This manual provides reference material for the ISQL interactive tool provided in the Dharma SDK. It also includes a tutorial describing how to use the ISQL utility.
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>ISQL Statements for Statement History Support</td>
<td>1-3</td>
</tr>
<tr>
<td>1-2</td>
<td>ISQL Statements for Query Formatting</td>
<td>1-4</td>
</tr>
<tr>
<td>1-3</td>
<td>Numeric Format Strings for the COLUMN Statement</td>
<td>1-19</td>
</tr>
<tr>
<td>1-4</td>
<td>Date-Time Format Strings for the Column Statement</td>
<td>1-19</td>
</tr>
</tbody>
</table>

ISQL Statements for Statement History Support 1-3
ISQL Statements for Query Formatting 1-4
Numeric Format Strings for the COLUMN Statement 1-19
Date-Time Format Strings for the Column Statement 1-19
1-40
Examples

Example 1-1: Unformatted Query Display from ISQL ............................................. 1-5
Example 1-2: Controlling Display Width of Character Columns ................................. 1-6
Example 1-3: Customizing Format of Numeric Column Displays ............................... 1-7
Example 1-4: Specifying Column Breaks and Values with DISPLAY ............................ 1-8
Example 1-5: Calculating Statistics on Column Breaks with COMPUTE ......................... 1-9
Example 1-6: Specifying a Query Header and Footer with TITLE .............................. 1-10
Example 1-7: Sample ISQL script ............................................................................ 1-13

Unformatted Query Display from ISQL 1-5
Controlling Display Width of Character Columns 1-6
Customizing Format of Numeric Column Displays 1-7
Specifying Column Breaks and Values with DISPLAY 1-8
Calculating Statistics on Column Breaks with COMPUTE 1-9
Specifying a Query Header and Footer with TITLE 1-11
Sample ISQL script 1-13
Introduction

PURPOSE OF THIS GUIDE

This manual provides reference material for the ISQL interactive SQL utility provided in the Dharma SDK. It also includes a tutorial describing how to use the ISQL utility.

AUDIENCE

The reader of this manual should be familiar with the concepts described in the Dharma SDK User Guide.

SYNTAX DIAGRAM CONVENTIONS

<table>
<thead>
<tr>
<th>UPPERCASE</th>
<th>Uppercase type denotes reserved words. You must include reserved words in statements, but they can be upper or lower case.</th>
</tr>
</thead>
<tbody>
<tr>
<td>lowercase</td>
<td>Lowercase type denotes either user-supplied elements or names of other syntax diagrams. User-supplied elements include names of tables, host-language variables, expressions and literals. Syntax diagrams can refer to each other by name. If a diagram is named, the name appears in lowercase type above and to the left of the diagram, followed by a double-colon (for example, privilege ::). The name of that diagram appears in lowercase in diagrams that refer to it.</td>
</tr>
<tr>
<td>{}</td>
<td>Braces denote a choice among mandatory elements. They enclose a set of options, separated by vertical bars (</td>
</tr>
<tr>
<td>[]</td>
<td>Brackets denote an optional element or a choice among optional elements.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>A horizontal ellipsis denotes that the preceding element can optionally be repeated any number of times.</td>
</tr>
<tr>
<td>() ;</td>
<td>Parentheses and other punctuation marks are required elements. Enter them as shown in syntax diagrams.</td>
</tr>
</tbody>
</table>

RELATED DOCUMENTATION

Refer to the following guides for more information:
| **Dharma SDK SQL Reference Manual** | This manual describes syntax and semantics of SQL language statements and elements for the Dharma SDK. |
| **Dharma SDK User Guide** | This manual describes the Dharma Software Development Kit (SDK). It describes implementing JDBC, ODBC and .NET access to proprietary data and considerations for creating a release kit to distribute the completed implementation. |
| **Dharma SDK ISQL Reference Manual** | This manual provides reference material for the ISQL interactive tool provided in the Dharma SDK environment. It also includes a tutorial describing how to use the ISQL utility. |
| **Dharma SDK ODBC Driver Guide** | This manual describes Dharma ODBC SDK support for ODBC (Open Database Connectivity) interface and how to configure the Dharma SDK ODBC Driver. |
| **Dharma SDK JDBC Driver Guide** | Describes Dharma JDBC SDK support for the JDBC interface and how to configure the Dharma SDK JDBC Driver. |
| **Dharma SDK .NET Data Provider Guide** | This guide gives an overview of the .NET Data Provider. It describes how to set up and use the .NET Data Provider to access a Dharma SDK database from .NET applications. |
1.1 OVERVIEW

Interactive SQL (often referred to throughout this manual as ISQL) is a utility supplied with Dharma SDK that lets you issue SQL statements directly from a terminal and see results displayed at the terminal. You can use interactive SQL to:

- Learn how SQL statements work
- Test and prototype SQL statements to be embedded in programs
- Modify an existing database with data definition statements
- Perform ad-hoc queries and generate formatted reports with special ISQL formatting statements

With few exceptions, you can issue any SQL statement in interactive SQL that can be embedded in a program, including CREATE, SELECT, and GRANT statements. Interactive SQL includes an online help facility with syntax and descriptions of the supported statements.

This chapter describes only those statements that are specific to ISQL. See the Dharma SDK SQL Reference Manual for detailed reference information on standard SQL statements that can be issued in other environments.

1.2 STARTING INTERACTIVE SQL

Start ISQL by issuing the isql command at the shell prompt. Dharma SDK invokes ISQL and displays the ISQL prompt:

$ isql sampledb

Dharma/isql Version 09.00.0000

ISQL>

Issue Dharma SDK statements at the ISQL> prompt and terminate them with a semicolon. You can continue statements on multiple lines. ISQL automatically prompts for continuation lines until you terminate the statement with a semicolon.

To execute host operating system commands from the ISQL prompt, type HOST followed by the operating system command. After completion of the HOST statement, the ISQL> prompt returns. To execute SQL scripts from ISQL, type @ followed by the name of the file containing SQL statements.
To exit from interactive SQL, type EXIT or QUIT.

You can supply optional switches and arguments to the isql command.

**Syntax**

```
isql [-s script_file] [-u user_name] [-a password] [connect_string]
```

**Arguments**

- **-s script_file**
The name of an SQL script file that Dharma SDK executes when ISQL is invoked.

  **Note:** If the file name has a space, such as:
  
  test script.sql
  
  The file name must be enclosed in doubles quotes, such as:
  
  isql -s "test script.sql" testdb

- **-u user_name**
The user name Dharma SDK uses to connect to the database specified in the connect_string. Dharma SDK verifies the user name against a corresponding password before it connects to the database. If omitted, the default value depends on the environment. (On UNIX, the value of the DH_USER environment variable specifies the default user name. If DH_USER is not set, the value of the USER environment variable specifies the default user name.)

- **-a password**
The password Dharma SDK uses to connect to the database specified in the connect_string. Dharma SDK verifies the password against a corresponding user name before it connects to the database. If omitted, the default value depends on the environment. (On UNIX, the value of the DH_PASSWD environment variable specifies the default password.)

- **connect_string**
A string that specifies which database to connect to. The connect_string can be a simple database name or a complete connect string. See the CONNECT statement in the Dharma SDK Reference Manual for details on how to specify a complete connect string. If omitted, the default value depends on the environment. (On UNIX, the value of the DB_NAME environment variable specifies the default connect string.)

---

### 1.3 ENVIRONMENT VARIABLES

**DH_DB_OPTIONS=implementer specific connection information**

An additional character string can be passed to the storage system along with the user name, password and database while connecting to the database. This string can be used by the storage system to pass any implementation specific information desired. The string is limited to a length of not more than 200 characters. Specification of the additional connection information is optional.
When a connection is made the server makes a call to the dhcs_rss_init() or StorageEnvironment.createStorageEnvironment() stub function passing the database, user-name and password to the storage system. An additional parameter has been introduced to pass the user defined connection information to the storage system.

## 1.4 STATEMENT HISTORY SUPPORT

ISQL provides statements to simplify the process of executing statements you already typed. ISQL implements a history mechanism similar to the one found in the csh (C-shell) supported by UNIX.

The following table summarizes the ISQL statements that support retrieving, modifying, and rerunning previously entered statements.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>HISTORY</td>
<td>Displays a fixed number of statements (specified by the SET HISTORY statement) which have been entered before this statement, along with a statement number for each statement. Other statements take the statement number as an argument. See section “1.8.12” on page 1-31 for details.</td>
</tr>
<tr>
<td>RUN [ stmt_num ]</td>
<td>Displays and executes the current statement or specified statement in the history buffer. See section “1.8.16” on page 1-35 for details.</td>
</tr>
<tr>
<td>LIST [ stmt_num ]</td>
<td>Displays the current statement or specified statement in the history buffer, and makes that statement the current statement by copying it to the end of the history list. See section “1.8.14” on page 1-34 for details.</td>
</tr>
<tr>
<td>EDIT [ stmt_num ]</td>
<td>Edits the current statement or specified statement in the history buffer, and makes the edited statement the current statement by copying it to the end of the history list. The environment variable EDITOR can be set to the editor of choice. See section “1.8.8” on page 1-28 for details.</td>
</tr>
<tr>
<td>SAVE filename</td>
<td>Saves the current statement in the history buffer to the specified file, which can be then be retrieved through the GET or START statements. See section “1.8.17” on page 1-36 for details.</td>
</tr>
<tr>
<td>GET filename</td>
<td>Fetches the contents of the specified file, from the beginning of the file to the first semicolon, and appends it to the history buffer. The statement fetched by the GET can then be executed by using the RUN statement. See section “1.8.10” on page 1-29 for details.</td>
</tr>
</tbody>
</table>
1.5 FORMATTING OUTPUT OF ISQL QUERIES

Formatting of database query results makes the output of a database query more presentable and understandable. The formatted output of an ISQL database query can be either displayed on the screen, written to a file, or spooled to a printer to produce a hardcopy of the report.

ISQL includes several statements that provide simple formatting of SQL queries. The following table summarizes the ISQL query-formatting statements.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>START filename</td>
<td>Fetches and executes a statement stored in the specified file. Unlike the GET statement, START executes the statement and accepts arguments that it substitutes for parameter references in the statement stored in the file. START also appends the statement to the history buffer. See section &quot;1.8.21&quot; on page 1-42 for details.</td>
</tr>
</tbody>
</table>

Table 1-2: ISQL Statements for Query Formatting

<table>
<thead>
<tr>
<th>Statement</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISPLAY</td>
<td>Displays text, variable values, and/or column values after the specified set of rows (called a break specification). See page 1-25 for details.</td>
</tr>
<tr>
<td>COMPUTE</td>
<td>Performs aggregate-function computations on column values for the specified set of rows, and assigns the results to a variable. DISPLAY statements can then refer to the variable to display its value. See page 1-23 for details.</td>
</tr>
<tr>
<td>BREAK</td>
<td>Specifies at what point ISQL processes associated DISPLAY and COMPUTE statements. BREAK statements can specify that processing occurs after a change in a column's value, after each row, after each page, or at the end of a query. DISPLAY and COMPUTE statements have no effect until you issue a BREAK statement with the same break specification. See page 1-14 for details.</td>
</tr>
<tr>
<td>DEFINE</td>
<td>Defines a variable and assigns a text value to it. When DISPLAY statements refer to the variable, ISQL prints the value. See page 1-25 for details.</td>
</tr>
<tr>
<td>COLUMN</td>
<td>Controls how ISQL displays a column's values (the FORMAT clause) and/or specifies alternative column-heading text (the HEADING clause). See page 1-18 for details.</td>
</tr>
<tr>
<td>TITLE</td>
<td>Specifies text and its positioning that ISQL displays before or after it processes a query. See page 1-46 for details.</td>
</tr>
</tbody>
</table>
The rest of this section provides an extended example that illustrates how to use the statements together to improve formatting.

