1

Writing Basic SQL Statements

Objectives

At the end of this lesson, you should be able to:

- List the capabilities of SQL SELECT statements
- Execute a basic SELECT statement
- Differentiate between SQL statements and SQL*Plus commands

Capabilities of SQL SELECT Statements

Selection

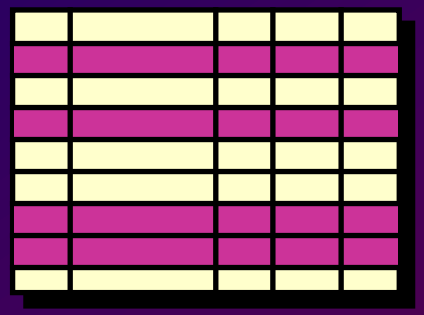

Table 1

Projection

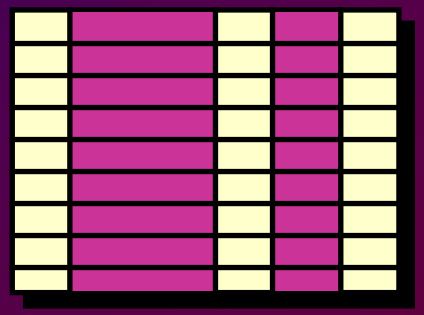

Table 1

Join

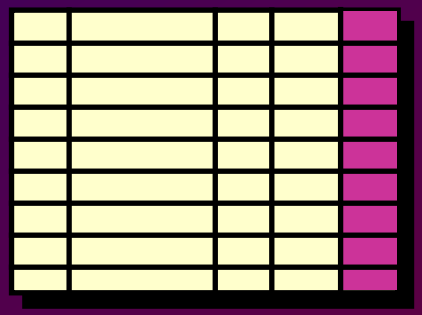

Table 1

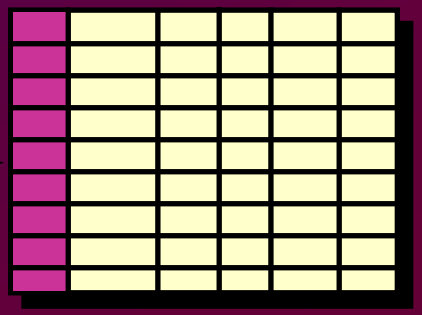

Table 2

Basic SELECT Statement

```
SELECT    [DISTINCT] {*, column [alias],...}
FROM      table;
```

- SELECT identifies *what* columns
- FROM identifies *which* table

Writing SQL Statements

- SQL statements are not case sensitive.
- SQL statements can be on one or more lines.
- Keywords cannot be abbreviated or split across lines.
- Clauses are usually placed on separate lines.
- Tabs and indents are used to enhance readability.

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Selecting All Columns

```
SQL> SELECT *
  2  FROM   dept;
```

```
   DEPTNO DNAME          LOC
--------- -------------- -------------
       10 ACCOUNTING     NEW YORK
       20 RESEARCH       DALLAS
       30 SALES          CHICAGO
       40 OPERATIONS     BOSTON
```

Selecting Specific Columns

```
SQL> SELECT deptno, loc
  2  FROM   dept;
```

```
   DEPTNO LOC
--------- -------------
       10 NEW YORK
       20 DALLAS
       30 CHICAGO
       40 BOSTON
```

Column Label Defaults

- Default justification
  - Left: Date and character data
  - Right: Numeric data
- Default display: Uppercase

Arithmetic Expressions

Create expressions on NUMBER and DATE data types by using arithmetic operators.

Operator	Description
+	Add
-	Subtract
*	Multiply
/	Divide

Using Arithmetic Operators

```
SQL> SELECT ename, sal, sal+300
  2  FROM   emp;
```

```
ENAME             SAL   SAL+300
---------- --------- ---------
KING             5000      5300
BLAKE            2850      3150
CLARK            2450      2750
JONES            2975      3275
MARTIN           1250      1550
ALLEN            1600      1900
...
14 rows selected.
```

Operator Precedence

* / + –

- Multiplication and division take priority over addition and subtraction.
- Operators of the same priority are evaluated from left to right.
- Parentheses are used to force prioritized evaluation and to clarify statements.

