and *EXCDUMP; *NOTRACE and *TRACE.

***NOSRC or *NOSOURCE:** Specifies that query is not to print a listing of the source UDS. However, query does print a listing of errors found in the source UDS. The *NOSRC and *NOSOURCE values are equivalent.

***SRC or *SOURCE:** Specifies that query is to print a listing of the source UDS. The *SRC and *SOURCE values are equivalent.

***GEN:** Create an executable application.

***NOGEN:** Do not create an executable application: perform error checking only.

***FRCSAV:** Specifies that the definition of an application should be saved whether or not the application will be executable. If *FRCSAV is not specified, the UDS is not saved if the application fails to create.

***NOFRCSAV:** Specifies that the definition should not be saved if the application fails to create.

GENOPT Parameter: Specifies the printing of IDU program listings created for your application. The listings may be required if a problem occurs in IDU.

***NOLIST:** Specifies that you do not want an internal representation of the program printed.

***LIST:** Specifies printing of IRP received by the CPF program resolution monitor (PRM). The PRM creates an executable program from the IRP during the creation of an application. The IRP listing generated by GENOPT(*LIST) includes source IRP, associated hexadecimal code, and any IRP error messages.

***NODUMP:** Specifies that you do not want to print the program template created for an application.

***Dump:** Specifies printing of the program created for an application. The program is printed during the creation of an application. This is meaningful only if *LIST is also specified.

USRPRF Parameter: Specifies under which user profile the application is to be executed.

***USER:** The user profile for the application user is in effect when the application is executed.

***OWNER:** The user profiles of both the application owner and the application user are in effect when the application is executed.

When you create an application that is to be used by someone else, you must authorize the user to use not only the application but also the objects (such as files) that are associated with the application. You can grant each user specific rights to such objects; or, by specifying USRPRF(*OWNER) when an application is created, you can permit a user to temporarily assume your authority to use objects that are associated with the application. USRPRF(*OWNER) specifies that the application always is to run under the owner's user profile, and that the user is to be automatically granted your rights to the objects that are required by the application. Each user assumes your rights only when the application is being executed and only within the application.

Note: Specify the USRPRF parameter to reflect the security requirements that exist at your installation. Security is discussed briefly in Chapter 9. The security facilities available on System/38 are described in more detail in the *CPF Programmer's Guide* and the *CL Reference Manual*.

PUBAUT Parameter: Specifies what authority over the application is extended to all system users.

***NORMAL:** All system users can execute the application, but all users cannot change the application.

***ALL:** All system users have complete authority over the application.

***NONE:** All users but the owner are restricted from the application. The owner can subsequently grant some or all rights to some or all other users.

Note: Specify the PUBAUT parameter to reflect the security requirements that exist at your installation. Security is discussed briefly in Chapter 9. The security facilities available on System/38 are described in more detail in the *CPF Programmer's Guide* and the *CL Reference Manual*.

TEXT Parameter: Lets you specify a description of the application.

***SAME:** Copy the description from the original definition.

***BLANK:** There is no description of this application.

'text': The specified character string is entered as a description of the application. The character string can contain a maximum of 50 characters enclosed by apostrophes.

Example

To create an executable query application from the revised definition, you could enter:

```
CRTQRYAPP APP(DOEQRY2) SRCMBR(JHDOE) SRCFILE(JHDOE) TEXT('DOE ORDER QUERY 2')
```

CRTQRYDEF (Create Query Definition) Command

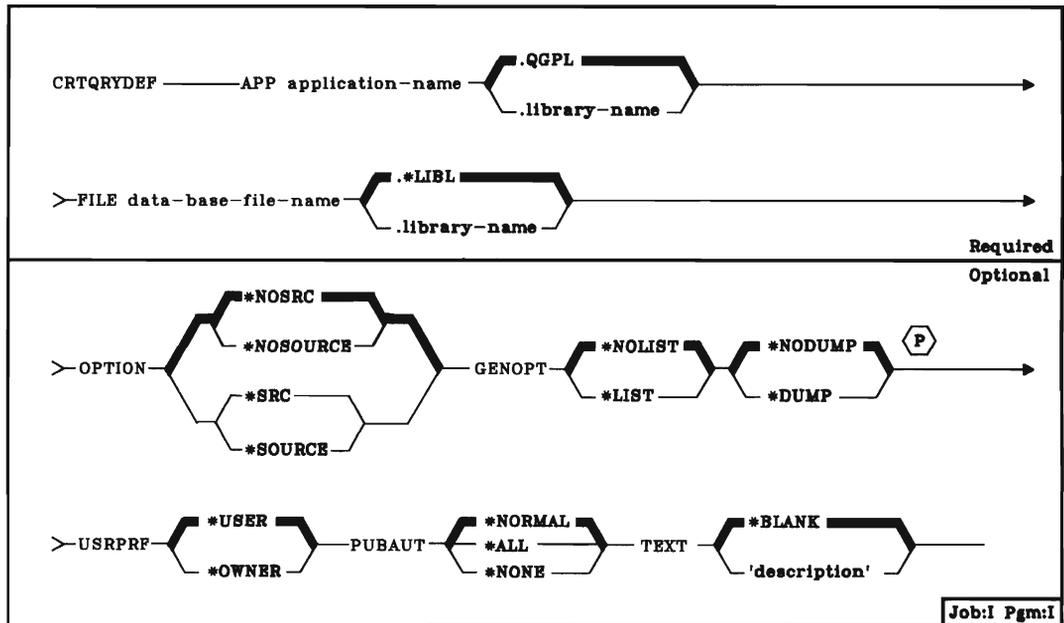
The Create Query Definition (CRTQRYDEF) command begins a prompting sequence for interactive definition of a query application. Your responses to these prompts can be used to create a new application.

The CRTQRYDEF command displays a subset of the displays provided by the DSNQRYAPP OPTION(1 2) command with the following differences:

- Query does not display the query create prompt.
- Query begins the sequence with the output specification prompt.
- Query ends the sequence with the exit application definition menu.
- Query does not display option 6, Create application in batch, on the exit application definition menu.
- If you choose option 5, Create application interactively, on the exit application definition menu, query does not display the application creation prompt or the query execution menu. Query creates the application and returns you to the display or program where you issued the CRTQRYDEF command.
- If you choose option 5, Create application, on the exit application definition menu, query does not display the application creation prompt or the query execution menu. Query creates the application and returns you to the display or program where you issued the CRTQRYDEF command.
- If you choose option 4, Save definition, on the exit application definition menu, query does not display the save application prompt. Query saves the application definition and returns you to the display or program where you issued the CRTQRYDEF command.
- If you choose option 1, Restart definition, on the exit application definition menu, query displays the output specification prompt instead of the query create prompt.

The screen flow in the prompting sequence remains the same as when the DSNQRYAPP command is used except where noted above.

The command function keys remain the same as when the DSNQRYAPP command is used except at the output specification prompt. If you press the CF2 key or the CF1 key at the output specification prompt, query returns you to the display or program where you issued the CRTQRYDEF command.



APP Parameter: Specifies the qualified name of the application being defined. If no library name is given, query stores the application in QGPL.

FILE Parameter: Specifies the name of an existing data base file that is defined by DDS. The file contains record formats that will be referred to by the application you are defining. If no library name is specified, query finds the first occurrence of the data base file name in the library list.

OPTION Parameter: Specifies whether a listing of the DDS is to be printed which may be helpful if problems occur.

***NOSRC or *NOSOURCE:** Specifies that query is not to print a listing of the UDS. The *NOSRC and the *NOSOURCE values are equivalent.

***SRC or *SOURCE:** Specifies that query is to print a listing of the UDS. The *SRC and the *SOURCE values are equivalent.

GENOPT Parameter: Specifies whether the IDU program listings for the changed application are to be produced. These listings may be helpful if problems occur.

***NOLIST:** Specifies that query is not to print an internal representation of the application.

***LIST:** Specifies that query is to print an internal representation of the application program.

***NODUMP:** Specifies that query is not to print the application program template.

***DUMP:** Specifies that query is to print the application program template. This is meaningful only if *LIST is also specified.

USRPRF Parameter: Specifies the user profile under which the application is to be executed. This parameter allows you to define a query application for someone who does not have full authority over the data base file that the application reads.

***USER:** The user profile of the application user is in effect during execution of the application.

***OWNER:** The user profiles of both the user of the application and owner of the application are in effect during execution of the application.

When you create or change an application that is to be used by someone else, you must authorize the user for the use of the application and any objects associated with the application. You can grant each user specific authority to such objects. If you want to grant authority to use these objects only during execution of the application, specify USRPRF(*OWNER) when you create or change the application.

PUBAUT Parameter: Specifies what authority over the application is to be extended to all system users.

***NORMAL:** All system users can execute or read the application, but all users cannot delete the application.

***ALL:** All system users have complete authority over the application.

***NONE:** All system users except the owner of the application are restricted from using the application. The owner can grant rights to specific users.

TEXT Parameter: Specifies a brief description of the application.

***BLANK:** The application is to have no description.

'description': Enter no more than 50 characters, enclosed in apostrophes, to describe the application.

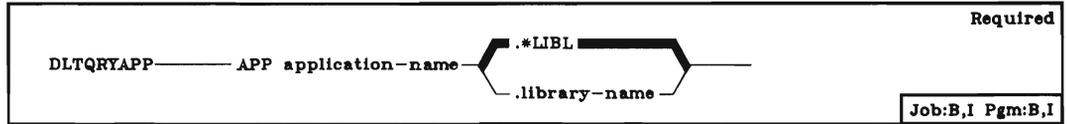
Example

```
CRTQRYDEF APP(TEST1) FILE(FILE1)
TEXT('Create application TEST1')
```

This command begins a prompting sequence which allows you to create an application named TEST1 in library QGPL. The description of application TEST1 is the literal contained in the TEXT parameter. You have also specified that TEST1 uses data from the data base file named FILE1 in your library list. No UDS or internal representation of TEST1 will be printed. Any system user can execute or read TEST1, but only the owner of the application can delete it.

DLTQRYAPP (Delete Query Application) Command

The Delete Query Application (DLTQRYAPP) command deletes an existing query application from a library. DLTQRYAPP requires that the user have operational authority over the command and object existence authority over the application specified in the command.



APP Parameter: Specifies the name of the query application you are deleting, and specifies the name of the library in which it is stored. If no library qualifier is specified, the library list (*LIBL) is used to find the application.