All the examples use the same ISQL query. The query retrieves data on outstanding customer orders. The query joins two tables, customers and orders. The examples for the TABLE statement on page 1-44 show the columns and data types for these sample tables.

The following example shows the query and an excerpt of the results as ISQL displays them without the benefit of any query-formatting statements:

**Example 1-1: Unformatted Query Display from ISQL**

```
ISQL> select c.customer_name, c.customer_city, o.order_id, o.order_value
from customers c, orders o
where o.customer_id = c.customer_id
order by c.customer_name;
```

<table>
<thead>
<tr>
<th>CUSTOMER_NAME</th>
<th>CUSTOMER_CITY</th>
<th>ORDER_ID</th>
<th>ORDER_VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Enterprises Inc.</td>
<td>Scottsdale</td>
<td>13</td>
<td>3000000</td>
</tr>
<tr>
<td>Aerospace Enterprises Inc.</td>
<td>Scottsdale</td>
<td>14</td>
<td>1500000</td>
</tr>
<tr>
<td>Chemical Construction Inc.</td>
<td>Joplin</td>
<td>11</td>
<td>3000000</td>
</tr>
<tr>
<td>Chemical Construction Inc.</td>
<td>Joplin</td>
<td>12</td>
<td>7500000</td>
</tr>
<tr>
<td>Luxury Cars Inc.</td>
<td>North Ridgeville</td>
<td>21</td>
<td>6000000</td>
</tr>
<tr>
<td>Luxury Cars Inc.</td>
<td>North Ridgeville</td>
<td>20</td>
<td>5000000</td>
</tr>
</tbody>
</table>

**Table 1-2: ISQL Statements for Query Formatting**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLEAR</td>
<td>Removes settings made by the previous DISPLAY, COMPUTE, COLUMN, BREAK, DEFINE, or TITLE statements. See page 1-17 for details.</td>
</tr>
<tr>
<td>SET LINESIZE</td>
<td>Specifies various attributes that affect how ISQL displays queries and results.</td>
</tr>
<tr>
<td>SET PAGESIZE</td>
<td></td>
</tr>
<tr>
<td>SET REPORT</td>
<td></td>
</tr>
<tr>
<td>SET ECHO</td>
<td></td>
</tr>
</tbody>
</table>
Although this query retrieves the correct data, the formatting is inadequate:

- The display for each record wraps across two lines, primarily because of the column definitions for the text columns `customer_name` and `customer_city`. ISQL displays the full column width (50 characters for each column) even though the contents don't use the entire width.
- It's not clear that the values in the `order_value` column represent money amounts.

The next section shows how to use the COLUMN statement to address these formatting issues.

In addition, you can use DISPLAY, COMPUTE, and BREAK statements to present order summaries for each customer. Section 1.3.2 shows how to do this. Finally, you can add text that ISQL displays at the beginning and end of query results with the TITLE statement, as described in Section 1.3.3.

All of these statements are independent of the actual query. You do not need to change the query in any way to control how ISQL formats the results.

### 1.5.1 Formatting Column Display with the COLUMN Statement

You can specify the width of the display for character columns with the COLUMN statement's "An" format string. Specify the format string in the FORMAT clause of the COLUMN statement. You need to issue separate COLUMN statements for each column whose width you want to control in this manner.

The following example shows COLUMN statements that limit the width of the `customer_name` and `customer_city` columns, and re-issues the original query to show how they affect the results.

**Example 1-2: Controlling Display Width of Character Columns**

```
ISQL> COLUMN CUSTOMER_NAME FORMAT "A19"
ISQL> COLUMN CUSTOMER_CITY FORMAT "A19"
ISQL> select c.customer_name, c.customer_city, o.order_id, o.order_value
     from customers c, orders o
     where o.customer_id = c.customer_id
     order by c.customer_name;
```

<table>
<thead>
<tr>
<th>CUSTOMER_NAME</th>
<th>CUSTOMER_CITY</th>
<th>ORDER_ID</th>
<th>ORDER_VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Enterpris</td>
<td>Scottsdale</td>
<td>13</td>
<td>3000000</td>
</tr>
<tr>
<td>Aerospace Enterpris</td>
<td>Scottsdale</td>
<td>14</td>
<td>1500000</td>
</tr>
<tr>
<td>Chemical Constructi</td>
<td>Joplin</td>
<td>11</td>
<td>3000000</td>
</tr>
<tr>
<td>Chemical Constructi</td>
<td>Joplin</td>
<td>12</td>
<td>7500000</td>
</tr>
<tr>
<td>Luxury Cars Inc.</td>
<td>North Ridgeville</td>
<td>21</td>
<td>6000000</td>
</tr>
<tr>
<td>Luxury Cars Inc.</td>
<td>North Ridgeville</td>
<td>20</td>
<td>5000000</td>
</tr>
</tbody>
</table>
Note that ISQL truncates display at the specified width. This means you should specify a value in the FORMAT clause that accommodates the widest column value that the query will display.

To improve the formatting of the order_value column, use the COLUMN statement's numeric format strings. Issue another COLUMN statement, this one for order_value, and specify a format string using the "$", "9", and "," format-string characters:

- The format-string character 9 indicates the width of the largest number. Specify enough 9 format-string characters to accommodate the largest value in the column.
- The format-string character $ directs ISQL to precede column values with a dollar sign.
- The comma (,) format-string character inserts a comma at the specified position in the display.

For the order_value column, the format string "$99,999,999.99" displays values in a format that clearly indicates that the values represent money. (For a complete list of the valid numeric format characters, see “Table 1-3:” on page 1-19.)

The following example shows the complete COLUMN statement that formats the order_value column. As shown by issuing the COLUMN statement without any arguments, this example retains the formatting from the COLUMN statements in the previous example.

**Example 1-3: Customizing Format of Numeric Column Displays**

```sql
ISQL> column order_value format "$99,999,999.99"
ISQL> column; -- Show all the COLUMN statements now in effect:
column CUSTOMER_NAME format "A19" heading "CUSTOMER_NAME"
column CUSTOMER_CITY format "A19" heading "CUSTOMER_CITY"
column ORDER_VALUE format "$99,999,999.99" heading "ORDER_VALUE"
ISQL> select c.customer_name, c.customer_city, o.order_id, o.order_value
    from customers c, orders o
    where o.customer_id = c.customer_id
    order by c.customer_name;
```

<table>
<thead>
<tr>
<th>CUSTOMER_NAME</th>
<th>CUSTOMER_CITY</th>
<th>ORDER_ID</th>
<th>ORDER_VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Enterprise</td>
<td>Scottsdale</td>
<td>13</td>
<td>$3,000,000.00</td>
</tr>
<tr>
<td>Aerospace Enterprise</td>
<td>Scottsdale</td>
<td>14</td>
<td>$1,500,000.00</td>
</tr>
<tr>
<td>Chemical Constructi</td>
<td>Joplin</td>
<td>11</td>
<td>$3,000,000.00</td>
</tr>
<tr>
<td>Chemical Constructi</td>
<td>Joplin</td>
<td>12</td>
<td>$7,500,000.00</td>
</tr>
<tr>
<td>Luxury Cars Inc.</td>
<td>North Ridgeville</td>
<td>21</td>
<td>$6,000,000.00</td>
</tr>
<tr>
<td>Luxury Cars Inc.</td>
<td>North Ridgeville</td>
<td>20</td>
<td>$5,000,000.00</td>
</tr>
</tbody>
</table>
1.5.2 Summarizing Data with the DISPLAY, COMPUTE, and BREAK Statements

Now that the query displays the rows it returns in a more acceptable format, you can use DISPLAY, COMPUTE, and BREAK statements to present order summaries for each customer.

All three statements rely on a break specification to indicate to ISQL when it should perform associated processing. There are four types of breaks you can specify:

- Column breaks are processed whenever the column associated with the break changes in value
- Row breaks are processed after display of each row returned by the query
- Page breaks are processed at the end of each page (as defined by the SET PAGE-SIZE statement)
- Report breaks are processed after display of all the rows returned by the query

While DISPLAY and COMPUTE statements specify what actions ISQL takes for a particular type of break, the BREAK statement itself controls which type of break is currently in effect. A consequence of this behavior is that DISPLAY and COMPUTE statements don't take effect until you issue the BREAK statement with the corresponding break specification.

Also, keep in mind that there can be only one type of break in effect at a time. This means you can format a particular query for a single type of break.

In our example, we are interested in a column break, since we want to display an order summary for each customer. In particular, we want to display the name of the customer along with the number and total value of orders for that customer. And, we want this summary displayed whenever the value in the `customer_name` column changes. In other words, we need to specify a column break on the `customer_name` column.

Approach this task in two steps. First, devise a DISPLAY statement to display the customer name and confirm that it is displaying correctly. Then, issue COMPUTE statements to calculate the statistics for each customer (namely, the count and sum of orders), and add DISPLAY statement to include those statistics. All of the DISPLAY, COMPUTE and BREAK statements have to specify the same break to get the desired results.

The following example shows the DISPLAY and BREAK statements that display the customer name. The COL clause in the DISPLAY statement indents the display slightly to emphasize the change in presentation.

The following example uses the column formatting from previous examples. Notice that the column formatting also affects DISPLAY statements that specify the same column.

**Example 1-4: Specifying Column Breaks and Values with DISPLAY**

```sql
ISQL> display col 5 "Summary of activity for", customer_name on customer_name;
ISQL> break on customer_name
```
ISQL> select c.customer_name, c.customer_city, o.order_id, o.order_value
    from customers c, orders o
    where o.customer_id = c.customer_id
    order by c.customer_name;

<table>
<thead>
<tr>
<th>CUSTOMER_NAME</th>
<th>CUSTOMER_CITY</th>
<th>ORDER_ID</th>
<th>ORDER_VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Enterprise</td>
<td>Scottsdale</td>
<td>13</td>
<td>$3,000,000.00</td>
</tr>
<tr>
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<td>Scottsdale</td>
<td>14</td>
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</tr>
<tr>
<td>Luxury Cars Inc.</td>
<td>North Ridgeville</td>
<td>21</td>
<td>$6,000,000.00</td>
</tr>
<tr>
<td>Luxury Cars Inc.</td>
<td>North Ridgeville</td>
<td>20</td>
<td>$5,000,000.00</td>
</tr>
</tbody>
</table>

Next, issue two COMPUTE statements to calculate the desired summary values.

