



Writing Basic SQL SELECT Statements

Objectives

After completing this lesson, you should be able to do the following:

- List the capabilities of SQL `SELECT` statements
- Execute a basic `SELECT` statement

Capabilities of SQL `SELECT` Statements

Projection

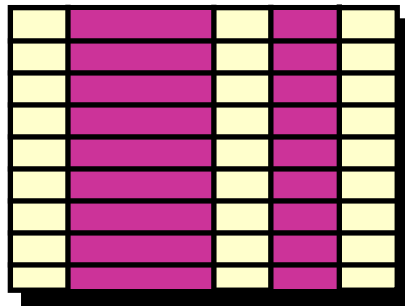


Table 1

Selection

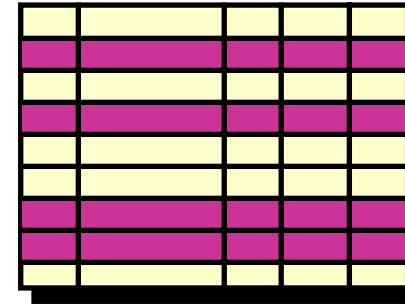


Table 1

Join

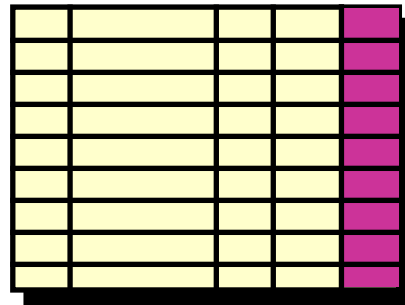


Table 1

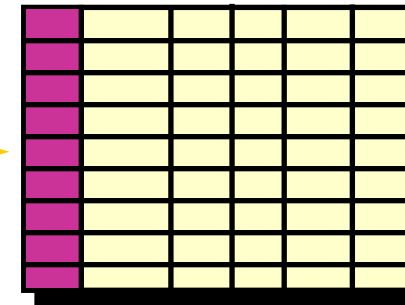


Table 2

Basic SELECT Statement

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

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

Selecting All Columns

```
SELECT *  
FROM departments;
```

DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
10	Administration	200	1700
20	Marketing	201	1800
50	Shipping	124	1500
60	IT	103	1400
80	Sales	149	2500
90	Executive	100	1700
110	Accounting	205	1700
190	Contracting		1700

8 rows selected.

Selecting Specific Columns

```
SELECT department_id, location_id
FROM departments;
```

DEPARTMENT_ID	LOCATION_ID
10	1700
20	1800
50	1500
60	1400
80	2500
90	1700
110	1700
190	1700

8 rows selected.



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.
- Indents are used to enhance readability.

Arithmetic Expressions

Create expressions with number and date data by using arithmetic operators.

Operator	Description
+	Add
-	Subtract
*	Multiply
/	Divide

Using Arithmetic Operators

```
SELECT last_name, salary, salary + 300
FROM   employees;
```

LAST_NAME	SALARY	SALARY+300
King	24000	24300
Kochhar	17000	17300
De Haan	17000	17300
Hunold	9000	9300
Ernst	6000	6300
...		
Hartstein	13000	13300
Fay	6000	6300
Higgins	12000	12300
Gietz	8300	8600

20 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

```
SELECT last_name, salary, 12*salary+100
FROM   employees;
```

LAST_NAME	SALARY	12*SALARY+100
King	24000	288100
Kochhar	17000	204100
De Haan	17000	204100
Hunold	9000	108100
Ernst	6000	72100

...

Hartstein	13000	156100
Fay	6000	72100
Higgins	12000	144100
Gietz	8300	99700

20 rows selected.

Using Parentheses

```
SELECT last_name, salary, 12*(salary+100)
FROM   employees;
```

LAST_NAME	SALARY	12*(SALARY+100)
King	24000	289200
Kochhar	17000	205200
De Haan	17000	205200
Hunold	9000	109200
Ernst	6000	73200
...		
Hartstein	13000	157200
Fay	6000	73200
Higgins	12000	145200
Gietz	8300	100800

20 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.

```
SELECT last_name, job_id, salary, commission_pct  
FROM employees;
```

LAST_NAME	JOB_ID	SALARY	COMMISSION_PCT
King	AD_PRES	24000	
Kochhar	AD_VP	17000	
...			
Zlotkey	SA_MAN	10500	.2
Abel	SA_REP	11000	.3
Taylor	SA_REP	8600	.2
...			
Gietz	AC_ACCOUNT	8300	

20 rows selected.

Null Values in Arithmetic Expressions

Arithmetic expressions containing a null value evaluate to null.

```
SELECT last_name, 12*salary*commission_pct  
FROM employees;
```

Kochhar	
King	
LAST_NAME	12*SALARY*COMMISSION_PCT
...	
Zlotkey	25200
Abel	39600
Taylor	20640
...	
Gietz	

20 rows selected.



Defining a Column Alias

A column alias:

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

Using Column Aliases

```
SELECT last_name AS name, commission_pct comm
FROM employees;
```

NAME	COMM
King	
Kochhar	
De Haan	

...

20 rows selected.

```
SELECT last_name "Name", salary*12 "Annual Salary"
FROM employees;
```

Name	Annual Salary
King	288000
Kochhar	204000
De Haan	204000

...

20 rows selected.

Concatenation Operator

A 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

```
SELECT last_name||job_id AS "Employees"  
FROM employees;
```

Employees
KingAD_PRES
KochharAD_VP
De HaanAD_VP
HunoldIT_PROG
ErnstIT_PROG
LorentzIT_PROG
MourgosST_MAN
RajsST_CLERK

...

20 rows selected.



Literal Character Strings

- A literal is a character, a number, or a date 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

```
SELECT last_name || ' is a ' || job_id  
       AS "Employee Details"  
FROM   employees;
```

Employee Details
King is a AD_PRES
Kochhar is a AD_VP
De Haan is a AD_VP
Hunold is a IT_PROG
Ernst is a IT_PROG
Lorentz is a IT_PROG
Mourgos is a ST_MAN
Rajs is a ST_CLERK

...

20 rows selected.

Duplicate Rows

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

```
SELECT department_id
FROM employees;
```

DEPARTMENT_ID	
	90
	90
	90
	60
	60
	60
	50
	50
	50

...
20 rows selected.

Eliminating Duplicate Rows

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

```
SELECT DISTINCT department_id  
FROM employees;
```

DEPARTMENT_ID	
	10
	20
	50
	60
	80
	90
	110

8 rows selected.

Summary

In this lesson, you should have learned how to:

- Write a **SELECT** statement that:
 - Returns all rows and columns from a table
 - Returns specified columns from a table
 - Uses column aliases to give descriptive column headings

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