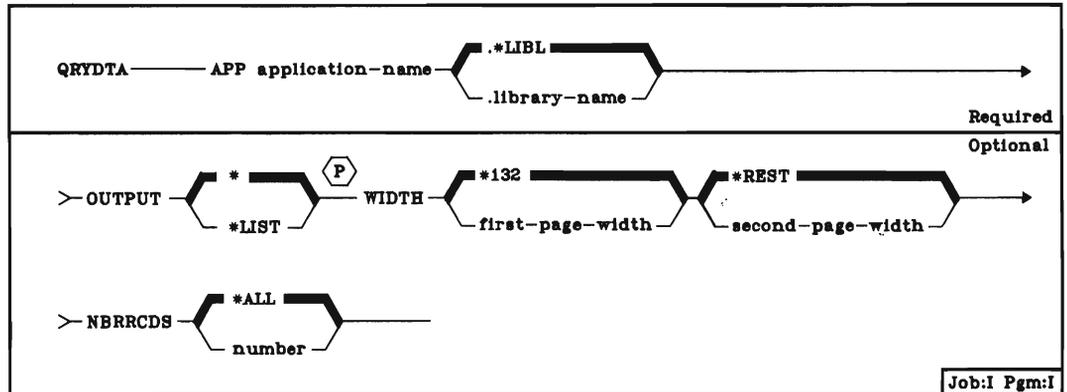
Example

To delete an application named MYQRY, you could enter:

```
DLTQRYAPP APP(MYQRY)
```

QRYDTA (Query Data) Command

The Query Data (QRYDTA) command executes a query application to create a report. QRYDTA requires that the user have operational authority over the command, the application specified in the command, and the data base file that is read by the application.



APP Parameter: Specifies the name of the query application you want to execute, and specifies the name of the library in which it is stored. If no library qualifier is specified, the library list (*LIBL) is used to find the application.

OUTPUT Parameter: Specifies whether the report is to be displayed before it is printed.

***:** If the QRYDTA command is entered from a work station, display the report on the display screen. Then, at the end of the job, spool the report for printing. If the QRYDTA command is not entered from a work station, spool the report for printing by the system printer.

***LIST:** Spool the report for printing by the system printer.

WIDTH Parameter: The width parameter has two parts. The first designation is the number of characters to be printed on the first page of your report. The second designation is the number of characters to be printed on the second page (if required) of your report.

When the QRYFLD or TABLE listings produce a column of text that is split between two pages, you can shorten the first page width designation to force the printed column entirely to the second page of the listing.

When the queried file is overridden to a data file, the width parameter is ignored and the record length of the file is used instead. The width parameter does not change the forms width of the printer device file, so you can specify the width parameter separately as an override.

NBRRCDS Parameter: This parameter specifies the number of records that you want query to read from the file. *ALL is the default and specifies that query will process all records in the file. You can also specify the exact number of records you want query to read from the file.

Example

To request a listing of the report provided by an application named MYQRY, you could enter:

```
QRYDTA APP(MYQRY) OUTPUT(*LIST)
```




Chapter 11. Source Statement Syntax

You can create an application from a source definition at your convenience. You create the application by entering the CRTQRYAPP command. Because user interaction is not required during the creation of an application from a stored definition, you can enter the CRTQRYAPP command in one of two ways: (1) enter the command interactively from a work station, or (2) submit the command in a batch job. To submit the command in a batch job, use the //JOB (Job) or SBMJOB (Submit Job) command.

Batch jobs are described in the *CPF Programmer's Guide*. The //JOB and SBMJOB commands are described in the *CL Reference Manual*.

Batch entry of the CRTQRYAPP command offers the following advantages over interactive entry of CRTQRYAPP:

- Work station time is used more efficiently. If CRTQRYAPP is entered interactively, the work station from which it is entered is inoperable from the time the command is entered until the time the application is created.
- System performance may be improved because the request for creation of the application is placed in the system storage pool for batch jobs.

BATCH DEFINITION

Batch definition of a query application requires that you:

1. Compose UDS statements
2. Store the UDS statements in a source file member

To create a query application from the stored UDS statements, enter the CRTQRYAPP command.

Compose UDS Source

The definition of a query application can contain 13 kinds of UDS source statements. Each statement has the form of a command. Together, the UDS source statements provide query with the same information you can provide on the interactive definition prompts.

Query UDS statements are summarized here. They are described in detail in following paragraphs. The descriptions of UDS statements are for query users who want to code UDS statements rather than respond to the interactive definition prompts.

Statement	Summary
QRYAPP	Identifies the data base file from which you will create a report and names the query application you are defining. Required, and must be first.
OUTPUT	Defines the cover page and page headings for your report. Optional. Must follow the QRYAPP statement and precede QRYFMT, or be at the end of the definition.
RCDSMP	Defines the record sampling to be performed by the application. Optional. Must follow the QRYAPP statement and precede QRYFMT, or be at the end of the definition.
QRYFMT	Identifies a record format used by the application. The record format must exist in the file named in the QRYAPP statement. Required and repeatable. Must follow the QRYAPP statement and precede all other statements except OUTPUT and RCDSMP. All UDS statements that refer exclusively to the record format named in a QRYFMT statement must follow that statement and precede the next QRYFMT statement, if any.
COMPUTE	Defines the computation of a result field. Optional and repeatable. Must follow the associated QRYFMT statement, and precede any other statements that refer to the result field defined by COMPUTE.
QRYFLD	Specifies operations on selected fields. Required for each QRYFMT statement unless the TABULATE statement is used. Repeatable. Must follow the associated QRYFMT statement.
RCDSEL	Defines record selection logic. Optional and repeatable. Must follow the associated QRYFMT statement and precede associated TEST statements.
TEST	Defines record selection tests. Optional and repeatable. Must follow the associated RCDSEL statement.

Statement	Summary
TABULATE	Defines the creation of a table. Required for each QRYFMT statement unless the QRYFLD statement is used. Repeatable. Must follow the associated QRYFMT statement.
TABCLS	Defines major class values for a table. Required for each TABULATE statement that specifies TYPE(*CLS). Repeatable. Must follow the associated TABULATE statement.
TABCLSMTX	Defines minor class values for a table. Required for each TABULATE statement that specifies MTXTYPE(*CLS). Repeatable. Must follow the associated TABULATE statement.
TABCMPT	Defines the computations for a table. Required for each TABULATE statement. Repeatable. Must follow the associated TABULATE statement.
SORT	Defines a sort order and specifies sort options. Required if the sort order for the application is to be different from the order defined by DDS for the file. Repeatable. The first SORT statement defines the primary sort field for a record format, the second SORT statement defines the second sort field, the third SORT statement defines the third sort field, and so on. Must follow the associated QRYFMT statement.

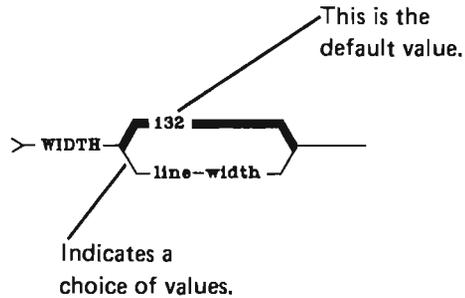
UDS Descriptions

The following UDS statement descriptions indicate:

- The statements that are required in the definition of a query application
- The function of each UDS statement
- The required order of the statements in a definition
- The definition prompt(s), if any, to which the statements correspond

The descriptions include syntax diagrams. The syntax diagrams show the parameters and values that are valid for each UDS statement. The parameters are divided into two groups: required parameters and optional parameters. The required parameters are boxed with the statement name at the beginning of the diagram.

Most of the optional parameters have more than one value from which to choose. A choice of values is indicated whenever a horizontal line follows the parameter keyword and splits into two or more lines. When a choice of values is indicated, the default value (that is, the value used by the system for unspecified parameters) is on the top and is indicated by a heavy line. For example:



Values for parameters are not enclosed by parentheses in the syntax diagrams. However, the values must be enclosed by parentheses if parameter keywords are entered in a statement. For example:

```
WIDTH(132)
```

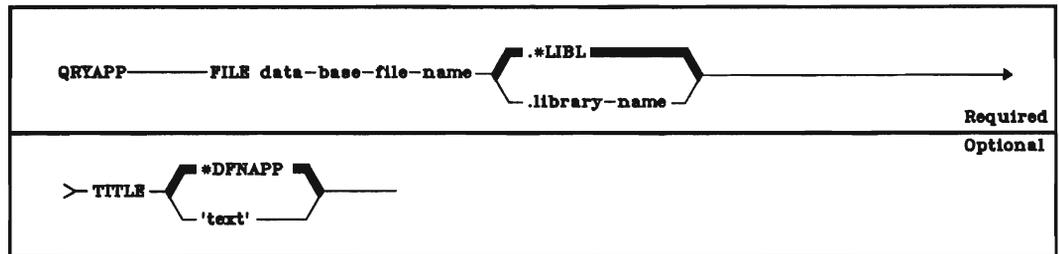
For a complete description of UDS syntax, see the description of command syntax in the *CL Reference Manual*.

Parameters are described in the same order as they are shown in the syntax diagrams. The parameter descriptions that follow the syntax diagrams either are explicit or refer to corresponding parameters in the query definition prompts. The detailed descriptions of prompts in this chapter are valid for corresponding parameters in UDS statements.

QRYAPP (Query Application) Statement

A QRYAPP statement is required for each definition of a query application. QRYAPP specifies the name of the application being defined and can also specify a text description of the application. QRYAPP must be the first statement in the definition.

The QRYAPP statement corresponds to the query create prompt or the query change prompt.

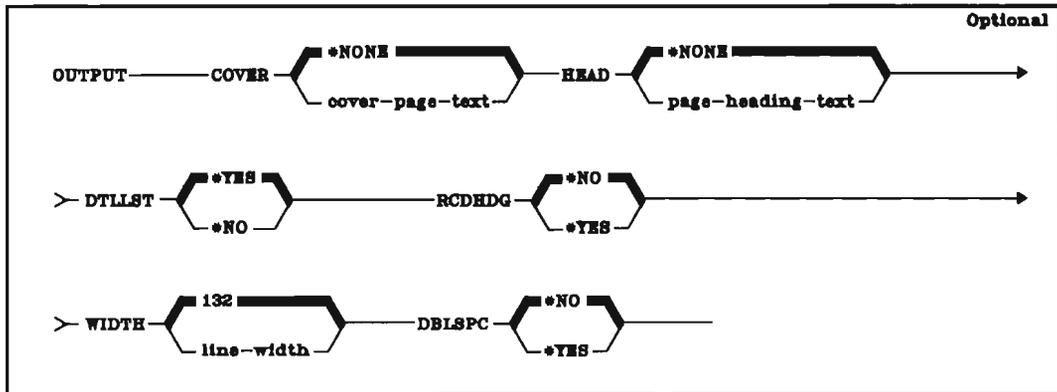


FILE: Specifies the name of an existing data base file whose record formats can be referred to by the application. The member name is assumed to be the first in the file.