COMPUTE statements specify an SQL aggregate function (AVG, MIN, MAX, SUM, or COUNT), a column name, a variable name, and a break specification. ISQL applies the aggregate function to all values of the column for the set of rows that corresponds to the break specification. It stores the result in the variable, which subsequent DISPLAY statements can use to display the result.

For this example, you need two separate compute statements. One calculates the number of orders (COUNT OF the order_id column) and the other calculates the total cost of orders (SUM OF the order_value column). Both specify the same break, namely, customer_name. The following example shows the COMPUTE statements, which store the resulting value in the variables num_orders and tot_value.

The following example also issues two more DISPLAY statements to display the variable values. As before, the DISPLAY statements must specify the customer_name break. They also indent their display farther to indicate the relationship with the previously issued DISPLAY.

As before, this example uses the COLUMN and DISPLAY statements from previous examples. ISQL processes DISPLAY statements in the order they were issued. Use the DISPLAY statement, without any arguments, to show the current set of DISPLAY statements in effect. Also, in the query results, notice that the column formatting specified for the order_value column carries over to the tot_value variable, which is based on order_value.

Example 1-5: Calculating Statistics on Column Breaks with COMPUTE

ISQL> compute count of order_id in num_orders on customer_name
ISQL> compute sum of order_value in tot_value on customer_name
ISQL> display col 10 "Total number of orders: ", num_orders on customer_name;
ISQL> display col 10 "Total value of orders:" , tot_value on customer_name;
ISQL> display -- See all the DISPLAY statements currently active:
display col 5 "Summary of activity for" , customer_name on customer_name
display col 10 "Total number of orders:" , num_orders on customer_name
display col 10 "Total value of orders:" , tot_value on customer_name
ISQL> select c.customer_name, c.customer_city, o.order_id, o.order_value
     from customers c, orders o
     where o.customer_id = c.customer_id
     order by c.customer_name;

<table>
<thead>
<tr>
<th>CUSTOMER_NAME</th>
<th>CUSTOMER_CITY</th>
<th>ORDER_ID</th>
<th>ORDER_VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Enterpris</td>
<td>Scottsdale</td>
<td>13</td>
<td>$3,000,000.00</td>
</tr>
<tr>
<td>Aerospace Enterpris</td>
<td>Scottsdale</td>
<td>14</td>
<td>$1,500,000.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Constructi</td>
<td>Joplin</td>
<td>11</td>
<td>$3,000,000.00</td>
</tr>
<tr>
<td>Chemical Constructi</td>
<td>Joplin</td>
<td>12</td>
<td>$7,500,000.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Luxury Cars Inc.</td>
<td>North Ridgeville</td>
<td>21</td>
<td>$6,000,000.00</td>
</tr>
<tr>
<td>Luxury Cars Inc.</td>
<td>North Ridgeville</td>
<td>20</td>
<td>$5,000,000.00</td>
</tr>
</tbody>
</table>

Summary of activity for Aerospace Enterpris
Total number of orders: 2
Total value of orders: $4,500,000.00

Summary of activity for Chemical Constructi
Total number of orders: 2
Total value of orders: $10,500,000.00

Summary of activity for Luxury Cars Inc.
Total number of orders: 2
Total value of orders: $11,000,000.00

1.5.3 Adding Beginning and Concluding Titles with the TITLE Statement

You can add some finishing touches to the query display with the TITLE statement.

The TITLE statement lets you specify text that ISQL displays before (TITLE TOP) or after (TITLE BOTTOM) the query results.

The title can also be horizontally positioned by specifying the keywords LEFT, CENTER, or RIGHT; or by specifying the actual column number corresponding to the required positioning of the title. Use the SKIP clause to skip lines after a top title or before a bottom title.

The following example uses two TITLE statements to display a query header and footer.
Example 1-6: Specifying a Query Header and Footer with TITLE

ISQL> TITLE TOP LEFT "Orders Summary" RIGHT "September 29, 1998" SKIP 2;
ISQL> SHOW LINESIZE -- RIGHT alignment of TITLE is relative to this value:
LINESIZE .................... : 78
ISQL> TITLE BOTTOM CENTER "End of Orders Summary Report" SKIP 2;
ISQL> select c.customer_name, c.customer_city, o.order_id, o.order_value
      from customers c, orders o
      where o.customer_id = c.customer_id
      order by c.customer_name;

Orders Summary September 29, 1998

<table>
<thead>
<tr>
<th>CUSTOMER_NAME</th>
<th>CUSTOMER_CITY</th>
<th>ORDER_ID</th>
<th>ORDER_VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Enterprise</td>
<td>Scottsdale</td>
<td>13</td>
<td>$3,000,000.00</td>
</tr>
<tr>
<td>Aerospace Enterprise</td>
<td>Scottsdale</td>
<td>14</td>
<td>$1,500,000.00</td>
</tr>
</tbody>
</table>

Summary of activity for Aerospace Enterprise
Total number of orders: 2
Total value of orders: $4,500,000.00

<table>
<thead>
<tr>
<th>CUSTOMER_NAME</th>
<th>CUSTOMER_CITY</th>
<th>ORDER_ID</th>
<th>ORDER_VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Construction</td>
<td>Joplin</td>
<td>11</td>
<td>$3,000,000.00</td>
</tr>
<tr>
<td>Chemical Construction</td>
<td>Joplin</td>
<td>12</td>
<td>$7,500,000.00</td>
</tr>
</tbody>
</table>

Summary of activity for Chemical Construction
Total number of orders: 2
Total value of orders: $10,500,000.00

<table>
<thead>
<tr>
<th>CUSTOMER_NAME</th>
<th>CUSTOMER_CITY</th>
<th>ORDER_ID</th>
<th>ORDER_VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luxury Cars Inc.</td>
<td>North Ridgeville</td>
<td>21</td>
<td>$6,000,000.00</td>
</tr>
<tr>
<td>Luxury Cars Inc.</td>
<td>North Ridgeville</td>
<td>20</td>
<td>$5,000,000.00</td>
</tr>
</tbody>
</table>

Summary of activity for Luxury Cars Inc.
Total number of orders: 2
Total value of orders: $11,000,000.00

<table>
<thead>
<tr>
<th>CUSTOMER_NAME</th>
<th>CUSTOMER_CITY</th>
<th>ORDER_ID</th>
<th>ORDER_VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tower Construction</td>
<td>Munising</td>
<td>8</td>
<td>$2,000,000.00</td>
</tr>
<tr>
<td>Tower Construction</td>
<td>Munising</td>
<td>10</td>
<td>$6,000,000.00</td>
</tr>
<tr>
<td>Tower Construction</td>
<td>Munising</td>
<td>9</td>
<td>$8,000,000.00</td>
</tr>
</tbody>
</table>

Summary of activity for Tower Construction
Total number of orders: 3
Total value of orders: $16,000,000.00

End of Orders Summary Report
23 records selected
ISQL>
1.6 THE HELP AND TABLE STATEMENTS

ISQL supports an on-line help facility that can be invoked by using the HELP statement. Typing HELP at the ISQL prompt will display a help file which will list the options accepted by the HELP statement. The various forms of the HELP statement are listed below:

- HELP — Displays the options that can be specified for HELP.
- HELP COMMANDS — Displays all the statements that ISQL accepts.
- HELP command_name — Displays help file corresponding to the specified statement.

TABLE is an ISQL statement that displays all the tables present in the database including any system tables. TABLE can be used also to display the description of a single table by explicitly giving the table name. Both forms of the TABLE statement are shown below:

```
TABLE;
TABLE table_name;
```

1.7 TRANSACTION SUPPORT

A transaction is started with the execution of the first SQL statement. A transaction is committed using the COMMIT WORK statement and rolled back using the ROLLBACK WORK statement.

If the AUTOCOMMIT option is set to ON, then ISQL treats each SQL statement as a single transaction. This prevents the user from holding locks on the database for an extended period of time. This is very critical when the user is querying an on-line database in which a transaction processing application is executing in real time.

A set of SQL statements can be executed as part of a transaction and committed using the COMMIT WORK statement. This is shown below:

```
<SQL statement>

<SQL statement>

<SQL statement>

COMMIT WORK ;
```

Instead, a transaction can also be rolled back using the ROLLBACK WORK statement as shown:

```
<SQL statement>

<SQL statement>

<SQL statement>
```
ROLLBACK WORK;
An SQL statement starting immediately after a COMMIT WORK or ROLLBACK WORK statement starts a new transaction.

1.8 ISQL REFERENCE

This section provides reference material for statements specific to ISQL.

This section does not include descriptions of standard SQL statements or statements specific to embedded SQL. For details on the syntax and semantics of those other SQL statements, see the Dharma SDK Reference Manual.

1.8.1 @ (Execute)

Syntax

@filename

Description

Executes the SQL statements stored in the specified SQL script file. The statements specified in the file are not added to the history buffer.

Arguments

filename

The name of the script file.

Notes

The GET, START, and @ (execute) statements are similar in that they all read SQL script files. Both GET and START read an SQL script file and append the first statement in it to the history buffer. However, the START statement also executes the script statement and accepts arguments that it substitutes for parameter references in the script statement. The @ (execute) statement, on the other hand, executes all the statements in an SQL script file but does not add any of the statements to the history buffer. The @ statement does not support argument substitution.

Example

The following example shows a simple ISQL script file.

Example 1-7: Sample ISQL script

connect to demodb;
set echo on;
create table stores (item_no integer, item_name char(20));
insert into stores values (1001,chassis);
insert into stores values (1002,chips);
select * from stores where item_no > 1001;
set echo off;

To execute the above statements stored in a file named cmdfile, enter:
1.8.2 BREAK

Syntax

\[
\text{BREAK [ ON break \_spec [ SKIP n ] ] ;}
\]

break \_spec::

{ column \_name [ , \ldots ] | ROW | PAGE | REPORT }

Description

The BREAK statement specifies at what point ISQL processes associated DISPLAY and COMPUTE statements. DISPLAY and COMPUTE statements have no effect until you issue a BREAK statement with the same break specification.

A break can be specified on any of the following events:

- Change in the value of a column
- Selection of each row
- End of a page
- End of a report

Only one BREAK statement can be in effect at a time. When a new BREAK statement is entered, it replaces the previous BREAK statement. The BREAK statement can specify one or more columns on which the break can occur.

The BREAK statement without any clauses displays the currently-set break, if any.