Operator Precedence

```
SQL> SELECT ename, sal, 12*sal+100
  2  FROM   emp;
```

```
ENAME             SAL 12*SAL+100
---------- --------- ----------
KING             5000      60100
BLAKE            2850      34300
CLARK            2450      29500
JONES            2975      35800
MARTIN           1250      15100
ALLEN            1600      19300
...
14 rows selected.
```

Using Parentheses

```
SQL> SELECT ename, sal, 12*(sal+100)
  2  FROM   emp;
```

```
ENAME             SAL 12*(SAL+100)
---------- --------- ------------
KING             5000        61200
BLAKE            2850        35400
CLARK            2450        30600
JONES            2975        36900
MARTIN           1250        16200
...
14 rows selected.
```

Defining a Null Value

- A null is a value that is unavailable, unassigned, unknown, or inapplicable.
- A null is not the same as zero or a blank space.

```
SQL> SELECT   ename, job, comm
  2  FROM     emp;
```

```
ENAME      JOB         COMM
---------- --------- ---------
KING       PRESIDENT
BLAKE      MANAGER
...
TURNER     SALESMAN         0
...
14 rows selected.
```

Null Values in Arithmetic Expressions

Arithmetic expressions containing a null value evaluate to null.

```
SQL> select ename NAME, 12*sal+comm
  2  from   emp
  3  WHERE  ename='KING';
```

```
NAME       12*SAL+COMM
---------- -----------
KING
```

Defining a Column Alias

- Renames a column heading
- Is useful with calculations
- Immediately follows column name; optional AS keyword between column name and alias
- Requires double quotation marks if it contains spaces or special characters or is case sensitive

Using Column Aliases

```
SQL> SELECT ename AS name, sal salary
  2  FROM   emp;
```

```
NAME                 SALARY
-------------- ----------
...
```

```
SQL> SELECT ename "Name",
  2         sal*12 "Annual Salary"
  3  FROM   emp;
```

```
Name           Annual Salary
-------------- -------------
...
```

Concatenation Operator

- Concatenates columns or character strings to other columns
- Is represented by two vertical bars (||)
- Creates a resultant column that is a character expression

Using the Concatenation Operator

```
SQL> SELECT   ename||job AS "Employees"
  2  FROM     emp;
```

```
Employees
--------------------
KINGPRESIDENT
BLAKEMANAGER
CLARKMANAGER
JONESMANAGER
MARTINSALESMAN
ALLENSALESMAN
...
14 rows selected.
```

Literal Character Strings

- A literal is a character, expression, or number included in the SELECT list.
- Date and character literal values must be enclosed within single quotation marks.
- Each character string is output once for each row returned.

Using Literal Character Strings

```
SQL> SELECT ename ||' '||'is a'||' '||job
  2                AS "Employee Details"
  3  FROM   emp;
```

```
Employee Details
-------------------------
KING is a PRESIDENT
BLAKE is a MANAGER
CLARK is a MANAGER
JONES is a MANAGER
MARTIN is a SALESMAN
...
14 rows selected.
```

Duplicate Rows

The default display of queries is all rows, including duplicate rows.

```
SQL> SELECT deptno
  2  FROM   emp;
```

```
   DEPTNO
---------
       10
       30
       10
       20
...
14 rows selected.
```