TITLE: Specifies a character string to be stored in the UDS source. The string can contain a maximum of 50 characters enclosed by apostrophes. If the TITLE parameter is not coded, or if the default *DFNAPP is coded, the value for TITLE in the listed UDS source is the application name specified by the CRTQRYAPP command if you entered original UDS.

OUTPUT (Output) Statement

The OUTPUT statement is optional: query provides default values for formatting output. Only one OUTPUT statement is permitted in a definition. The OUTPUT statement specifies a cover page for the front of the report, page headings for the report, whether a detail list or a summary list is being defined, whether the headings for different record formats are to appear on a common heading line or are to be separated, and the output line width. The OUTPUT statement must follow the QRYAPP statement (described in a preceding paragraph) and precede the QRYFMT statement (described in a following paragraph), or the statement must appear at the end of the definition. The OUTPUT statement corresponds to the output specification prompt.

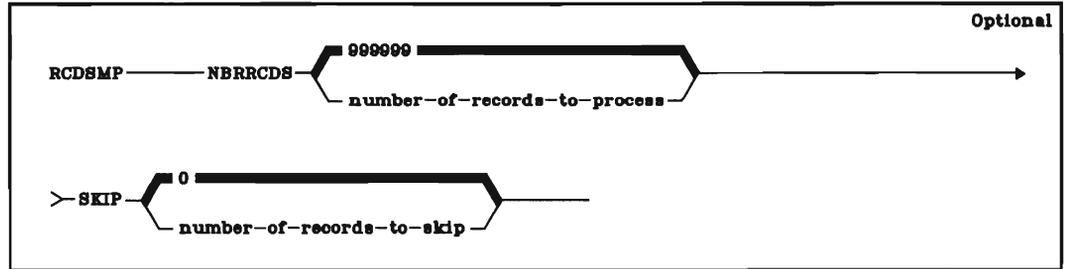


The following shows the relationship between the parameters in the OUTPUT statement and the parameters in the output specification prompt:

OUTPUT Statement Parameter	Corresponding Parameter in the Output Specification Prompt
COVER	Cover page
HEAD	Page heading
DTLLST	Detail listing
RCDHDG	Separate record format headings
WIDTH	Output line width
DBLSPC	Detail listing double spaced

RCDSMP (Record Sampling) Statement

The RCDSMP statement is optional. Only one RCDSMP statement is permitted in a definition. It specifies the record sampling that is to be performed for the report. The RCDSMP statement must follow the QRYAPP statement (described in a preceding paragraph) and precede the QRYFMT statement (described in a following paragraph), or the statement must appear at the end of the definition. The RCDSMP statement corresponds to the record sampling prompt.



The following shows the relationship between the parameters in the RCDSMP statement and the parameters in the record sampling prompt:

RCDSMP Statement Parameter	Corresponding Parameter in the Record Sampling Prompt
NBRRCDS	Number of records after which processing should stop. (A value of 999999 specifies that query process all the records in the file.)
SKIP	Number of records to skip after each processed record.

QRYFMT (Query Record Format) Statement

At least one QRYFMT statement is required in each definition of a query application. A definition can contain more than one QRYFMT statement. The statement specifies the name of a record format that is referred to by the query application. The record format must exist in the file named in the QRYAPP statement. QRYFMT must follow QRYAPP and must precede all other UDS statements except OUTPUT and RCDSMP (OUTPUT and RCDSMP are described in preceding paragraphs). The QRYFMT statement corresponds to the file review prompt.

Required
QRYFMT _____ RCDFMT record-format-name _____

RCDFMT: Corresponds to record format selection on the file review prompt.

COMPUTE (Compute) Statement

The COMPUTE statement is optional. More than one COMPUTE statement can be included in a definition. The statement specifies the computation definition of a result field. The statement must follow the QRYFMT statement that identifies the record format containing the defined result field (QRYFMT is described in a preceding paragraph). The COMPUTE statement must precede any other statement that refers to the defined result field. The COMPUTE statement corresponds to the compute processing prompt.

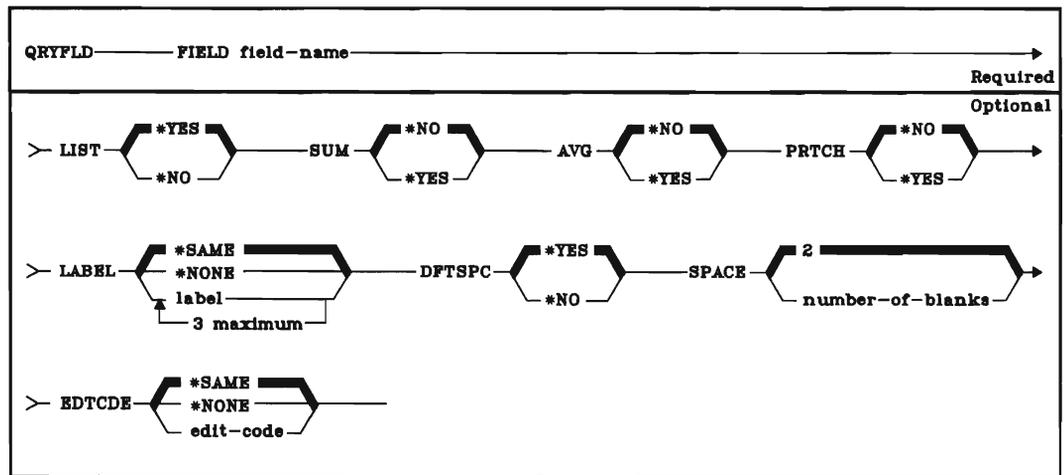
Required
COMPUTE _____ FIELD result-field-name _____ VALUE computed-value _____

The following shows the relationship between the parameters in the COMPUTE statement and the parameters in the compute processing prompt:

COMPUTE Statement Parameter	Corresponding Parameter in the Compute Processing Prompt
FIELD	The field named in the second line of the prompt. (The name must be unique within the record format, must begin with an alphabetic character, and can be a maximum of 10 alphanumeric characters long.)
VALUE	Computed value (a computational expression).

QRYFLD (Query Field) Statement

Unless TABULATE statements are used, at least one QRYFLD statement is required for every QRYFMT statement included in a definition (QRYFMT is described in a preceding paragraph, TABULATE is described in a following paragraph). The QRYFLD statement identifies a field that is to be printed, displayed, summed, or averaged. QRYFLD statements must follow the QRYFMT statement that identifies the record format containing the specified fields. Fields are listed from left to right by a query application in the order in which the associated QRYFLD statements appear in the UDS for the application. The physical order of QRYFLD statements corresponds to entries in the ORDER column of the query definition prompt. For the creation of an application, each QRYFLD statement corresponds to one line on the query definition prompt in which ORDER is specified; for the modification of an application, each QRYFLD statement corresponds to one extended line prompt. The QRYFLD statement corresponds to both the query definition and the extended list prompts.

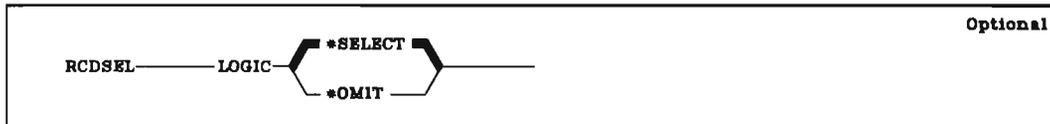


The following shows the relationship between the parameters in the QRYFLD statement and the parameters in the query definition and the extended list prompts:

QRYFLD Statement Parameter	Corresponding Parameter
LIST	ORDER (query definition prompt and extended list prompt). LIST (*YES) must be specified for character fields, and LIST(*YES), SUM(*YES), or AVG(*YES) must be specified for numeric fields.
SUM	SUM (query definition prompt and extended list prompt).
AVG	AVG (query definition prompt and extended list prompt).
PRTCHG	List only if change (extended list prompt).
LABEL	Label (extended list prompt).
DFTSPC	Default spacing (extended list prompt).
SPACE	Number of spaces (extended list prompt). This parameter is ignored if DFTSPC(*YES) is specified.
EDTCDE	Edit code (extended list prompt).

RCDSEL (Record Selection) Statement

The optional RCDSEL statement specifies whether the TEST statement(s) is part of a select or an omit group. Multiple RCDSEL statements can be included in a definition. If the RCDSEL statement is specified, it must be preceded by the QRYFMT statement that identifies the record format being tested for record selection and must be followed immediately by at least one TEST statement that defines the record selection group. (Both RCDSEL and TEST are described in this chapter.) The RCDSEL statement corresponds to the selection test prompt.



LOGIC: Corresponds to the following parameter in the selection test prompt:
Enter tests for *SELECT/*OMIT group.

TEST (Test) Statement

At least one TEST statement is required for each RCDSEL statement (RCDSEL is described in a preceding paragraph). More than one TEST statement can be included in a definition. The statement defines a field test for record selection. If RCDSEL statements are specified, TEST statements must immediately follow the RCDSEL statement that specifies whether the field test is for selection or omission. Multiple TEST statements under one RCDSEL statement correspond to multiple lines on the selection test prompt. Multiple RCDSEL statements and their associated TEST statements correspond to multiple selection test prompts, each of the prompts being concluded by pressing the Enter/Rec Adv key. The TEST statement corresponds to the selection test prompt.