Arguments

break \_spec

The events that cause an SQL query to be interrupted and the execution of the associated COMPUTE and DISPLAY statements. break \_spec can be any of the following values:

- column \_name: Causes a break when the value of the column specified by column \_name changes.
- ROW: Causes a break on every row selected by a SELECT statement.
- PAGE: Causes a break at the end of each page. The end of a page is specified in the SET PAGESIZE statement. See section “1.8.18” on page 1-37 for details on the SET statement.
- REPORT: Causes a break at the end of a report or query.
- SKIP n: The optional SKIP clause can be used to skip the specified number of lines when the specified break occurs and before processing of any associated DISPLAY statements.
Examples

The following examples illustrate how various break settings and corresponding DISPLAY statements affect the display of the same query.

```sql
ISQL> break
no break specified
ISQL> select customer_name from customers;  -- Default display
CUSTOMER_NAME
-------------
Sports Cars Inc.
Mighty Bulldozer Inc.
Ship Shapers Inc.
Tower Construction Inc.
Chemical Construction Inc.
Aerospace Enterprises Inc.
Medical Enterprises Inc.
Rail Builders Inc.
Luxury Cars Inc.
Office Furniture Inc.
10 records selected
ISQL> -- Set DISPLAY values for different breaks:
ISQL> display "Break on change in value of customer_name!" on customer_name;
ISQL> display "Break on every row!" on row;
ISQL> display "Break on page (page size set to 2 lines)" on page;
ISQL> display "Break on end of report!" on report;
ISQL> set pagesize 2
ISQL> break on customer_name
ISQL> select customer_name from customers;
CUSTOMER_NAME
-------------
Sports Cars Inc.
Break on change in value of customer_name!
Mighty Bulldozer Inc.
Break on change in value of customer_name!
Ship Shapers Inc.
Break on change in value of customer_name!
.
.
ISQL> break on row
```
ISQL> select customer_name from customers;
CUSTOMER_NAME
-------------
Sports Cars Inc.
Break on every row!
Mighty Bulldozer Inc.
Break on every row!
Ship Shapers Inc.
Break on every row!
.
.
ISQL> break on page
ISQL> select customer_name from customers;
CUSTOMER_NAME
-------------
Break on page (page size set to 2 lines)
CUSTOMER_NAME
-------------
Sports Cars Inc.
Break on page (page size set to 2 lines)
CUSTOMER_NAME
-------------
Mighty Bulldozer Inc.
Break on page (page size set to 2 lines)
.
.
ISQL> break on report
ISQL> select customer_name from customers;
CUSTOMER_NAME
-------------
Sports Cars Inc.
Mighty Bulldozer Inc.
Ship Shapers Inc.
Tower Construction Inc.
Chemical Construction Inc.
Aerospace Enterprises Inc.
Medical Enterprises Inc.
Rail Builders Inc.
Introduction

Luxury Cars Inc.
Office Furniture Inc.
Break on end of report!
10 records selected
ISQL>

1.8.3 CLEAR

Syntax

CLEAR option ;
option:::
    HISTORY
    | BREAK
    | COLUMN
    | COMPUTE
    | DISPLAY
    | TITLE

Description

The CLEAR statement removes settings made by the ISQL statement corresponding to option.

Argument

option
Which ISQL statement's settings to clear:

• CLEAR HISTORY — Clears the ISQL statement history buffer.
• CLEAR BREAK — Clears the break set by the BREAK statement.
• CLEAR COLUMN — Clears formatting options set by any COLUMN statements in effect.
• CLEAR COMPUTE — Deletes clears all the options set by the COMPUTE statement.
• CLEAR DISPLAY — Clears the displays set by the DISPLAY statement.
• CLEAR TITLE— Clears the titles set by the TITLE statement.

Examples

The following example illustrates clearing the DISPLAY and BREAK settings.

ISQL> DISPLAY -- See the DISPLAY settings currently in effect:
display "Break on change in value of customeer_name!" on customer_name
display "Break on every row!" on row
display "Break on page (page size set to 2 lines)" on page
display "Break on end of report!" on report
ISQL> CLEAR DISPLAY
ISQL> DISPLAY
No display specified.
ISQL> BREAK
break on report skip 0
ISQL> CLEAR BREAK
ISQL> BREAK
no break specified
ISQL>

1.8.4 COLUMN

Syntax

COLUMN [ column_name
  [ FORMAT " format_string " ] | [ HEADING " heading_text " ] ] ;

Description

The COLUMN statement controls how ISQL displays a column's values (the FORMAT clause) and specifies alternative column-heading text (the HEADING clause).

The COLUMN statement without any arguments displays the current column specifications.

Arguments

column_name
The name of the column affected by the COLUMN statement. If the COLUMN statement includes column_name but omits both the FORMAT and HEADING clauses, ISQL clears any formatting and headings in effect for that column. The formatting specified for column_name also applies to DISPLAY statements that specify the same column.

FORMAT " format_string "
Specifies a quoted string that formats the display of column values. Valid values for format strings depend on the data type of the column.

Character
The only valid format string for character data types is of the form "An", where n specifies the width of the column display. The A character must be upper case.

Numeric
"Table 1-3:" on page 1-19 shows valid format strings for numeric data types.
**Date-time**  
“Table 1-4:” on page 1-19 shows valid format strings for date-time data types. The format strings consist of keywords that SQL interprets and replaces with formatted values. Any other character in the format string are displayed as literals. The format strings are case sensitive. For instance, SQL replaces ‘DAY’ with all uppercase letters, but follows the case of ‘Day’. Note that the SQL scalar function TO_CHAR offers comparable functionality and is not limited to SQL statements issued within ISQL. See the *Dharma SDK Reference Manual* for details on TO_CHAR.

COLUMN format strings also affect display values in DISPLAY statements that specify the same column or a COMPUTE value based on the column.

**HEADING " heading_text "**  
Specifies an alternative heading for the column display. The default is the column name.

**Format String Details**

**Table 1-3: Numeric Format Strings for the COLUMN Statement**

<table>
<thead>
<tr>
<th>Character</th>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>99999</td>
<td>Number of 9’s specifies width. If the column value is too large to display in the specified format, ISQL displays # characters in place of the value.</td>
</tr>
<tr>
<td>0</td>
<td>09999</td>
<td>Display leading zeroes.</td>
</tr>
<tr>
<td>$</td>
<td>$99999</td>
<td>Prefix the display with '$'.</td>
</tr>
<tr>
<td>Б</td>
<td>Б9999</td>
<td>Display blanks if the value is zero.</td>
</tr>
<tr>
<td>.</td>
<td>99,999</td>
<td>Display a comma at position specified by the comma.</td>
</tr>
<tr>
<td>.</td>
<td>99,999,99</td>
<td>Display a decimal point at the specified position.</td>
</tr>
<tr>
<td>MI</td>
<td>99999MI</td>
<td>Display ‘-’ after a negative value.</td>
</tr>
<tr>
<td>PR</td>
<td>99999PR</td>
<td>Display negative values between ‘&lt;’ and ‘&gt;’.</td>
</tr>
</tbody>
</table>

**Table 1-4: Date-Time Format Strings for the Column Statement**

<table>
<thead>
<tr>
<th>Character</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td>The century as a 2-digit number.</td>
</tr>
<tr>
<td>YYYY</td>
<td>The year as a 4-digit number.</td>
</tr>
<tr>
<td>YYY</td>
<td>The last 3 digits of the year.</td>
</tr>
<tr>
<td>YY</td>
<td>The last 2 digits of the year.</td>
</tr>
<tr>
<td>Y</td>
<td>The last digit of the year.</td>
</tr>
</tbody>
</table>
### Table 1-4: Date-Time Format Strings for the Column Statement

<table>
<thead>
<tr>
<th>Character</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td>The century as a 2-digit number.</td>
</tr>
<tr>
<td>YYYY</td>
<td>The year as a 4-digit number with a comma after the first digit.</td>
</tr>
<tr>
<td>Q</td>
<td>The quarter of the year as 1-digit number (with values 1, 2, 3, or 4).</td>
</tr>
<tr>
<td>MM</td>
<td>The month value as 2-digit number (in the range 01-12).</td>
</tr>
<tr>
<td>MONTH</td>
<td>The name of the month as a string of 9 characters (‘JANUARY’ to ‘DECEMBER’).</td>
</tr>
<tr>
<td>MON</td>
<td>The first 3 characters of the name of the month (in the range ‘JAN’ to ‘DEC’).</td>
</tr>
<tr>
<td>WW</td>
<td>The week of year as a 2-digit number (in the range 01-52).</td>
</tr>
<tr>
<td>W</td>
<td>The week of month as a 1-digit number (in the range 1-5).</td>
</tr>
<tr>
<td>DDD</td>
<td>The day of year as a 3-digit number (in the range 001-365).</td>
</tr>
<tr>
<td>DD</td>
<td>The day of month as a 2-digit number (in the range 01-31).</td>
</tr>
<tr>
<td>D</td>
<td>The day of week as a 1-digit number (in the range 1-7, 1 for Sunday and 7 for Saturday).</td>
</tr>
<tr>
<td>DAY</td>
<td>The day of week as a 9 character string (in the range ‘SUNDAY’ to ‘SATURDAY’).</td>
</tr>
<tr>
<td>DY</td>
<td>The day of week as a 3 character string (in the range ‘SUN’ to ‘SAT’).</td>
</tr>
<tr>
<td>J</td>
<td>The Julian day (number of days since DEC 31, 1899) as an 8 digit number.</td>
</tr>
<tr>
<td>TH</td>
<td>When added to a format keyword that results in a number, this format keyword (&quot;TH&quot;) is replaced by the string ‘ST’, ‘ND’, ‘RD’ or ‘TH’ depending on the last digit of the number.</td>
</tr>
<tr>
<td>AMPM</td>
<td>The string ‘AM’ or ‘PM’ depending on whether time corresponds to forenoon or afternoon.</td>
</tr>
<tr>
<td>A.M.P.M.</td>
<td>The string ‘A.M.’ or ‘P.M.’ depending on whether time corresponds to forenoon or afternoon.</td>
</tr>
<tr>
<td>HH12</td>
<td>The hour value as a 2-digit number (in the range 00 to 11).</td>
</tr>
<tr>
<td>HHHH24</td>
<td>The hour value as a 2-digit number (in the range 00 to 23).</td>
</tr>
<tr>
<td>MI</td>
<td>The minute value as a 2-digit number (in the range 00 to 59).</td>
</tr>
</tbody>
</table>
Table 1-4: Date-Time Format Strings for the Column Statement

<table>
<thead>
<tr>
<th>Character</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td>The century as a 2-digit number.</td>
</tr>
<tr>
<td>SS</td>
<td>The seconds value as a 2-digit number (in the range 00 to 59).</td>
</tr>
<tr>
<td>SSSSS</td>
<td>The seconds from midnight as a 5-digit number (in the range 00000 to 86399).</td>
</tr>
<tr>
<td>MLS</td>
<td>The milliseconds value as a 3-digit number (in the range 000 to 999).</td>
</tr>
</tbody>
</table>

Examples

The following examples are based on a table, orders, with columns defined as follows:

```
ISQL> table orders
COLNAME                  NULL ?   TYPE   LENGTH
-------                  ------   ----    ------
order_id                 NOT NULL INT     4
customer_id              INT       4
steel_type               CHAR      20
order_info               CHAR      200
order_weight             INT       4
order_value              INT       4
order_state              CHAR      20

ISQL displays the order_info column, at 200 characters, with lots of blank space preceding the values:

ISQL> select order_info from orders where order_value < 1000000
ORDER_INFO
----------
Solid Rods 5 in. diameter

1 record selected
```

You can improve formatting by using the character format string to limit the width of the display:

```
ISQL> column ORDER_INFO format "A28" heading "Details"
```
ISQL> select order_info from orders where order_value < 1000000;
ORDER_INFO
----------
Solid Rods 5 in. diameter
1 record selected
ISQL> -- Illustrate some options with numeric format strings.
ISQL> -- No column formatting:
ISQL> select order_value from orders where order_value < 1000000;

ORDER_VALUE
-----------
110000
1 record selected
ISQL> -- Format to display as money, and use different heading:
ISQL> column order_value format "$999,999,999.99" heading "Amount"
ISQL> select order_value from orders where order_value < 1000000;

AMOUNT
------
$110,000.00
1 record selected

The following examples use the single-value system table, syscalctable, and the sysdate scalar function, to illustrate some date-time formatting. The sysdate function returns today's date.