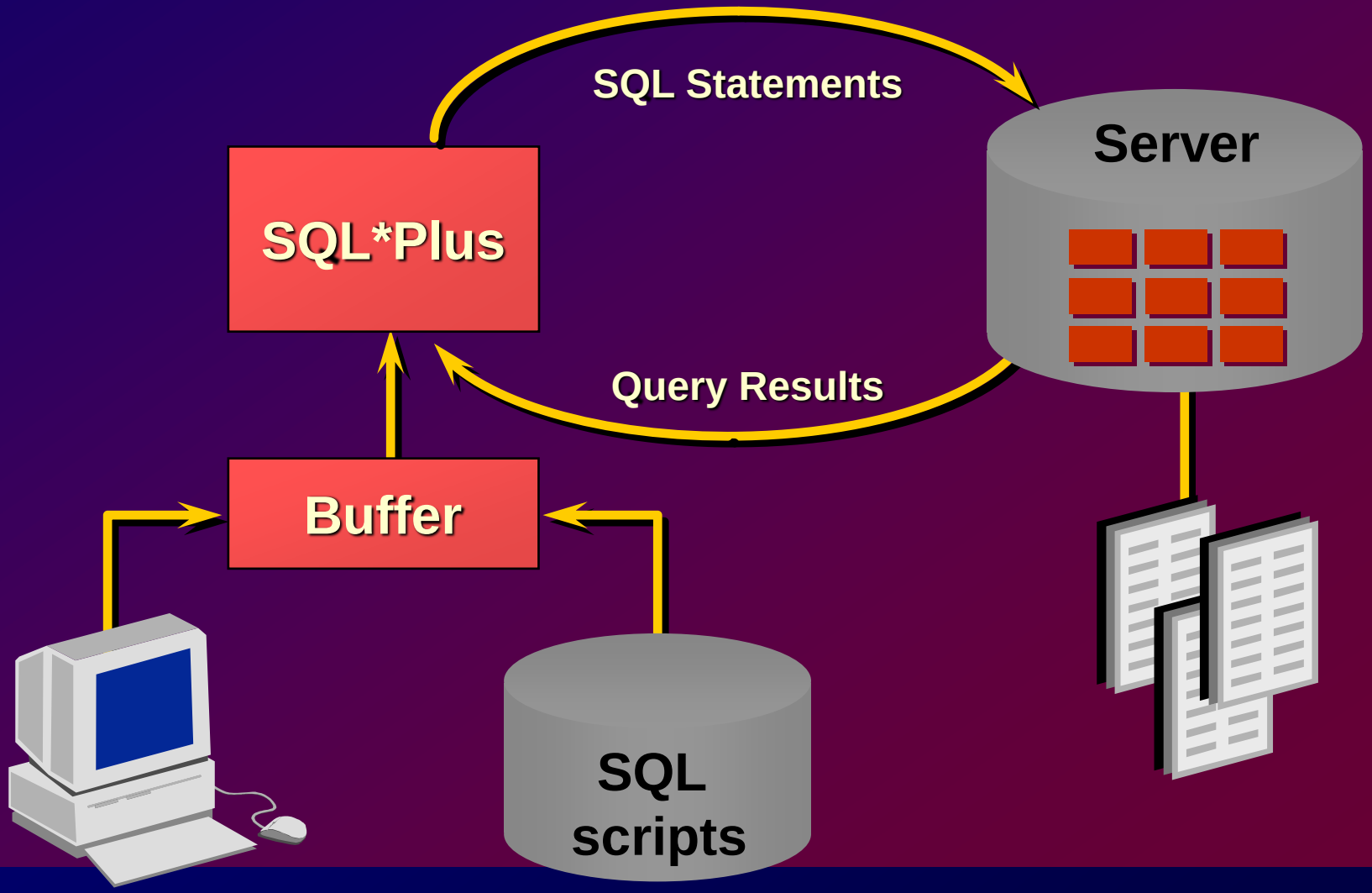
Eliminating Duplicate Rows

Eliminate duplicate rows by using the DISTINCT keyword in the SELECT clause.

```
SQL> SELECT DISTINCT deptno
  2  FROM   emp;
```

```
    DEPTNO
---------
        10
        20
        30
```