Required if RCDSEL statements specified
TEST _____ FIELD <i>field-name</i> _____ REL <i>relational-operator</i> _____ EXDVALUES <i>value</i> _____

The following shows the relationship between the parameters in the TEST statement and the parameters in the selection test prompt:

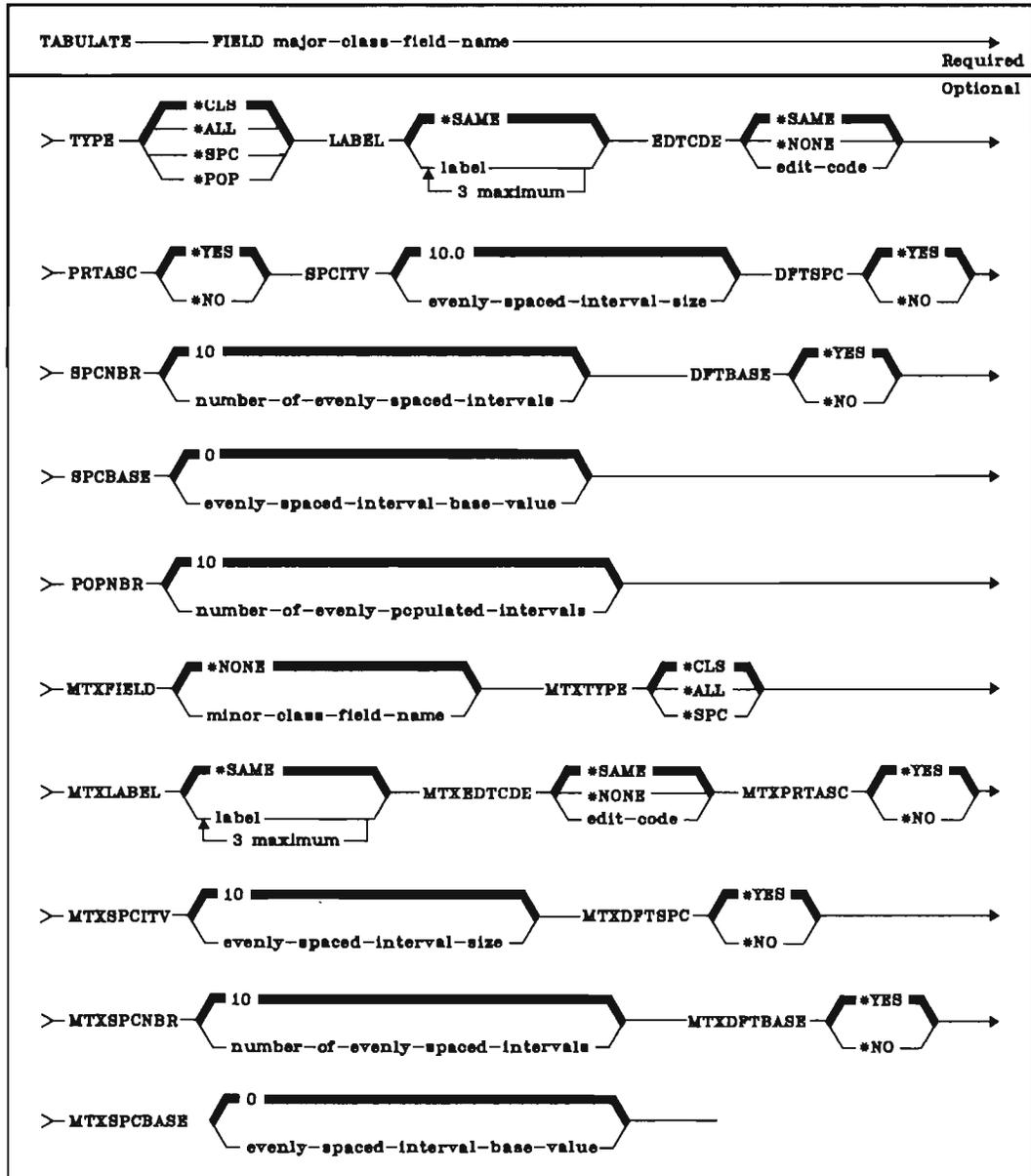
TEST Statement Parameter	Corresponding Parameter in the Selection Test Prompt
FIELD	FIELD NAME
REL	REL
EXDVAL	VALUES

Note: Applications written under early releases of this product use the parameter VALUES instead of EXDVAL. Query accepts either parameter name.

TABULATE (Tabulate) Statement

Unless QRYFLD statements are used, at least one TABULATE statement is required for every QRYFMT statement included in a definition (QRYFLD and QRYFMT are described in preceding paragraphs). The TABULATE statement requires at least one TABCMPT statement. If TYPE(*CLS) is specified in a TABULATE statement, at least one TABCLS statement is required. If MTXTYPE(*CLS) is specified in a TABULATE statement, at least one TABCLSMTX statement is required. TABCMPT, TABCLS, and TABCLSMTX are described in following paragraphs.

The TABULATE statement defines the major class field for a table and can also define a minor class field for the table. TABULATE statements must follow the QRYFMT statement that identifies the record format containing the specified class field(s). The TABULATE statement corresponds to the query definition, table class definition, and extended print classes prompts.



The following charts show the relationship between the parameters in the TABULATE statement and the parameters in the query definition, table class definition, and extended print classes prompts for major and minor classes:

Major Classes	
TABULATE Statement Parameter	Corresponding Parameter
FIELD	TABLE (query definition prompt).
TYPE	The four primary options on the table class definition prompt: *CLS = Tabulate on values specified in next prompt *ALL = Tabulate for every value that occurs in the data *SPC = Tabulate into evenly spaced intervals *POP = Tabulate into evenly populated intervals
LABEL	Label classes (extended print classes prompt—up to three values containing a maximum of 20 characters each).
EDTCDE	Edit code (extended print classes prompt). This parameter is ignored if TYPE(*CLS) is specified.
PRTASC	Print ascending (extended print classes prompt).
SPCITV	Interval size (table class definition prompt).
DFTSPC	Default intervals (table class definition prompt).
SPCNBR	Interval value (entered after <i>enter value</i> on table class definition prompt if not defaulted). This parameter is ignored if DFTSPC(*YES) is specified.
DFTBASE	Default base value (table class definition prompt).
SPCBASE	Base value (entered after <i>enter value</i> on table class definition prompt if not defaulted). This parameter is ignored if DFTBASE(*YES) is specified.
POPnbr	Number of intervals (table class definition prompt).

Minor Classes	
TABULATE Statement Parameter	Corresponding Parameter
MTXFIELD	Minor class name (table class definition prompt).
MTXTYPE	The first three primary options on the table class definition prompt: <u>*CLS</u> = Tabulate on values specified in next prompt *ALL = Tabulate for every value that occurs in the data *SPC = Tabulate into evenly spaced intervals
MTXLABEL	Label classes (extended print classes prompt—up to three values containing a maximum of 20 characters each).
MTXEDTCDE	Edit code (extended print classes prompt). This parameter is ignored if MTXTYPE(*CLS) is specified.
MTXPRTASC	Print ascending (extended print classes prompt).
MTXSPCITV	Interval size (table class definition prompt).
MTXDFTSPC	Default intervals (table class definition prompt).
MTXSPCNBR	Interval value (entered after <i>enter value</i> on table class definition prompt if not defaulted). This parameter is ignored if MTXDFTSPC(*YES) is specified.
MTXDFTBASE	Default base value (table class definition prompt).
MTXSPCBASE	Base value (entered after <i>enter value</i> on table class definition prompt if not defaulted). This parameter is ignored if MTXDFTBASE(*YES) is specified.

TABCLS (Major Table Class) Statement

At least one TABCLS statement is required for each TABULATE statement that specifies TYPE(*CLS). (TABULATE is described in a preceding paragraph.) Each TABCLS statement defines one class value for the major class field defined by the preceding TABULATE statement. TABCLS statements must follow the TABULATE statement that identifies the major class field for which class values are being defined. Each TABCLS statement corresponds to one line on the class value definition prompt for major classes.

Required
TABCLS ——— REL relational-operator ——— EXDVALUES value ———

The following shows the relationship between the parameters in the TABCLS statement and the parameters in the class value definition prompt:

TABCLS Statement Parameter	Corresponding Parameter in the Class Value Definition Prompt
REL	REL
EXDVALUES	VALUES (a maximum of 20 values, depending on the relational operator specified)

Note: Applications written under early releases of this product use the parameter VALUES instead of EXDVAL. Query accepts either parameter name.

TABCLSMTX (Minor Table Class) Statement

At least one TABCLSMTX statement is required for each TABULATE statement that specifies MTXTYPE(*CLS). (TABULATE is described in a preceding paragraph.) Each TABCLSMTX statement defines one class value for the minor class field defined by the preceding TABULATE statement. TABCLSMTX statements must follow the TABULATE statement that identifies the minor class field for which class values are being defined. Each TABCLSMTX statement corresponds to one line on the class value definition prompt for minor classes.

Required
TABCLSMTX ——— REL relational-operator ——— EXDVALUES value ———

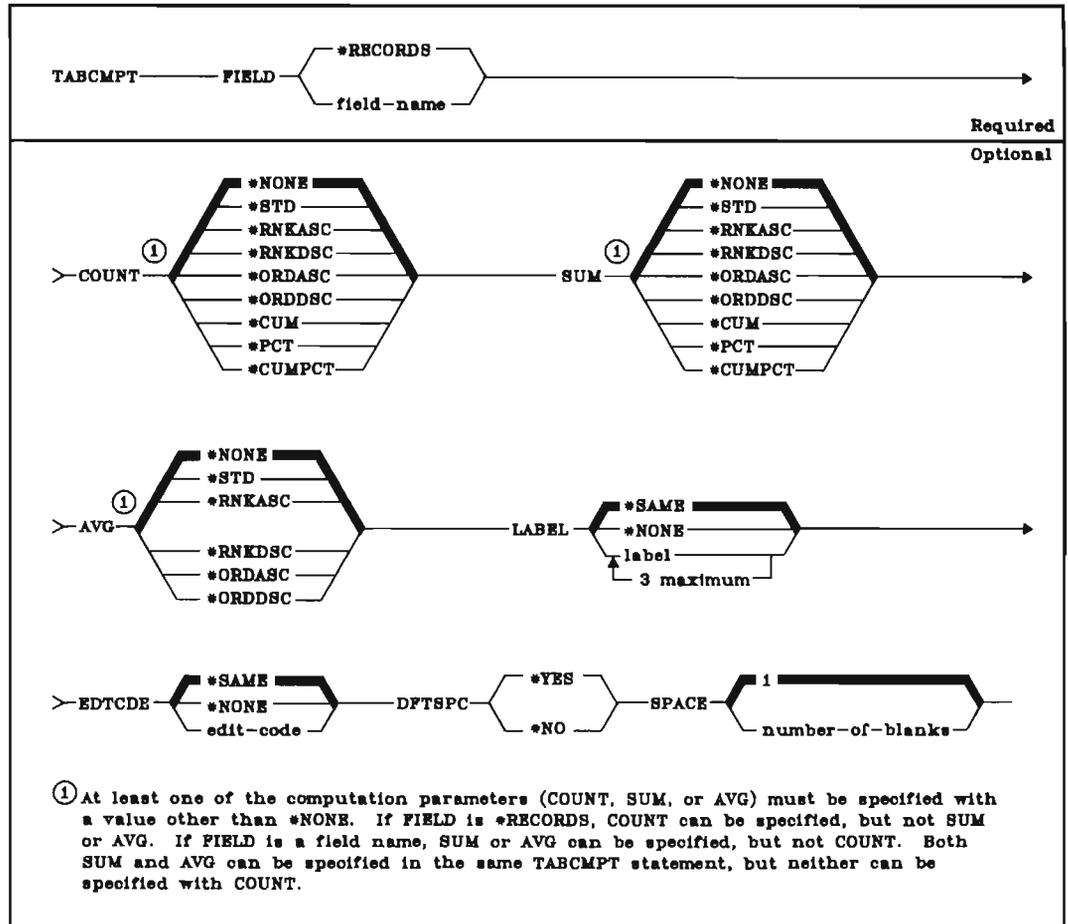
The following shows the relationship between the parameters in the TABCLSMTX statement and the parameters in the class value definition prompt:

TABCLSMTX Statement Parameter	Corresponding Parameter in the Class Value Definition Prompt
REL	REL
EXDVALUES	VALUES (a maximum of 20 values, depending on the relational operator specified)

Note: Applications written under early releases of this product use the parameter VALUES instead of EXDVAL. Query accepts either parameter name.