ISQL> select sysdate from syscalctable;  -- No formatting
SYSDATE
-------
05/07/1998
ISQL> column sysdate format "Day"
ISQL> select sysdate from syscalctable
SYSDATE
-------
Thursday
1 record selected
ISQL> column sysdate format "Month"
ISQL> select sysdate from syscalctable
SYSDATE
-------
May
1 record selected
ISQL> column sysdate format "DDth"
ISQL> select sysdate from syscalctable
SYSDATE
-------
7th
1 record selected

Note: If the select-list of a query includes column titles, they override formatting specified in COLUMN statements for those columns. The following example illustrates this behavior.

ISQL> select fld from syscalctable; -- No formatting
FLD
---
100
1 record selected
ISQL> column fld heading "column title" -- Specify heading in COLUMN statement
ISQL> select fld from syscalctable;
COLUMN TITLE
-----------
100
1 record selected
ISQL> select fld "new title" from syscalctable; -- Specify title in select list
NEW TITLE
--------
100
1 record selected

1.8.5 COMPUTE

Syntax

COMPUTE

[ ( AVG | MAX | MIN | SUM | COUNT ) ]
OF column_name
IN variable_name
ON break_spec ] ;

break_spec:::
{ column_name | ROW | PAGE | REPORT }

Description

Performs aggregate function computations on column values for the specified set of rows, and assigns the results to a variable. DISPLAY statements can then refer to the variable to display its value.
COMPUTE statements have no effect until you issue a BREAK statement with the same break_spec.

Issuing the COMPUTE statement without any arguments displays the currently-set COMPUTE specifications, if any.

Arguments

**AVG | MAX | MIN | SUM | COUNT**

The function to apply to values of column_name. The functions AVG, MAX, MIN, and SUM can be used only when the column is numeric. The function COUNT can be used for any column type.

**column_name**

The column whose value is to be computed. The column specified in column_name must also be included in the select list of the query. If column_name is not also included in the select list, it has no effect.

**variable_name**

Specifies the name of the variable where the computed value is stored. ISQL issues an implicit DEFINE statement for variable_name and assigns the variable a value of zero. During query processing, the value of variable_name changes as ISQL encounters the specified breaks.

**break_spec**

Specifies the set of rows after which ISQL processes the COMPUTE statement. A COMPUTE statement has no effect until you issue a corresponding BREAK statement. See the description of the BREAK statement on page 1-14 for details.

Examples

The following example computes the number of items ordered by each customer.

```
ISQL> break on customer_name
ISQL> display col 5 "Number of orders placed by", customer_name, ", ", n_ord on customer_name
ISQL> compute count of order_id in n_ord on customer_name;
ISQL> select c.customer_name, o.order_id from customers c, orders o
     where o.customer_id = c.customer_id;
```

<table>
<thead>
<tr>
<th>CUSTOMER_NAME</th>
<th>ORDER_ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports Cars Inc.</td>
<td>1</td>
</tr>
<tr>
<td>Sports Cars Inc.</td>
<td>2</td>
</tr>
<tr>
<td>Number of orders placed by Sports Cars Inc. = 2</td>
<td></td>
</tr>
<tr>
<td>Mighty Bulldozer Inc.</td>
<td>3</td>
</tr>
<tr>
<td>Mighty Bulldozer Inc.</td>
<td>4</td>
</tr>
<tr>
<td>Number of orders placed by Mighty Bulldozer Inc.</td>
<td></td>
</tr>
</tbody>
</table>
1.8.6 DEFINE

Syntax

```
DEFINE [ variable_name = value ] ;
```

Description

The DEFINE statement defines a variable and assigns an ASCII string value to it. When you refer to the defined variable in DISPLAY statements, ISQL prints the value.

The DEFINE statement is useful if you have scripts with many DISPLAY statements. You can change a single DEFINE statement to change the value in all of the DISPLAY statements that refer to the variable.

Issuing the DEFINE statement without any arguments displays any currently-defined variables, including those defined through the COMPUTE statement.

Arguments

- `variable_name`
  Specifies the name by which the variable can be referred to.

- `value`
  The ASCII string that is assigned to the variable. Enclose value in quotes if it contains any non-numeric values.

Example

The following example defines a variable called `nestate` and assigns the value NH to it.

```
ISQL> DEFINE nestate = "NH";
```

1.8.7 DISPLAY

Syntax

```
DISPLAY { [ col_position ] display_value } [ , ... ] ON break_spec ;
```

col_position::

- `{ COL column_number | @ column_name }

display_value::

- `{ "text string" | variable | column_name }

break_spec::

- `{ column_name | ROW | PAGE | REPORT }
Description

The DISPLAY statement displays the specified text, variable value, and/or column value after the set of rows specified by break_spec. DISPLAY statements have no effect until you issue a BREAK statement with the same break_spec.

Issuing the DISPLAY statement without any arguments displays the currently-set DISPLAY specifications, if any.

Arguments

**col_position**
An optional argument that specifies the horizontal positioning of the associated display value. There are two forms for the argument:

- **COL column_number** Directly specifies the column position of the display value as an integer (1 specifies column 1, 2 specifies column 2, and so on.).
- **@column_name** Names a column in the select list of the SQL query. ISQL aligns the display value with the specified column.

If the DISPLAY statement omits col_position, ISQL positions the display value at column 1.

**display_value**
The value to display when the associated break occurs:

- **"text string"** If the display value is a text string, ISQL simply displays the text string.
- **variable** If the display value is a variable, ISQL displays the value of the variable when the associated break occurs. The variable argument refers to a variable named in a COMPUTE or DEFINE statement that executes before the query. If variable is undefined, ISQL ignores it.
- **column_name** If the display value is a column name, ISQL displays the value of the column when the associated break occurs. The column specified in column_name must also be included in the select list of the query. If column_name is not also included in the select list, it has no effect. If a COLUMN statement specifies a format for the same column, the formatting also affects the DISPLAY statement.

**break_spec**
Specifies the set of rows after which ISQL processes the DISPLAY statement. A DISPLAY statement has no effect until you issue a corresponding BREAK statement. See the description of the BREAK statement on page 1-14 for details of break specifications.
Examples

The following set of examples compute the number of orders placed by each customer and displays the message Number of orders placed by, followed by the customer name and the count of orders.

```
ISQL> break on customer_name
ISQL> display col 5 "Number of orders placed by", customer_name, ", n_ord on customer_name
ISQL> compute count of order_id in n_ord on customer_name;
ISQL> select c.customer_name, o.order_id from customers c, orders o
where o.customer_id = c.customer_id;
```

<table>
<thead>
<tr>
<th>CUSTOMER_NAME</th>
<th>ORDER_ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports Cars Inc.</td>
<td>1</td>
</tr>
<tr>
<td>Sports Cars Inc.</td>
<td>2</td>
</tr>
<tr>
<td>Sports Cars Inc.</td>
<td></td>
</tr>
<tr>
<td>Number of orders placed by Sports Cars Inc.</td>
<td>2</td>
</tr>
<tr>
<td>Mighty Bulldozer Inc.</td>
<td>3</td>
</tr>
<tr>
<td>Mighty Bulldozer Inc.</td>
<td>4</td>
</tr>
<tr>
<td>Number of orders placed by Mighty Bulldozer Inc.</td>
<td>2</td>
</tr>
<tr>
<td>Ship Shapers Inc.</td>
<td>5</td>
</tr>
<tr>
<td>Ship Shapers Inc.</td>
<td>6</td>
</tr>
<tr>
<td>Ship Shapers Inc.</td>
<td>7</td>
</tr>
<tr>
<td>Number of orders placed by Ship Shapers Inc.</td>
<td>3</td>
</tr>
<tr>
<td>Tower Construction Inc.</td>
<td>8</td>
</tr>
<tr>
<td>Tower Construction Inc.</td>
<td>9</td>
</tr>
<tr>
<td>Tower Construction Inc.</td>
<td>10</td>
</tr>
<tr>
<td>Number of orders placed by Tower Construction Inc.</td>
<td>3</td>
</tr>
</tbody>
</table>

If the select-list of a query includes column titles, they override DISPLAY statements that include variable or column_name display values for those columns:

```
ISQL> display col 5 "test display. Sum of fld is", tmp on fld;
ISQL> compute sum of fld in tmp on fld;
ISQL> break on fld
ISQL> select fld from syscalctable;  -- This works:
```

```
<table>
<thead>
<tr>
<th>FLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
</tr>
<tr>
<td>100</td>
</tr>
</tbody>
</table>
```

```
test display. Sum of fld is 100
```
1 record selected
ISQL> select fld "column title" from syscalctable;  -- DISPLAY
is disabled:
COLUMN TITLE
----------
  100
1 record selected

1.8.8   EDIT

Syntax

E[DIT] [stmt_num];

Description

The EDIT statement invokes a text editor to edit the specified statement from the
statement history buffer. If the statement number is not specified, the last statement in
the history buffer is edited. When you exit the editor, ISQL writes the buffer contents
as the last statement in the history buffer.

By default, ISQL invokes the vi editor on UNIX and the MS-DOS editor on NT. You
can change the default by setting the EDITOR environment variable:

- On UNIX, set the environment variable at the operating system command level:
  
  setenv EDITOR /usr/local/bin/gmacs

- On NT, set the environment variable in the initialization file DHSQL.INI in the
  windows directory:
  
  EDITOR = c:\msoffice\winword.exe

Examples

The following example uses the ! (shell) command to show the currently-set value of
the EDITOR environment variable in the UNIX environment (it shows that it is set to
invoke the GNU emacs editor). Then, the example uses the EDIT command to read in
the fifth statement in the history buffer into an editing buffer.

ISQL> ! printenv EDITOR
/usr/local/bin/gmacs
ISQL> EDIT 5;

The following example edits the last statement in the history
buffer:
ISQL> select * from systable;  -- bad table name!
  *
error(-20005): Table/View/Synonym not found
ISQL> EDIT  -- invoke an editor to correct the error
.
. 
ISQL> list -- corrected statement is now the current statement:
select * from systables
ISQL> run -- run the corrected statement
.
.
1.8.9 EXIT or QUIT

Syntax
EXIT

Description
The EXIT statement terminates the ISQL session.

Related Statements
QUIT and EXIT are synonymous. There is no difference in their effect.

1.8.10 GET

Syntax
GET filename;

Description
The GET statement reads the first SQL statement stored in the specified script file.

Arguments
filename
The name of the script file. ISQL reads the file until it encounters a semicolon (;) statement terminator. It appends the statement to the history buffer as the most-recent statement.