SQL and SQL*Plus Interaction



SQL Statements Versus SQL*Plus Commands

SQL

- A language
- ANSI standard
- Keyword cannot be abbreviated
- Statements manipulate data and table definitions in the database

SQL*Plus

- An environment
- Oracle proprietary
- Keywords can be abbreviated
- Commands do not allow manipulation of values in the database

SQL statements → SQL buffer

SQL*Plus commands → ~~SQL*Plus buffer~~

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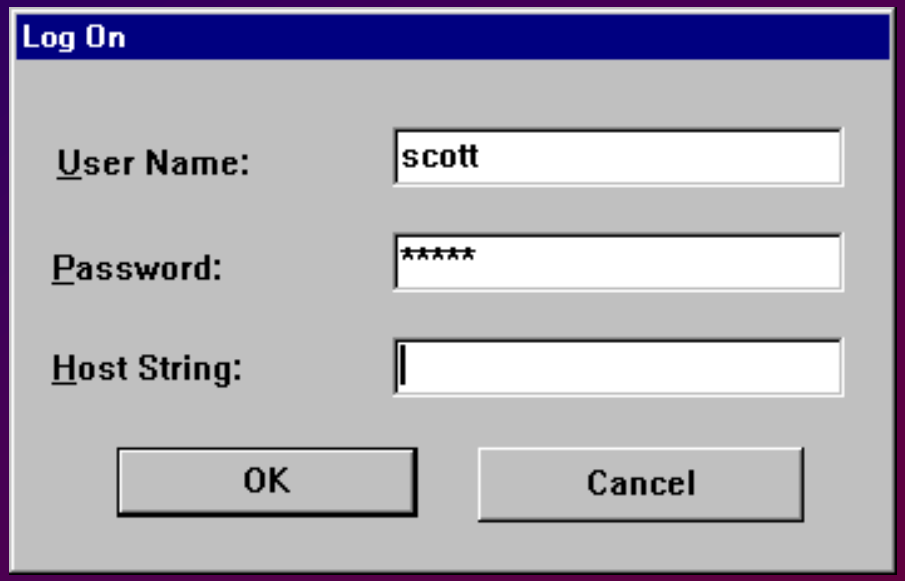
Overview of SQL*Plus

- Log in to SQL*Plus.
- Describe the table structure.
- Edit your SQL statement.
- Execute SQL from SQL*Plus.
- Save SQL statements to files and append SQL statements to files.
- Execute saved files.
- Load commands from file to buffer to edit.

Logging In to SQL*Plus

- From Windows environment:



- From command line:

sqlplus [*username*[/*password* [@*database*]]]

Displaying Table Structure

Use the SQL*Plus DESCRIBE command to display the structure of a table.

```
DESC[RIBE] tablename
```

Displaying Table Structure

```
SQL> DESCRIBE dept
```

```
Name                    Null?    Type
----------------------- -------- ----
DEPTNO                  NOT NULL NUMBER(2)
DNAME                            VARCHAR2(14)
LOC                              VARCHAR2(13)
```

SQL*Plus Editing Commands

- A[PPEND] *text*
- C[HANGE] */ old / new*
- C[HANGE] */ text /*
- CL[EAR] BUFF[ER]
- DEL
- DEL *n*
- DEL *m n*

SQL*Plus Editing Commands

- I[NPUT]
- I[NPUT] *text*
- L[IST]
- L[IST] *n*
- L[IST] *m n*
- R[UN]
- *n*
- *n text*
- 0 *text*

SQL*Plus File Commands

- SAVE *filename*
- GET *filename*
- START *filename*
- @ *filename*
- EDIT *filename*
- SPOOL *filename*
- EXIT

Summary

```
SELECT    [DISTINCT] {*,column[alias],...}
FROM      table;
```

Use SQL*Plus as an environment to:

- Execute SQL statements
- Edit SQL statements

Practice Overview

- Selecting all data from different tables.
- Describing the structure of tables.
- Performing arithmetic calculations and specifying column names.
- Using SQL*Plus editor.