TABCMPT (Table Computation) Statement

At least one TABCMPT statement is required for each TABULATE statement (TABULATE is described in a preceding paragraph). The TABCMPT statement defines computation to be performed on a field. The results of the computation are to be included for each class in a table. TABCMPT statements must follow the TABULATE statement that identifies the class field(s) for the table that is to contain the computations. The TABCMPT statement corresponds to the table computation, extended table computation, and extended print computed values prompts.



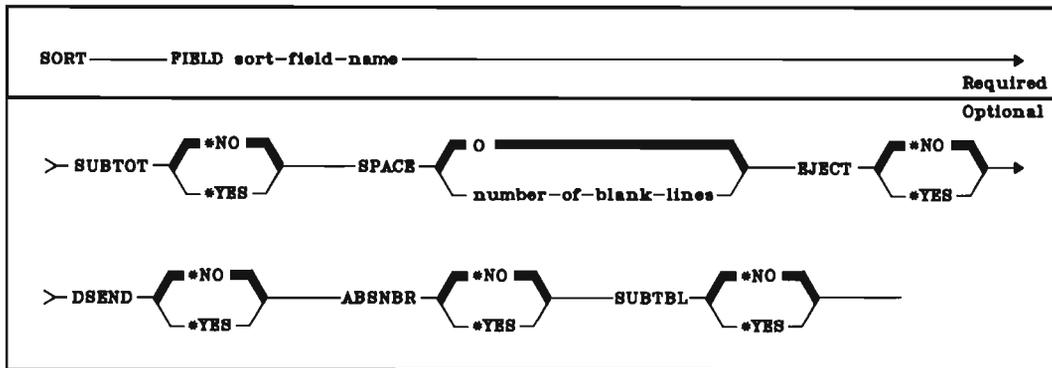
The following shows the relationship between the parameters in the TABCMPT statement and the parameters in the table computation, extended table computation, and extended print computed values prompts:

TABCMPT Statement Parameter	Corresponding Parameter
FIELD	*RECORDS is equivalent to <i>Count records</i> : *YES on the table computation prompt. Field-name is equivalent to an entry under FIELD NAME on the table computation prompt.
COUNT	<p>The following values are equivalent to <i>Count records</i>: *YES on the table computation prompt as well as the indicated parameters on the extended table computation prompt for COUNT:</p> <ul style="list-style-type: none"> *STD = Print the computed number *RNKASC = Print the rank of the number (low number is rank 1) *RNKDSC = Print the rank of the number (high number is rank 1) *ORDASC = Order the printing by the rank of the number (low first); valid only for tables that do not have minor classes *ORDDSC = Order the printing by the rank of the number (high first); valid only for tables that do not have minor classes *CUM = Print a cumulative number *PCT = Print the number as a percentage *CUMPCT = Print the cumulative number as a percentage
SUM	<p>The following values are equivalent to specifying SUM or XSUM for a field on the table computation prompt as well as to the indicated parameters on the extended table computation prompt for SUM:</p> <ul style="list-style-type: none"> *STD = Print the computed number *RNKASC = Print the rank of the number (low number is rank 1) *RNKDSC = Print the rank of the number (high number is rank 1) *ORDASC = Order the printing by the rank of the number (low first); valid only for tables that do not have minor classes *ORDDSC = Order the printing by the rank of the number (high first); valid only for tables that do not have minor classes *CUM = Print a cumulative number *PCT = Print the number as a percentage *CUMPCT = Print the cumulative number as a percentage
AVG	<p>The following values are equivalent to specifying AVG or XAVG for a field on the table computation prompt as well as to the indicated parameters on the extended table computation prompt for AVG:</p> <ul style="list-style-type: none"> *STD = Print the computed number *RNKASC = Print the rank of the number (low number is rank 1) *RNKDSC = Print the rank of the number (high number is rank 1) *ORDASC = Order the printing by the rank of the number (low first); valid only for tables that do not have minor classes *ORDDSC = Order the printing by the rank of the number (high first); valid only for tables that do not have minor classes
LABEL	Label (extended print computed values prompt).
EDTCDE	Edit code (extended print computed values prompt).
DFTSPC	Default spacing (extended print computed values prompt).
SPACE	Number of spaces (extended print computed values prompt).

SORT (Sort) Statement

If the sort order for the query application is to be different from the order defined by DDS for the file, at least one SORT statement is required in the definition of the application. If SORT statements are used, one SORT statement is required for each QRYFMT statement (QRYFMT is described in a preceding paragraph).

Each SORT statement defines a sort key field. The SORT statement(s) for a record format must follow the QRYFMT statement that identifies the record format. The first SORT statement for the record format must define the primary sort field, the second SORT statement must define the second sort field, the third SORT statement must define the third sort field, and so on. Each SORT statement corresponds to one line on the sort specification prompt, which is described in detail earlier in this chapter.



The following shows the relationship between the parameters in the SORT statement and the parameters in the sort specification prompt:

SORT Statement Parameter	Corresponding Parameter in the SORT Specification Prompt
FIELD	FIELD
SUBTOT	SUBTOTAL
SPACE	SPACE
EJECT	EJECT
DSEND	DSCEND
ABSNBR	ABSNBR
SUBTBL	SUBTABLE

Sample UDS Statements

Following is a listing of source UDS for Example 6 in Chapter 3. The listing shows the statements that result from the responses entered in Example 6.

```
EXTENDED UDS SOURCE RECORDS
SEQ NUMBER -----1-----2-----3-----4-----5-----6-----7-----8
0001.00 QRYAPP FILE(ORDCJSL,QGPL) TITLE('EXAMPLE6')
0002.00 OUTPUT COVER('CUSTOMER ORDERS') HEAD('ORDER FILE QUERY') DTLLST(=NO)
0003.00 QRYFMT RCD(FMT(ORDHDR))
0004.00 QRYFLD FIELD(CUST)
0005.00 QRYFLD FIELD(ORDER)
0006.00 QRYFLD FIELD(ORDSTS)
0007.00 QRYFLD FIELD(ORDAMT)
0008.00 QRYFLD FIELD(CUSTYP)
0009.00 QRYFLD FIELD(OPNSTS)
0010.00 QRYFLD FIELD(TOTLIN)
0011.00 QRYFLD FIELD(INVNUM)
0012.00 QRYFLD FIELD(ACTMTH)
0013.00 QRYFLD FIELD(ACTYR)
0014.00 QRYFLD FIELD(STATE)
0015.00 RCDSEL LOGIC(*SELECT)
0016.00 TEST FIELD(CUSTYP) REL(*LS) VALUES(1 2 3)
0017.00 SORT FIELD(CUST)
0018.00 SORT FIELD(ORDER)
0019.00 TABULATE FIELD(ORDAMT) TYPE(*SPC) SPLITV(500,00) DFTSPC(=NO) SPONBR(4) *
      DFTBASE(=NO) MTXFIELD(CUSTYP) MTXTYPE(*CLS)
0020.00 TABCLSMTX REL(*EQ) VALUES(1)
0021.00 TABCLSMTX REL(*EQ) VALUES(2)
0022.00 TABCLSMTX REL(*EQ) VALUES(3)
0023.00 TABCMPT FIELD(*RECORDS) COUNT(*STD) LABEL('RECORDS')
0024.00 TABCMPT FIELD(ORDAMT) AVG(*STD)
***** APPLICATION EXAMPLE6 WAS CREATED ON LIBRARY QGPL
***** END OF UDS SOURCE LISTING *****
```

Following are source UDS statements that were entered to define a query application, and a listing of those statements that was provided when the CRTQRYAPP (Create Query Application) command was entered to create an application.

Notice that the order of the statements in the listing is different from the order in which the statements were entered. IDU determines the listed order of UDS statements. For example, the query SORT UDS statement is always listed just before any table UDS statements.

SOURCE FILE QUDSSRC.QIDU	MEMBER Q7	ADDS 4	DELETES 0	CHANGES 9	MOVES 3	APPLICATION QSEUGRY.QIDU		
SEQUENCE	1	2	3	4	5	6	7	8
1.00	QRYAPP	CUSMSTP						
2.00	QRYFMT	CUSMST						
3.00	COMPUTE	REGION				*ZIP/1000-ZIP//1000*		
4.00	TABULATE	REGION				*CLS MTXTYPE(*CLS) MTXFIELD(CUTYPE)		
5.00	TABCMP	*RECORDS				COUNT(*STD)		
6.00	TABCLS	*RG				(51 52)		
7.00	TABCLS	*GE				53		
8.00	TABCLSMTX	*EQ				2		
9.00	TABCLSMTX	*EQ				3		
10.00	TABCLSMTX	*EQ				4		
11.00	TABCLSMTX	*EQ				9		
12.00	QRYFLD	ZIP						
13.00	QRYFLD	REGION						
14.00	QRYFLO	CUTYPE						
15.00	RCDSSEL	*SELECT						
16.00	TEST	ZIP				*RG (50000 60000)		
17.00	SORT	ZIP						
18.00	RCDSMP	NBRRCDS				(1000)		
19.00	OUTPUT	HEAD				(*CUSTOMER TYPE BY REGION*)		

5714UT1

UTILITY DEFINITION STATEMENTS

EXTENDED UDS SOURCE RECORDS

SEQ NUMBER	1	2	3	4	5	6	7	8
0001.00	QRYAPP	FILE(CUSMSTP)	TITLE(*Q7*)					
0002.00	OUTPUT	HEAD	(*CUSTOMER TYPE BY REGION*)					
0003.00	RCDSMP	NBRRCDS	(1000)					
0004.00	QRYFMT	RCDFMT	(CUSMST)					
0005.00	COMPUTE	FIELD(REGION)	VALUE(*ZIP/1000-ZIP//1000*)					
0006.00	QRYFLD	FIELD(ZIP)						
0007.00	QRYFLD	FIELD(REGION)						
0008.00	QRYFLD	FIELD(CUTYPE)						
0009.00	RCDSSEL	LOGIC(*SELECT)						
0010.00	TEST	FIELD(ZIP)	REL(*RG) VALUES(50000 60000)					
0011.00	SORT	FIELD(ZIP)						
0012.00	TABULATE	FIELD(REGION)	TYPE(*CLS) MTXFIELD(CUTYPE) MTXTYPE(*CLS)					
0013.00	TABCLS	REL(*RG)	VALUES(51 52)					
0014.00	TABCLS	REL(*GE)	VALUES(53)					
0015.00	TABCLSMTX	REL(*EQ)	VALUES(2)					
0016.00	TABCLSMTX	REL(*EQ)	VALUES(3)					
0017.00	TABCLSMTX	REL(*EQ)	VALUES(4)					
0018.00	TABCLSMTX	REL(*EQ)	VALUES(9)					
0019.00	TABCMP	FIELD(*RECORDS)	COUNT(*STD) LABEL(*RECORDS*)					
***** APPLICATION Q7 WAS CREATED ON LIBRARY QGPL								
***** E N D O F U O S S O U R C E L I S T I N G *****								

Enter UDS Source

After you compose UDS statements for a query application, store them in a source file. You can use CPF commands to create a source file and to copy the statements into the file. See the *CPF Programmer's Guide* for a description of how to create files and how to place information into files.