Notes
- Execute the statement read by GET using the RUN statement.
- The GET, START, and @ (execute) statements are similar in that they all read SQL script files. Both GET and START read an SQL script file and append the first statement in it to the history buffer. However, the START statement also executes the script statement and accepts arguments that it substitutes for parameter references in the script statement. The @ (execute) statement, on the other hand, executes all the statements in an SQL script file but does not add any of the statements to the history buffer. The @ statement does not support argument substitution.
Example

Once you refine a query to return the results you need, you can store it in an SQL script file. For example, the file query.sql contains a complex query that joins several tables in a sample database.

Use the GET and RUN statements to read and execute the first statement in query.sql:

```sql
ISQL> GET query.sql
SELECT customers.customer_name,
       orders.order_info,
       orders.order_state,
       lot_staging.lot_location,
       lot_staging.start_date
FROM customers,
     orders,
     lots,
     lot_staging
WHERE ( customers.customer_id = orders.customer_id ) and
   ( lots.lot_id = lot_staging.lot_id ) and
   ( orders.order_id = lots.order_id ) and
   ( customers.customer_name = 'Ship Shapers Inc.' ) AND
   ( lot_staging.start_date is not NULL ) AND
   ( lot_staging.end_date is NULL )

ISQL> RUN
SELECT customers.customer_name,
       orders.order_info,
       orders.order_state,
       lot_staging.lot_location,
       lot_staging.start_date
FROM customers,
     orders,
     lots,
     lot_staging
WHERE ( customers.customer_id = orders.customer_id ) and
   ( lots.lot_id = lot_staging.lot_id ) and
   ( orders.order_id = lots.order_id ) and
   ( customers.customer_name = 'Ship Shapers Inc.' ) AND
   ( lot_staging.start_date is not NULL ) AND
   ( lot_staging.end_date is NULL )

CUSTOMER_NAME                  ORDER_INFO
--------------------------------------------------
Ship Shapers Inc.              I Beams Size 10

ORDER_STATE       LOT_LOCATION     START_DATE
------------------------------------------------
Processing        Hot Rolling      12/26/1994
```
1.8.11 HELP

Syntax

HELP {COMMANDS | CLAUSES};

HELP ;

Description

The HELP statement displays the help information for the specified statement or clause.

Notes

- HELP COMMANDS displays a list of statements for which help text is available.
- HELP CLAUSES display a list of clauses for which help text is available.
- HELP statement with no clauses display the help text for the HELP statement.

Example

The following HELP statement will give a brief description of the SELECT statement.

ISQL> HELP SELECT;

1.8.12 HISTORY

Syntax

HISTORY;

Description

The HISTORY statement lists the statements in the statement history buffer, along with an identifying number.

Notes

- ISQL maintains a list of statements typed by the user in the statement history buffer. The SET HISTORY statement sets the size of the history buffer.
- The statements LIST, EDIT, HISTORY, and RUN are not added to the history buffer.
- Use HISTORY to obtain the statement number for a particular statement in the history buffer that you want to execute. Then, use the RUN statement with the statement number as an argument to execute that statement. Or, use LIST statement with the statement number as an argument to make the statement the current statement, which can then be executed using RUN without an argument.
Example

The following example illustrates usage of the HISTORY statement.

```
ISQL> HISTORY -- Display statements in the history buffer
  1   start start_ex.sql Ship
  2   SELECT customer_name FROM customers
       WHERE customer_name LIKE 'Ship%'
  3   select tbl from systables where tbltype = 'T'
ISQL> RUN 2 -- Run the query corresponding to statement 2
SELECT customer_name FROM customers
WHERE customer_name LIKE 'Ship%

CUSTOMER_NAME
-------------
Ship Shapers Inc.
1 record selected
ISQL> HI -- In addition to executing, statement 2 is now the current statement
  1   start start_ex.sql Ship
  2   SELECT customer_name FROM customers
       WHERE customer_name LIKE 'Ship%'
  3   select tbl from systables where tbltype = 'T'
  4   SELECT customer_name FROM customers
       WHERE customer_name LIKE 'Ship%'
ISQL> LIST 3 -- Display statement 3 and copy it to the end of the history list
select tbl from systables where tbltype = 'T'
ISQL> history -- Statement 3 is now also the current statement
  1   start start_ex.sql Ship
  2   SELECT customer_name FROM customers
       WHERE customer_name LIKE 'Ship%'
  3   select tbl from systables where tbltype = 'T'
  4   SELECT customer_name FROM customers
       WHERE customer_name LIKE 'Ship%'
  5   select tbl from systables where tbltype = 'T'
```

1.8.13 HOST or SH or !

Syntax

```
{ HOST | SH | ! } [host_command];
```

Description

The HOST statement executes a host operating system command without terminating the current ISQL session.
Arguments

**HOST | SH | !**
Synonyms for directing ISQL to execute an operating system command.

**host_command**
The operating system command to execute. If *host_command* is not specified, ISQL spawns a subshell from which you can issue multiple operating system commands. Use the exit command to return to the ISQL> prompt.

Example

Consider a file in the local directory named query.sql. It contains a complex query that joins several tables in a sample database. From within ISQL You can display the contents of the file with the ISQL ! (shell) statement:

```
ISQL> -- Check the syntax for the UNIX 'more' command:
ISQL> host more
Usage: more [-dfln] [+linenum | +/pattern] name1 name2 ...
ISQL> -- Use 'more' to display the query.sql script file:
ISQL> ! more query.sql
SELECT customers.customer_name,
       orders.order_info,
       orders.order_state,
       lot_staging.lot_location,
       lot_staging.start_date
FROM customers,
     orders,
     lots,
     lot_staging
WHERE ( customers.customer_id = orders.customer_id ) and
       ( lots.lot_id = lot_staging.lot_id ) and
       ( orders.order_id = lots.order_id ) and
       ( customers.customer_name = 'Ship Shapers Inc.' ) AND
       ( lot_staging.start_date is not NULL ) AND
       ( lot_staging.end_date is NULL )
;
ISQL> -- Spawn a subshell process to issue multiple OS commands:
ISQL> sh
.
.
.
```
1.8.14 LIST

Syntax

LIST [ stmt_num ];

Description

The LIST statement displays the statement with the specified statement number from the statement history buffer and makes it the current statement by adding it to the end of the history list.

If LIST omits stmt_num, it displays the last statement in the history buffer.

Example

The following example uses the LIST statement to display the 5th statement in the history buffer (select customer_name from customers) and copy it to the end of the history list. It then executes the now-current statement using the RUN statement:

```
ISQL> history
   1 title
   2 title top "fred" skip 5
   3 title
   4 help title
   5 select customer_name from customers
   6 display "Display on page break!"
   7 display "Test page break display" on page
   8 select customer_name from customers
   9 select customer_name from customers
  10 clear title
ISQL> list 5
select customer_name from customers
ISQL> run
select customer_name from customers
CUSTOMER_NAME
-----------------
Sports Cars Inc.
Mighty Bulldozer Inc.
Ship Shapers Inc.
Tower Construction Inc.
Chemical Construction Inc.
Aerospace Enterprises Inc.
Medical Enterprises Inc.
Rail Builders Inc.
Luxury Cars Inc.
```
1.8.15 QUIT or EXIT

Syntax

QUIT

Description

The QUIT statement terminates the current ISQL session.

Related Statements

QUIT and EXIT are synonymous. There is no difference in their effect.

1.8.16 RUN

Syntax

RUN [stmt_num];

Description

The RUN statement executes the statement with the specified statement number from the statement history buffer and makes it the current statement by adding it to the end of the history list.

If LIST omits stmt_num, it runs the current statement.

Example

The following example runs the fifth statement in the history buffer.

ISQL> HISTORY
  1 title
  2 title top "TEST TITLE" skip 5
  3 title
  4 help title
  5 select customer_name from customers
  6 display "Display on page break!"
  7 display "Test page break display" on page
ISQL> RUN 5
select customer_name from customers
CUSTOMER_NAME
----------
Sports Cars Inc.
Mighty Bulldozer Inc.
Ship Shapers Inc.
Tower Construction Inc.
Chemical Construction Inc.
Aerospace Enterprises Inc.
Medical Enterprises Inc.
Rail Builders Inc.
Luxury Cars Inc.
Office Furniture Inc.
10 records selected
ISQL>

1.8.17 SAVE

Syntax

SAVE filename;

Description

The SAVE statement saves the last statement in the history buffer in filename. The GET and START statements can then be used to read and execute the statement from a file.

If filename does not exist, ISQL creates it. If filename does exist, ISQL overwrites it with the contents of the last statement in the history buffer.

Example

ISQL> ! more test.SQL
  test.sql: No such file or directory
ISQL> select customer_name, customer_city from customers;
  CUSTOMER_NAME                            CUSTOMER_CITY
  -------------                            -------------
  Sports Cars Inc.                                     Sewickley
  Mighty Bulldozer Inc.                                Baldwin Park
  Ship Shapers Inc.                                    South Miami
  Tower Construction Inc.                             Munising
  Chemical Construction Inc.                         Joplin
  Aerospace Enterprises Inc.                         Scottsdale
  Medical Enterprises Inc.                            Denver
  Rail Builders Inc.                                  Claymont
  ...
  ...

ISQL> save test.sql
1.8.18 \textbf{SET}

\textbf{Syntax}

\begin{verbatim}
SET set_option ;
set_option ::= 
  HISTORY number_statements 
  |  PAGESIZE number_lines 
  |  LINESIZE number_characters 
  |  COMMAND LINES number_lines 
  |  REPORT \{ ON \mid OFF \} 
  |  ECHO \{ ON \mid OFF \} 
  |  PAUSE \{ ON \mid OFF \} 
  |  TIME \{ ON \mid OFF \} 
  |  DISPLAY COST \{ ON \mid OFF \} 
  |  AUTOCOMMIT \{ ON \mid OFF \} 
  |  TRANSACTION ISOLATION LEVEL isolation_level 
  |  CONNECTION \{ database_name \mid DEFAULT \}
\end{verbatim}

\textbf{Description}

The \texttt{SET} statement changes various characteristics of an interactive SQL session.

\textbf{Arguments}

\textbf{HISTORY}
Sets the number of statements that ISQL will store in the history buffer. The default, and maximum, is 250 statements.

\textbf{PAGESIZE number_lines}
Sets the number of lines per page. The default is 72 lines. After each \texttt{number_lines} lines, ISQL executes any DISPLAY ON PAGE statements in effect and re-displays column headings. The PAGESIZE setting affects both standard output and the file opened through the SPOOL statement.

\textbf{LINESIZE}
Sets the number of characters per line. The default is 78 characters. The LINESIZE setting affects both standard output and the file opened through the SPOOL statement.

\textbf{COMMAND LINES}
Sets the number of lines to be displayed. The default is 20.
**REPORT ON | OFF**

SET REPORT ON copies only the results of SQL statements to the file opened by the SPOOL filename ON statement. SET REPORT OFF copies both the SQL statement and the results to the file. SET REPORT OFF is the default.

**ECHO ON | OFF**

SET ECHO ON displays SQL statements as well as results to standard output. SET ECHO OFF suppresses the display of SQL statements, so that only results are displayed. SET ECHO OFF is the default.

**PAUSE ON | OFF**

SET PAUSE ON prompts the user after displaying one page of results on the screen. SET PAUSE ON is the default.

**TIME ON | OFF**

SET TIME ON displays the time taken for executing a database query statement. SET TIME OFF disables the display and is the default.

**DISPLAY COST ON | OFF**

SET DISPLAY COST ON displays the values the Dharma SDK optimizer uses to calculate the least-costly query strategy for a particular SQL statement.

The UPDATE STATISTICS statement updates the values displayed by SET DISPLAY COST ON. SET DISPLAY COST OFF suppresses the display and is the default.

**AUTOCOMMIT ON | OFF**

SET AUTOCOMMIT ON commits changes and starts a new transaction immediately after each SQL statement is executed. SET AUTOCOMMIT ON is the default. SET AUTOCOMMIT OFF requires that you end transactions explicitly with a COMMIT or ROLLBACK WORK statement.

**TRANSACTION ISOLATION LEVEL isolation_level**

Specifies the isolation level. Isolation levels specify the degree to which one transaction can modify data or database objects being used by another concurrent transaction. See the SET TRANSACTION ISOLATION LEVEL statement in the *Dharma SDK Reference Manual* for more information on isolation levels.

**CONNECTION { database_name | DEFAULT}**

Sets the active connection to database_name or to the default connection. See the description of the CONNECT statement in the *Dharma SDK Reference Manual* for details on connections.

**Notes**

SET REPORT and SET ECHO are similar:

- SET REPORT affects the SPOOL file only, and ON suppresses statement display
- SET ECHO affects standard output only, and OFF suppresses statement display

Other statements control other characteristics of an interactive SQL session:
• The editor invoked by the EDIT statement is controlled by the value of the environment variable EDITOR.
• The file to which interactive SQL writes output is controlled by the SPOOL filename ON statement.

Examples

ISQL> -- Illustrate PAGESIZE
ISQL> DISPLAY "Here's a page break!" ON PAGE
ISQL> SET PAGESIZE 4
ISQL> BREAK ON PAGE;
ISQL> SELECT TBL FROM SYSTABLES;

TBL
---
sys_chk_constrs
Here's a page break!
TBL
---
sys_chkcol_usage
sys_keycol_usage
Here's a page break!
.
.
.
ISQL> SET DISPLAY COST ON
ISQL> -- Select from the one-record SYSCALCTABLE table:
ISQL> SELECT * FROM SYSCALCTABLE;

Estimated Cost Values :
-----------------------
   COST    : 8080
   CARDINALITY : 200
   TREE SIZE   : 3072

  FLD
---
100

1.8.18.1 ISQL Configuration file - sql_conf

ISQL can be configured to startup with the various characteristics automatically set, by means of a configuration file. The configuration file sql_conf is located in the installed_dir/lib directory. The characteristics set in the configuration file are inherited
by all the interactive SQL sessions.

Sample entries in sql_conf:
ISQL_HISTORY = 250
ISQL_CMD_LINES = 20
ISQL_PAUSE = ON

The configuration file can be edited to change any of the characteristics. The following table lists the various settable parameters.

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>EQUIVALENT ISQL SET COMMAND</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISQL_HISTORY</td>
<td>SET HISTORY</td>
<td>Sets the number of statements that ISQL will store in the history buffer. The default, and maximum, is 250 statements.</td>
</tr>
<tr>
<td>ISQL_PAGESIZE</td>
<td>SET PAGESIZE</td>
<td>Sets the number of lines per page. The PAGESIZE setting affects both standard output and the file opened through the SPOOL statement. The default is 72 lines.</td>
</tr>
<tr>
<td>ISQL_LINESIZE</td>
<td>SET LINESIZE</td>
<td>Sets the number of characters per line. The LINESIZE setting affects both standard output and the file opened through the SPOOL statement. The default is 78 characters.</td>
</tr>
<tr>
<td>ISQL_CMD_LINES</td>
<td>SET COMMAND LINES</td>
<td>Sets the number of lines to be displayed. The default is 20.</td>
</tr>
<tr>
<td>ISQL_REPORT</td>
<td>SET REPORT</td>
<td>Setting this to Y copies only the results of SQL statements to the SPOOL file. Setting this to N copies both the SQL statement and the results to the file. N is the default.</td>
</tr>
<tr>
<td>ISQL_ECHO</td>
<td>SET ECHO</td>
<td>Setting this to Y, displays SQL statements as well as results to standard output. Setting this to N, suppresses the display of SQL statements, so that only results are displayed. N is the default.</td>
</tr>
<tr>
<td>ISQL_PAUSE</td>
<td>SET PAUSE</td>
<td>Setting this to ON prompts the user after displaying one page of results on the screen. ON is the default.</td>
</tr>
<tr>
<td>ISQL_TIME</td>
<td>SET TIME</td>
<td>Setting this to ON displays the time taken for executing a database query statement. Setting it to OFF disables the display. OFF is the default.</td>
</tr>
</tbody>
</table>
1.8.19  SHOW

Syntax

SHOW [ show_option | SPOOL ] ;

show_option ::

  HISTORY
  | PAGESIZE
  | LINESIZE
  | COMMAND LINES
  | REPORT
  | ECHO
  | PAUSE
  | TIME
  | DISPLAY COST
  | AUTOCOMMIT
  | TRANSACTION ISOLATION LEVEL
  | CONNECTION

Description

The SHOW statement displays the values of the various settings controlled by corresponding SET and SPOOL statements. If the SHOW statement omits show_option, it displays all the ISQL settings currently in effect.

See the SET (page 1-37), SPOOL (page 1-42), and EDIT (page 1-28) statements for details on the settings displayed by the SHOW statement.

Example

ISQL> SHOW

ISQL ENVIRONMENT

__________________________________________________________________________
EDITOR ....................... : vi
HISTORY buffer size ........ : 50   PAUSE ......................... : ON
COMMAND LINES .............. : 10   TIMEing command execution ... : OFF
SPOOLing .................... : ON   LINESIZE .................... : 78
REPORTing Facility .......... : ON   PAGESIZE .................... : 72
Spool File ................... : spool_file
AUTOCOMMIT ................... : OFF   ECHO commands ............... : ON
TRANSACTION ISOLATION LEVEL .. : 0 (Snapshot)
DATABASE CONNECTIONS
### DATABASE CONNECTION NAME IS DEFAULT ? IS CURRENT ?

<table>
<thead>
<tr>
<th>DATABASE</th>
<th>CONNECTION NAME</th>
<th>IS DEFAULT</th>
<th>IS CURRENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>salesdb</td>
<td>conn_1</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### 1.8.20 SPOOL

**Syntax**

SPOOL filename [ON] ;  
SPOOL OFF ;  
SPOOL OUT ;

**Description**

The SPOOL statement writes output from interactive SQL statements to the specified file.

**Arguments**

- **filename ON**
  
  Opens the file specified by filename and writes the displayed output into that file. The filename cannot include punctuation marks such as a period (.) or comma (,).

- **OFF**
  
  Closes the file opened by the SPOOL ON statement.

- **OUT**
  
  Closes the file opened by the SPOOL ON statement and prints the file. The SPOOL OUT statement passes the file to the system utility statement pr and the output is piped to `lpr`.

**Example**

To record the displayed output into the file called STK, enter:

```
ISQL> SPOOL STK ON ;

ISQL> SELECT * FROM customer ;

ISQL> SPOOL OFF ;
```

### 1.8.21 START

**Syntax**

START filename [argument] [ ... ] ;

**Description**

The START statement executes the first SQL statement stored in the specified script file.
Arguments

**filename**
The name of the script file. ISQL reads the file until it encounters a semicolon ( ; ) statement terminator.

**argument …**
ISQL substitutes the value of argument for parameter references in the script. Parameter references in a script are of the form &n, where n is an integer. ISQL replaces all occurrences of &1 in the script with the first argument value, all occurrences of &2 with the second argument value, and so on. The value of argument must not contain spaces or other special characters.

Notes

- In addition to executing the first statement in the script file, the START statement appends the statement (after any argument substitution) to the history buffer.
- The GET, START, and @ (execute) statements are similar in that they all read SQL script files. Both GET and START read an SQL script file and append the first statement in it to the history buffer. However, the START statement also executes the script statement and accepts arguments that it substitutes for parameter references in the script statement. The @ (execute) statement, on the other hand, executes all the statements in an SQL script file but does not add any of the statements to the history buffer. The @ statement does not support argument substitution.

Example

```
ISQL> -- Nothing in history buffer:
ISQL> history
History queue is empty.
ISQL> -- Display a script file with the ! shell statement. The script's SQL
ISQL> -- statement uses the LIKE predicate to retrieve customer names
ISQL> -- beginning with the string passed as an argument in a START statement:
ISQL> ! more start_ex.sql
SELECT customer_name FROM customers
WHERE customer_name LIKE '&1%';
ISQL> -- Use the START statement to execute the SQL statement in the script
ISQL> -- start_ex.sql. Supply the value 'Ship' as a substitution argument:
ISQL> START start_ex.sql Ship
CUSTOMER_NAME
-------------
Ship Shapers Inc.
1 record selected
ISQL> -- ISQL puts the script statement, after argument substitution, in the history buffer:
ISQL> history
```
1.8.22 TABLE

Syntax

T[ABLE] [ tablename ] ;

Description

The TABLE statement with no argument displays a list of all the user tables in the database that are owned by the current user.

With the tablename argument, the TABLE statement displays a brief description of the columns in the specified table.