You can also use the source entry utility (SEU) portion of IDU to create a member in an existing source file and enter source statements into the member interactively. Although SEU does not help you code UDS statements, SEU checks the syntax of each UDS statement when you enter the statement.

SEU is described in the *SEU Reference Manual and User's Guide*. The name of the SEU application to use to enter query UDS statements is QSEUQRY.

Create an Application from UDS Source

Entering of CRTQRYAPP

When the UDS statements for a definition are in a source file, request query by entering the CRTQRYAPP command.

Because user interaction is not required during the creation of an application from a stored definition, you can enter the CRTQRYAPP command in one of two ways: (1) enter the command interactively from a work station, or (2) submit the command in a batch job. To submit the command in a batch job, use the //JOB (Job) or SBMJOB (Submit Job) command.

Batch jobs are described in the *CPF Programmer's Guide*. The //JOB and SBMJOB commands are described in the *CL Reference Manual*.

Batch entry of the CRTQRYAPP command offers the following advantages over interactive entry of CRTQRYAPP:

- Work station time is used more efficiently. If CRTQRYAPP is entered interactively, the work station from which it is entered is inoperable from the time the command is entered until the time the application is created.
- System performance may be improved because the request for creation of the application is placed in the system storage pool for batch jobs.

Execution of CRTQRYAPP

When the CRTQRYUAPP command is executed, query reads the source file member specified in the command. The member must contain your UDS statements. If query finds errors in the statements, query does not create an executable application, but prints message identifiers in a listing of the UDS statements. Use the message identifiers to find the corresponding error messages in the *Messages Guide: CPF, RPG III, and IDU*. Then, you can use the source entry utility (SEU) to display and correct the UDS statements that contain errors.

If no errors are found in your UDS statements, query prints a source listing and creates an executable query application.

Chapter 12. Problem Determination Procedure

If a problem occurs while you are using query, the cause of your problem might not be immediately apparent. An error in your application, in system operation, or in query could have caused the problem. The problem determination procedure in this chapter helps you isolate the cause of your problem and tells you what you can do to solve it. If you need to call for service in order to solve the problem, this procedure tells you what information you should collect for your service representative so the problem can be fixed in the shortest possible time.

How to Use This Procedure

This procedure is arranged in a sequence of questions that you can answer with a **Yes** or **No**. Based on your answer, you are directed to another question or to a recommendation for action.

Start at the beginning of the procedure and follow the question-and-answer sequence, answering each question to which you are directed based on your previous answer. If the problem is a condition that requires more detailed procedures, you are referred to those procedures.

Detailed Procedures

1 Did you receive a message, such as: an operator needs to do something to a device?

No Yes

Take the actions indicated by the message and save any automatic dumps printed as a result of the message. If the action requires operator action, call your system operator. If the action requires you to call for help, see *Calling for Help* at the end of this procedure.

When you examine a message for indicated actions, check the following:

- Second-level message text, which describes the message in more detail. To get the second-level message text, display the message on your screen (Display Message, DSPMSG command), position the cursor under the message, and press the Help key.
- PDP code associated with the message, which suggests error recovery actions. To find the PDP code for the message, look up the message in the messages listing in the (Messages guide name), and find the PDP code. Then go to Chapter X of that manual for an explanation of that code.
- Other messages referred to in the second-level message text. The information in these messages could help you solve your problem.

If you still cannot solve your problem after fully examining the message, go to *Calling for Help* at the end of this procedure.

2 Are other system users having problems communicating with the system?

No Yes

Call your system operator and describe the problem. Have your operator use the procedures in the *Problem Determination Guide*.

3 Is this the first time you have ever run the job or function or the first time you have run the job or function after making changes to it?

Yes No

You have a system problem. Call your system operator, describe your problem and have the operator use the *Job or Function Does Not Work* procedure in the *Problem Determination Guide*.

A

A

4 Are you having a nonprogramming problem, such as spooled output that is not produced or a device that is not working?

No Yes

You have a system problem. Call your system operator and have the operator use the appropriate procedure in the *Problem Determination Guide*.

5 Has the Input Inhibited (■) indicator stayed on longer than expected?

No Yes

Press the Error/Reset key. If the indicator does not turn off, do the following:

- Press the System Request key. When the system request menu appears, create a second interactive job.

or

- Go to another work station and sign on to create a second interactive job.

Enter the Display Subsystems (DSPSBS) command to request the subsystems display. On that display, look for a job entry that has the same job name as the work station with the problem. (If two entries are shown, look at both.) Record these names.

Does the job entry (or entries) indicate a status of HELD?

No Yes

Enter a 6 in the input field beside the job name to release the job.

You could have a loop or wait condition. Do the following to gather helpful information and cancel the failing job:

1. Enter the Display Job (DSPJOB) command choosing the following options for command parameters:

Parameter		Value
Job name	JOB	Work station ID for the failing job
User name		User name, as the system recognizes that name
Job number		The job number you recorded earlier
Output	OUTPUT	*LIST to print your job information for later use

A



A

2. When the display job menu appears, select option 5—job invocation stack. When you press the Enter key, the invocation stack for the failing job will be printed.

The invocation stack will tell you which instruction your program or application is currently on. When you compare this information with your original listing, you can determine why the loop or wait occurred.

3. Press the CF1 key to return to the command entry display.
4. Enter the Cancel Job (CNLJOB) command to cancel the failing job. For instance:

```
CNLJOB JOB(WS1.QUSER.oo8299)
```

Check with the system operator to see that the job log for the failing job is printed.

The job log is a record of each program action and any messages resulting from these program actions.

Note: Your job log should be printed if you use the default value for the Log Limit (LOGLMT) parameter on the CNLJOB command. However, if your job description specifies a 0 for the message level in the LOG parameter, no job log will be printed.

5. Examine your job log, invocation stack, and program listing to determine why the problem occurred.

If this fails to solve your problem, see *Calling for Help* at the end of this procedure.

A

A

6 Is your program producing unexpected results?

No Yes

You can do the following to determine why this happened.

1. Get a listing of your program.
2. Get the job log for your job by choosing LOG(*LIST) when you sign off, for instance:

SIGNOFF LOG(*LIST)

Your job log will be written to a spooled output file.

Your job log is a record of each job action and any messages received by your job in the order they occurred.

3. Use the CPF debugging functions, such as traces and breakpoints, to isolate specific problems in operation. CPF debugging functions are described in the *CPF Programmer's Guide*.

If this procedure fails to solve your problem, see *Calling for Service* at the end of this procedure.

7 You have a problem that requires additional assistance.

Go to *Calling for Help* at the end of this procedure.

Calling for Help

Do the following when you require additional assistance:

1. Cancel the failing job and print the job log, if you have not already done so. Do this by signing off your work station and choosing *LIST for the OUTPUT parameter. For instance:

SIGNOFF LOG(*LIST)

Call your system operator to verify that the job log was printed.

2. Examine the job log, and any other available information on your job, to determine why your problem occurred. If you still require additional assistance, go to the next step.
3. Have your system operator go to the *Before Calling for Service* procedure in the *Problem Determination Guide*.

Appendix A. DDS for Examples

The following is the DDS for the IBM-supplied example file QORDERS. This example file is used in Chapters 1 and 3 in this manual.

IBM International Business Machines Corporation

DATA DESCRIPTION SPECIFICATIONS

GX21-7754-1 UM/050*
Printed in U.S.A.

File	Keying Instruction	Graphic								Description	Page	of
Programmer	Date	Key										

Sequence Number	Form Type	And/Or Comment (A/O/O')	Conditioning				Name Type (M/R/K/S/O) Reserved	Name	Length	References (R)	Data Type (A/P/S/B/A/S/X/N/I/M) Decimal Positions	Usage (I/O/I/B/N/M)	Location		Functions
			Indicator	Not (N)	Indicator	Not (N)							Line	Pos	
1	A						ORDHDR								TEXT('Order file header record')
2	A						CLUST	5A							COLHDG('CUSTOMER' 'NUMBER')
3	A						ORDER	5P 0							TEXT('Customer number')
4	A						ORDDAT	6P 0							COLHDG('ORDER' 'NUMBER')
5	A						ORDDAT	6P 0							TEXT('Order number')
6	A						ORDDAT	6P 0							COLHDG('ORDER' 'DATE')
7	A						ORDDAT	6P 0							TEXT('Date order was entered')
8	A						CUSORD	15A							EDTCDE(Y)
9	A						CUSORD	15A							COLHDG('CUSTOMER' 'P.O.#')
10	A						CUSORD	15A							TEXT('Customer purchase order - number')
11	A						BHPVIA	15A							COLHDG('SHIPPING' 'INSTRUCTIONS')
12	A						BHPVIA	15A							TEXT('Shipping instructions')
13	A						ORDSTS	1P 0							COLHDG('ORDER' 'STATUS')
14	A						ORDSTS	1P 0							TEXT('Order status')
15	A						OPRNAM	10A							COLHDG('OPERATOR' 'NAME')
16	A						OPRNAM	10A							TEXT('Operator name')
17	A						ORDAMT	8P 2							COLHDG('ORDER' 'AMOUNT')
18	A						ORDAMT	8P 2							TEXT('order amount')
19	A						ORDAMT	8P 2							EDTCDE(I)
20	A						CUSTYP	1P 0							COLHDG('CUSTOMER' 'TYPE')
21	A						CUSTYP	1P 0							TEXT('customer type: 1=Gov 2=Sch - 3=Bus 4=Pvt 5=oth')
22	A						OPNSTS	1P 0							COLHDG('OPEN' 'STATUS')
23	A						OPNSTS	1P 0							TEXT('Open order status: - 1=Open 2=Closed 3=Cancelled')
24	A						TOTLIN	3P 0							COLHDG('TOTAL' 'LINES')
25	A						TOTLIN	3P 0							TEXT('Total items in order')
26	A						INVNUM	5P 0							COLHDG('INVOICE' 'NUMBER')
27	A						INVNUM	5P 0							TEXT('Invoice number')
28	A						PRIDAT	6P 0							COLHDG('PRINTED' 'DATE')
29	A						PRIDAT	6P 0							TEXT('Date order was printed')
30	A						PRIDAT	6P 0							EDTCDE(Y)
31	A						ACTMTH	2P 0							COLHDG('ACCTG' 'MTH')
32	A						ACTMTH	2P 0							TEXT('Accounting month of sale')
33	A						ACTYR	2P 0							COLHDG('ACCTG' 'YEAR')
34	A						ACTYR	2P 0							TEXT('Accounting year of sale')
35	A						STATE	2A							COLHDG('STATE')
36	A						STATE	2A							TEXT('State abbreviation')
37	A						CLUST								
38	A						ORDER								SIGNED

*Number of sheets per pad may vary slightly



Appendix B. Service Information

This appendix is provided for service personnel to use when investigating query problems.

Query users can also use this appendix to investigate query problems on their own before, or instead of, calling for service.

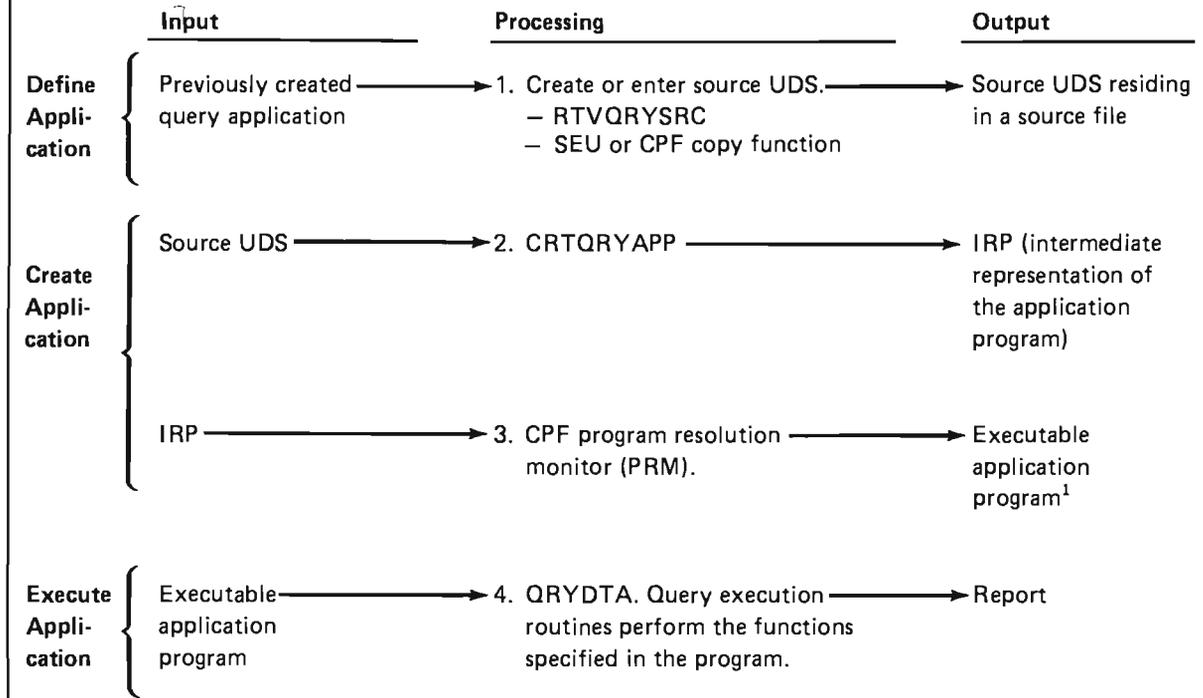
QUERY OVERVIEW

This section provides the following information about query:

- How query creates and executes an application
- Query module organization
- Major query data areas

How Query Creates and Executes an Application

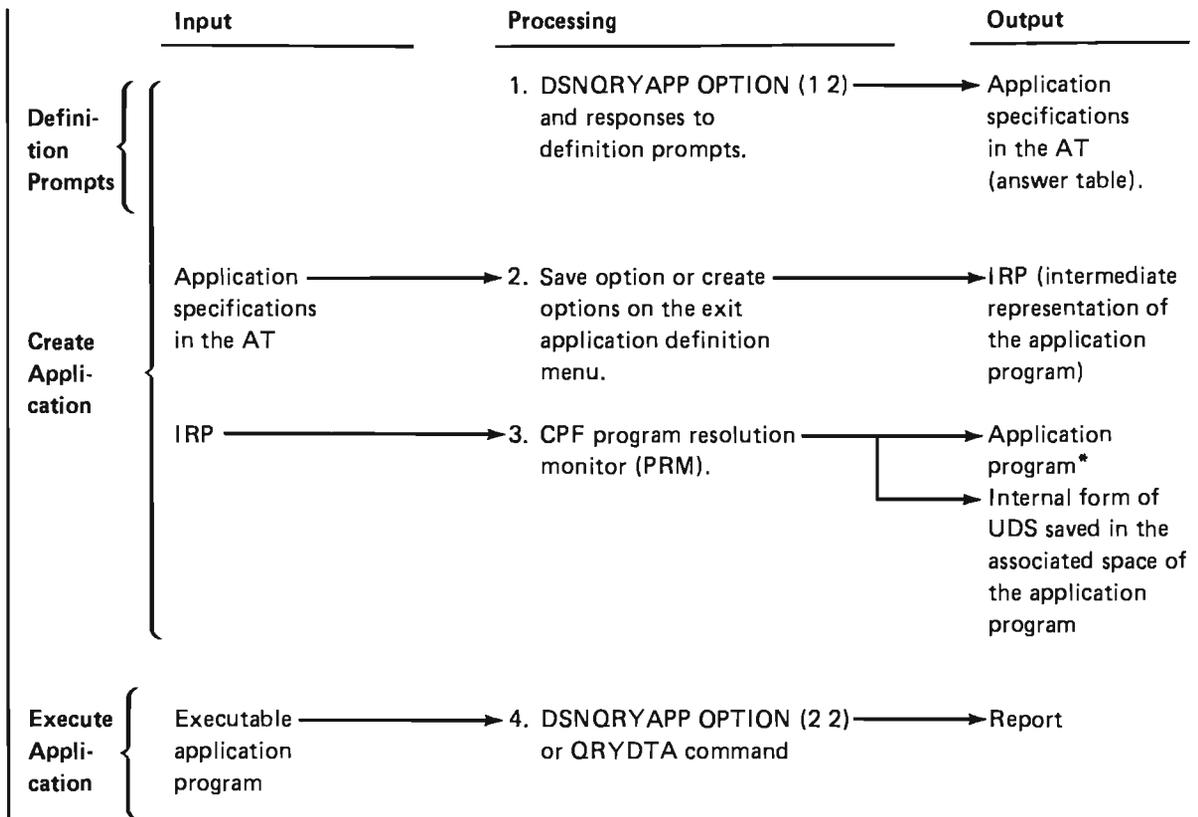
Figure B-1 is an internal view of how query creates an executable application from UDS source statements entered directly. Figure B-2 is an internal view of how query creates an executable application from responses to interactive definition prompts. These figures also show how query executes an application.



¹ DLTQRYAPP deletes the program for an application.

Figure B-1. Query Processing with UDS directly entered

- Notes:**
- The source UDS created in step 1 of Figure B-1 can be listed by specifying OPTION(*SOURCE or *SRC) on the CRTQRYAPP command.
 - A formatted listing of IRP as it is received by PRM in step 4 can be obtained by specifying GENOPT(*LIST) on the CRTQRYAPP command, or by selecting the corresponding option on the create application prompt.
 - The application program template created as part of step 4 can be dumped by specifying GENOPT(*DUMP) on the CRTQRYAPP command.



*Save option produces a nonexecutable application program.

Figure B-2. Query processing with interactive definition

- Notes:**
- The UDS produced in step 3 can be listed by specifying YES for source listing on the save application prompt or the application creation prompt.
 - A formatted listing of the IRP as it is received by the PRM in step 3 can be obtained by specifying YES for Generated code listing on the application creation prompt.
 - The application program template created in step 3 can be dumped by specifying YES for Dump internal data areas on the application creation prompt.

Query Module Organization

Query module organization is summarized here. For an overview of the control flow between IDU modules, see module QWUXDOC in the IDU microfiche.

Summary of Command Processing Modules

Command	Controlling Module
CHGQRYDEF	QWUXXCHD
CRTQRYAPP	QWUXXCRT
CRTQRYDEF	QWUXXCRD
DLTQRYAPP	QWUQUDLA
DSNQRYAPP	QWUMXCPP
QRYDTA	QWUQCQD
RTVQRYSRC	QWUQURTV

Principal Definition and Create/Delete Application Modules

Module	Description
QWUPQDRV	Definition controller
QWUQUGA	Fast-path answer table generation
QWUQUGEN	Generate application from answer table
QWUQUGPG	Generate program
QWUQUGPT	Generate program
QWUQUGSB	Generate program for table and subtable processing
QWUQUGSC	Generate program for table and subtable processing
QWUQUGST	Generate program subtotal and total processing
QWUQUGS1	Generate program for table and subtable processing
QWUQUGS2	Generate program for table and subtable processing
QWUQUGS3	Generate program for table and subtable processing
QWUQUGTB	Generate program for table and subtable processing
QWUQUPC	Answer table procedure checker
QWUQUPL	Printer layout
QWUQU TL	Table layout
QWUQUVC	Answer table unit validity checker

Principal Execution Modules

Module	Description
QWUQCQD	QRYDTA control processing program
QWUQUJOB	Execution controller
QWUQUDRV	Execution controller
QWUQUIX	Independent index build for sorts
QWUQU PF	File processing controller

Major Query Data Areas

A brief description of the major query data areas is given here. For a detailed description of the data areas, see the module QWUXXDOC in the IDU microfiche.

Application Definition and Creation Data Areas

Answer Table (AT): The answer table (AT) holds the internal representation of the UDS for the user's application. AT consists of a header and subsequent units. Each unit represents one UDS source statement. Each unit is built either from a UDS source statement after entry of the CRTQRYAPP command, or from one or more completed definition prompts after entry of the DSNQRYAPP command.