Examples

You can use the TABLE statement to see the structure of system tables. Unless you are logged in as the Dharma database administrator (the user dharma, by default), you need to qualify the system table name with the administrator user name, as in the following example:

```
ISQL> table dharma.systables

<table>
<thead>
<tr>
<th>COLNAME</th>
<th>NULL ?</th>
<th>TYPE</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>NOT NULL</td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>tbl</td>
<td>NOT NULL</td>
<td>VARCHAR</td>
<td>32</td>
</tr>
<tr>
<td>creator</td>
<td>NOT NULL</td>
<td>VARCHAR</td>
<td>32</td>
</tr>
<tr>
<td>owner</td>
<td>NOT NULL</td>
<td>VARCHAR</td>
<td>32</td>
</tr>
<tr>
<td>tbltype</td>
<td>NOT NULL</td>
<td>VARCHAR</td>
<td>1</td>
</tr>
<tr>
<td>tblpctfree</td>
<td>NOT NULL</td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>segid</td>
<td>NOT NULL</td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>has_pcnstrs</td>
<td>NOT NULL</td>
<td>VARCHAR</td>
<td>1</td>
</tr>
<tr>
<td>has_fcnstrs</td>
<td>NOT NULL</td>
<td>VARCHAR</td>
<td>1</td>
</tr>
<tr>
<td>has_ccnstrs</td>
<td>NOT NULL</td>
<td>VARCHAR</td>
<td>1</td>
</tr>
<tr>
<td>has_ucnstrs</td>
<td>NOT NULL</td>
<td>VARCHAR</td>
<td>1</td>
</tr>
<tr>
<td>tbl_status</td>
<td>NOT NULL</td>
<td>VARCHAR</td>
<td>1</td>
</tr>
<tr>
<td>rssid</td>
<td>NOT NULL</td>
<td>INT</td>
<td>4</td>
</tr>
</tbody>
</table>
```

The following example uses the table command to detail the structure of the tables used in examples throughout this chapter.

```
ISQL> table  - List the sample tables

<table>
<thead>
<tr>
<th>TABLENAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>customers</td>
</tr>
<tr>
<td>lot_staging</td>
</tr>
<tr>
<td>lots</td>
</tr>
</tbody>
</table>
```
orders
quality
samples

ISQL> table customers

<table>
<thead>
<tr>
<th>COLNAME</th>
<th>NULL ?</th>
<th>TYPE</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>customer_id</td>
<td>NOT NULL</td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>customer_name</td>
<td></td>
<td>CHAR</td>
<td>50</td>
</tr>
<tr>
<td>customer_street</td>
<td></td>
<td>CHAR</td>
<td>100</td>
</tr>
<tr>
<td>customer_city</td>
<td></td>
<td>CHAR</td>
<td>50</td>
</tr>
<tr>
<td>customer_state</td>
<td></td>
<td>CHAR</td>
<td>10</td>
</tr>
<tr>
<td>customer_zip</td>
<td></td>
<td>CHAR</td>
<td>5</td>
</tr>
</tbody>
</table>

ISQL> table orders

<table>
<thead>
<tr>
<th>COLNAME</th>
<th>NULL ?</th>
<th>TYPE</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>order_id</td>
<td>NOT NULL</td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>customer_id</td>
<td></td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>steel_type</td>
<td></td>
<td>CHAR</td>
<td>20</td>
</tr>
<tr>
<td>order_info</td>
<td></td>
<td>CHAR</td>
<td>200</td>
</tr>
<tr>
<td>order_weight</td>
<td></td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>order_value</td>
<td></td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>order_state</td>
<td></td>
<td>CHAR</td>
<td>20</td>
</tr>
</tbody>
</table>

ISQL> table lots

<table>
<thead>
<tr>
<th>COLNAME</th>
<th>NULL ?</th>
<th>TYPE</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>lot_id</td>
<td>NOT NULL</td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>order_id</td>
<td>NOT NULL</td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>lot_units</td>
<td></td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>lot_info</td>
<td></td>
<td>CHAR</td>
<td>200</td>
</tr>
</tbody>
</table>

ISQL> table lot_staging

<table>
<thead>
<tr>
<th>COLNAME</th>
<th>NULL ?</th>
<th>TYPE</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>lot_id</td>
<td></td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>lot_location</td>
<td></td>
<td>CHAR</td>
<td>20</td>
</tr>
<tr>
<td>start_date</td>
<td></td>
<td>DATE</td>
<td></td>
</tr>
<tr>
<td>end_date</td>
<td></td>
<td>DATE</td>
<td></td>
</tr>
<tr>
<td>issues</td>
<td></td>
<td>CHAR</td>
<td>200</td>
</tr>
</tbody>
</table>

ISQL> table quality

<table>
<thead>
<tr>
<th>COLNAME</th>
<th>NULL ?</th>
<th>TYPE</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>lot_id</td>
<td>NOT NULL</td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>purity</td>
<td></td>
<td>DOUBLE</td>
<td>8</td>
</tr>
<tr>
<td>p_deviation</td>
<td></td>
<td>DOUBLE</td>
<td>8</td>
</tr>
<tr>
<td>strength</td>
<td></td>
<td>DOUBLE</td>
<td>8</td>
</tr>
<tr>
<td>s_deviation</td>
<td></td>
<td>DOUBLE</td>
<td>8</td>
</tr>
<tr>
<td>comments</td>
<td></td>
<td>CHAR</td>
<td>200</td>
</tr>
</tbody>
</table>
ISQL> table samples

<table>
<thead>
<tr>
<th>COLNAME</th>
<th>NULL</th>
<th>TYPE</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>lot_id</td>
<td></td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>samples</td>
<td></td>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>comments</td>
<td></td>
<td>CHAR</td>
<td>200</td>
</tr>
</tbody>
</table>

1.8.23 TITLE

Syntax

TITLE [ [ TOP | BOTTOM ] [ [ LEFT | CENTER | RIGHT | COL n ] " text " ] [ … ] [ SKIP n ] ] ;

Description

The TITLE statement specifies text that ISQL displays either before or after it processes a query. TITLE with no arguments displays the titles currently set, if any.

Arguments

TOP | BOTTOM
Specifies whether the title is to be printed at the top or bottom of the page. The default is TOP.

LEFT | CENTER | RIGHT | COL n
Specifies the horizontal alignment of the title text: LEFT aligns the text to the left of the display; CENTER centers the text; RIGHT aligns the text to the right (with the right-most character in the column specified by the SET LINESIZE statement). COL n displays the text starting at the specified column (specifying COL 0 is the same as LEFT).

The default is LEFT.

" text "
The text to be displayed.

SKIP n
Skips the specified number of lines after a TOP title is printed and before a BOTTOM title is printed. By default, ISQL does not skip any lines.

Examples

The following example shows the effect of specifying a top title without a bottom title, then both a top and bottom title.
ISQL> TITLE "fred"
ISQL> select * from syscalctable;
fred

<table>
<thead>
<tr>
<th>FLD</th>
<th>---</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
1 record selected

ISQL> TITLE BOTTOM "flintstone"
ISQL> select * from syscalctable;
fred

<table>
<thead>
<tr>
<th>FLD</th>
<th>---</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
flintstone
1 record selected

The TITLE statement can specify separate positions for different text in the same title:

ISQL> CLEAR TITLE
ISQL> TITLE TOP LEFT "Align on the left!" CENTER "Centered text" RIGHT "Right aligned text!"
ISQL> select * from syscalctable;
Align on the left! Centered text Right aligned text!

<table>
<thead>
<tr>
<th>FLD</th>
<th>---</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
1 record selected
Symbols
@Execute syntax 1-12
A
Adding titles 1-10
B
Beginning titles 1-10
BREAK statement 1-4
BREAK statement syntax 1-13
C
CLEAR statement 1-4
CLEAR statement syntax 1-16
COLUMN display formatting 1-6
COLUMN statement 1-4
COLUMN statement date-time formats 1-19
COLUMN statement numeric formats 1-19
COLUMN statement syntax 1-18
Commands file 2-3, 3-2
COMPUTE statement 1-4
COMPUTE statement syntax 1-23
Concluding titles 1-10
D
Data file formats for dbdump 3-2
Data file formats for dbload 2-3
Data summaries 1-7
Date-time formats for COLUMN statement 1-19
dbdump
  commands file 3-2
  data file formats 3-2
  DEFINE RECORDS statement 3-3
  examples 3-5
  execution process diagram 3-1
  fixed length records 3-2
  FOR EACH statement 3-4
  overview 3-1
  prerequisites 3-1
  syntax 3-1
  variable length records 3-2
dbload
  commands file 2-3
  data file formats 2-3
  DEFINE RECORDS statement 2-4
  errors 2-8
  examples 2-6
  execution process diagram 2-1
  fixed length records 2-3
  FOR EACH statement 2-5
overview 2-1
prerequisites 2-2
syntax 2-2
variable length records 2-3
dbschema
  examples 4-2
  overview 4-1
  syntax 4-1
DEFINE RECORDS statement 2-4, 3-3
DEFINE statement 1-4
DEFINE statement syntax 1-24
DISPLAY statement 1-4
DISPLAY statement syntax 1-25
E
EDIT statement 1-3
EDIT statement syntax 1-27
Errors
dbload 2-8
EXIT statement syntax 1-28
F
Fixed length records for dbdump 3-2
Fixed length records for dbload 2-3
FOR EACH statement 2-5, 3-4
Formatting column displays 1-6
Formatting ISQL output 1-3
G
GET statement 1-3
GET statement syntax 1-29
H
HELP statement syntax 1-30
HISTORY statement 1-3
HISTORY statement syntax 1-31
HOST statement syntax 1-32
I
ISQL
  definition 1-1
  output formats 1-3
  reference 1-12
  starting 1-1
  statements for query formatting 1-4
  syntax 1-2
  usage 1-1
L
LIST statement 1-3
LIST statement syntax 1-33
Load records using dbload 2-1

N
Numeric formats for COLUMN statement 1-19

O
Output formats 1-3

Q
Queries, unformatted 1-5
QUIT statement syntax 1-28

R
Recreate database elements and data using dbschema 4-1
References for ISQL 1-12
RUN statement 1-3
RUN statement syntax 1-34

S
SAVE statement 1-3
SAVE statement syntax 1-35
SET ECHO statement 1-4
SET LINESIZE statement 1-4
SET PAGESIZE statement 1-4
SET REPORT statement 1-4
SET statement syntax 1-36
SHOW statement syntax 1-39
SPOOL statement syntax 1-40
START statement 1-3
START statement syntax 1-41
Starting ISQL 1-1
Statement history support 1-2
ISQL statements 1-3

Statements
@EXECUTE syntax 1-12
BREAK 1-4, 1-7, 1-13
BREAK syntax 1-13
CLEAR 1-4, 1-16
CLEAR syntax 1-16
COLUMN 1-4, 1-6, 1-18
COLUMN date-time formats 1-19
COLUMN numeric formats 1-19
COLUMN syntax 1-18
COMPUTE 1-4, 1-7, 1-23
COMPUTE syntax 1-23
DEFINE 1-4, 1-24
DEFINE RECORD 2-4, 3-3
DEFINE syntax 1-24
DISPLAY 1-4, 1-7, 1-25
DISPLAY syntax 1-25
EDIT 1-3, 1-27
EDIT syntax 1-27
EXIT 1-28
EXIT syntax 1-28
FOR EACH 2-5, 3-4
GET 1-3, 1-29
GET syntax 1-29
HELP 1-11, 1-30
HELP syntax 1-30
HISTORY 1-3, 1-31
HISTORY syntax 1-31
HOST 1-32
HOST syntax 1-32
LIST 1-3, 1-33
LIST syntax 1-33
QUIT 1-28
QUIT syntax 1-28
RUN 1-3, 1-34
RUN syntax 1-34
SAVE 1-3, 1-35
SAVE syntax 1-35
SET 1-36
SET ECHO 1-4
SET LINESIZE 1-4
SET PAGESIZE 1-4
SET REPORT 1-4
SET syntax 1-36
SHOW 1-39
SHOW syntax 1-39
SPOOL 1-40
SPOOL syntax 1-40
START 1-3, 1-41
START syntax 1-41
TABLE 1-11, 1-42
TABLE syntax 1-42
TITLE 1-4, 1-44
TITLE syntax 1-44
TITLES 1-10

Statements for query formatting 1-4
Summarizing data 1-7
Syntax for ISQL 1-2

T
TABLE statement syntax 1-42
TITLE statement 1-4
TITLE statement syntax 1-44
Titles
adding 1-10
beginning 1-10
concluding 1-10
Transaction support 1-12

U
Unformatted queries 1-5

V
Variable length records for dbsdump 3-2
Variable length records for dbload 2-3

W
Write to a database using dbload 3-1