Global Communications Area (GCA): The global communications area (GCA) contains control information that is used and updated during application definition and creation. Initialization of GCA occurs in the CPF command processing program (CPP) for the command being executed.

Message Stack (MS): The message stack (MS) is used during definition of an application. MS contains error messages and substitution text for listing or displaying messages.

Record/Field List (RFL): The record/field list (RFL) contains the internal representation of the data base file that is to be used by the query application. RFL contains information for each record format and field within the file.

Execution Data Areas

Global Communications Area (GCA): The global communications area (GCA) contains control information that is used and updated during application execution. Initialization of GCA occurs in the CPF command processing program (CPP) for the command being executed.

Query Application Control Block (QACB): The query application control block (QACB) is the communications interface between the generated application and the execution support modules.



The System/38 glossary defines terms that are used in the customer documentation for System/38.

This glossary includes definitions developed by the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO). This material is reproduced from the *American National Dictionary for Information Processing*, copyright 1977 by the Computer and Business Equipment Manufacturers Association. Copies of this dictionary may be purchased from the American National Standards Institute, 1430 Broadway, New York, New York 10018. Definitions from this dictionary are identified by (ANSI) at the beginning of the definition.

alphabetic character: (1) Any one of the letters A through Z (uppercase and lowercase) or one of the characters #, \$, or @. (2) In COBOL, a character that is one of the 26 uppercase characters of the alphabet, or a space.

alphanumeric character: Any one of the alphabetic characters, one of the digits 0 through 9, or the character _ (underscore) as defined in CPF.

APAR: See *authorized program analysis report*.

application: (1) A particular data processing task, such as an inventory control application or a payroll application. (2) In IDU, specialized program created by IDU from user input. An application is later called by DFU or the query utility.

arrival sequence access path: An access path that is based on the order in which records are stored in a physical file. Contrast with *keyed sequence access path*.

attribute: A characteristic; for example, attributes of a field include its length and data type, and attributes of a job include its user name and job date.

authority: The right to access objects, resources, or functions.

authorization: The process of giving a user either complete or restricted access to an object, resource, or function.

authorized program analysis report: A request for correction of a problem caused by a defect in a current unaltered release of a program. Abbreviated APAR.

batch job: A group of processing actions submitted as a predefined series of actions to be performed with little or no interaction between the user and the system.

batch processing: A method of executing a program or a series of programs in which one or more records (a batch) is processed with little or no interaction with the user or operator. Contrast with *interactive processing*.

CF key: See *command function key*.

character: Any letter, digit, or other symbol in the data character set that is part of the organization, control, or representation of data.

character field: An area that is reserved for a particular unit of information and that can contain any of the characters in the data character set. Contrast with *numeric field*.

character string: A string consisting of any of the 256 EBCDIC characters that are used as a value.

CL: See *control language*.

command: A statement used to request a function of the system. A command consists of the command name, which identifies the requested function, and parameters.

command function key: At a work station, a keyboard key that is used with the command (CMD) function control key to request preassigned functions. At the system console, a keyboard key, called a CF key, that is used to request preassigned functions.

control language: The set of all commands with which a user requests functions. Abbreviated CL.

Control Program Facility: The system support licensed program for System/38. It provides many functions that are fully integrated in the system such as work management, data base data management, job control, message handling, security, programming aids, and service. Abbreviated CPF.

CPF: See *Control Program Facility*.

create: To bring an object into existence in the system.

cursor: A movable spot of light, resembling a bright underscore, that shows where the next character will appear on the work station screen when a key on the keyboard is pressed.

data base file: An object that contains descriptions of how input data is to be presented to a program from internal storage and how output data is to be presented to internal storage from a program. See also *physical file* and *logical file*.

data description specifications: A description of the user's data base or device files that is entered into the system using a fixed-form syntax. The description is then used to create files. Abbreviated DDS.

data file: Any nonsource file. A data file is created by the specification of FILETYPE(*DATA) on a create file command.

data file utility: The utility of the Interactive Data Base Utilities licensed program that is used to create, maintain, and display records in a data base file. Abbreviated DFU.

data rights: The authority to read, add, update (modify), or delete data contained in an object.

data type: An attribute used for defining data as numeric or character.

DDS: See *data description specifications*.

default value: A value assumed when no value has been specified.

delete: To remove an object or a unit of data (such as character, a field, or a record).

DFU: See *data file utility*.

edit code: A letter or number indicating what kind of editing should be done before a field is displayed or printed.

enter: To press the Enter/Rec Adv key (on a work station keyboard) or the Enter key (on the system console) or a command function key to transfer keyed-in information to the system for processing. See also *key in*.

execute: To cause a program, command, utility, or other machine function to be performed.

field: An area that is reserved and used for a particular item of information.

file: A generic term for the object type that refers to a data base file, a device file, or a set of related records treated as a unit. The system-recognized identifier for the object type is *FILE.

filemember: See *file*.

first-level message: The initial message that is presented to the user. The initial message contains general information or designates an error. contrast with *second-level message*.

fold: To continue data for a line on the following printed or displayed line. Contrast with *truncate*.

function key: A keyboard key that is used to request a specific system function. See also *command function key*.

general-purpose library: The library provided by CPF to contain user-oriented, IBM-provided objects and user-created objects that are not explicitly placed in a different library when they are created. Named QGPL.

generic name: The initial characters common to object names that can be used to identify a group of objects. A generic name ends with an * (asterisk). For example, ORD* identifies all objects whose names begin with the characters ORD.

help text: Information that is associated with an information display, a menu, or a prompt that explains options or values displayed. Help text is requested by pressing the Help key.

IDU: See *Interactive Data Base Utilities*.

Interactive Data Base Utilities: A System/38 licensed program that consists of DFU, SEU, query, and SDA. Abbreviated IDU.

interactive job: A job in which the processing actions are performed in response to input provided by a work station user. During a job, a dialog exists between the user and the system.

interactive processing: Pertaining to a program or procedure that alternately accepts input and then responds to the input. Contrast with *batch processing*.

job: A single identifiable sequence of processing actions that represents a single use of the system. A job is the basic unit by which work is identified on the system.

job date: The date associated with a job. The job date usually defaults to the system date.

job description: An object that contains information defining the attributes of a job. The system-recognized identifier for the object type is *JOBDD.

key field: A field in a record whose contents are used to sequence the records of a particular type within a file member.

key in: The action of pressing keys on a keyboard to specify information that is to be processed. See also *enter*.

keyed sequence: The order in which records appear in an access path. The access path is based on the contents of one or more key fields contained in the records.

library: An object that serves as a directory to other objects. A library is used to group related objects and to find objects by name when they are used. The system-recognized identifier for the object type is *LIB.

library list: An ordered list of library names used to find an object. The library list indicates which libraries are to be searched and the order in which they are to be searched. The system-recognized identifier is *LIBL. *LIBL specifies to the system that a job's current library list is to be used to find the object.

major class field: In the query utility, the field whose contents determine the major, or only, record class in which the query utility processes a record during preparation of a table. Contrast with *minor class field*.

member: A description of a named subset of records in a physical or logical file. Each member conforms to the characteristics of the file and has its own access path. All I/O requests are directed to a specific member of a data base file.

menu: A display in which a list of options is shown.

message: A communication sent from one person or program to another person or program.

minor class field: In the query utility, the field whose contents determine the minor record class in which the query utility processes a record during preparation of a table. Contrast with *major class field*.

numeric character: Any one of the digits 0 through 9.

numeric field: An area that is reserved for a particular unit of information and that can contain only the numeric digits 0 through 9. Contrast with *character field*.

object: A named unit that consists of a set of attributes (that describe the object) and, in some cases, data. An object is anything that exists in and occupies space in storage and on which operations can be performed. Some examples of objects are programs, files, and libraries.

object authority: The right to use or control an object. See *object rights* and *data rights*.

object description: The attributes (such as name, type, and owner name) that describe an object.

object existence rights: The authority to delete, save, free the storage of, restore, and transfer ownership of an object.

object management rights: The authority to move, rename, grant authority to, revoke authority from, and change the attributes of an object.

object owner: A user who creates an object or to whom the ownership of an object has been transferred. The object owner has complete control over the object.

object user: A user who has been authorized by the object owner, the security officer, or a user with object existence rights to perform certain functions on an object.

operational rights: The authority to use an object and to look at its description.

output queue: An object that contains a list of output files to be written to an output device by a writer. The system-recognized identifier for the object type is *OUTQ.

problem determination: The process of determining the source of a problem as a component problem, a machine failure, a common carrier link, a user-supplied element, or a user error.

prompt: A displayed request for information or user action. The user must respond to allow the program to proceed.

public authority: The authority to an object granted to all users.

query: A utility that is part of the Interactive Data Base Utilities licensed program.

query application: See *application*.

record class: In the query utility, one of the distinct groups into which the query utility classifies records during the preparation of a table.

record format: The definition of how data is structured in the records contained in a file. The definition includes the record name, field names, and field descriptions (such as length and data type). The record formats used in a file are contained in the file's description.

result field: In the query utility, a temporary field created by the query utility to contain the results of computations specified in a query application.

second-level message: A message that provides additional information to that already provided in a first-level message. See also *second-level message display*.

second-level message display: A display containing the second-level message text (if any) and additional message information. This display is obtained by pressing the Help key while a first-level message is displayed.

security: The control of access to, or use of, data or functions.

SEU: See *Source entry utility*.

source entry utility: The utility of the Interactive Data Base Utilities licensed program that is used to create and change source members. Abbreviated SEU.

source member: A member of a data base source file that contains source statements such as RPG, COBOL, or DDS specifications. See also *member*.

source statement: A statement written in symbols of a programming language. For example, RPG, COBOL, or DDS specifications are source statements.

system console: The keyboard and display screen on the system unit that serve as a work station for communicating with and controlling the system. See also *operator/service panel* and *work station*.

system date: The date established for the system when it is started.

timestamp: In query, the identification of the day and time a query report was created that query automatically provides on each report.

truncate: To drop data that cannot be printed or displayed in the line width specified or available. Contrast with *fold*.

UDS: See *utility definition specifications*.

user-defined edit code: A number (5 through 9) indicating that editing should be done on a numeric output field according to a pattern predefined to CPF. User-defined edit codes can take the place of edit words, so that repetitive coding of the same edit word is not necessary.

utility definition specification: A group of source statements, which have the same syntax as CL commands, from which a DFU or query application is created. Abbreviated UDS.

work station: A device that lets a person transmit information to or receive information from a computer as needed to perform his job.

work station user: A person who uses a work station to communicate with System/38.

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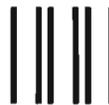
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