BIC 21404 DATABASE SYSTEM

LAB SHEET 3

Title	: Creating and managing tables
Objectives	: At the end of the session, students are able to: i. Load SQL script file ii. Use basic select statement iii. Use arithmetic expressions in SQL statements
Duration	: 2 Hours

Create HR Schema Objects Using Script File

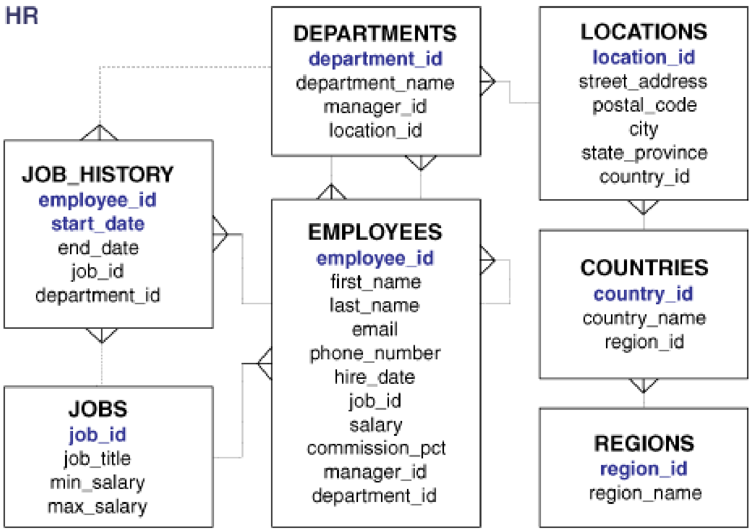


Figure 3-1: HR Schema

1. Download HR_main.sql
2. Copy HR_main.sql to c:\
3. Run SQL Command Line.
4. Connect as the SYSTEM user
5. Run the sript:

```
SQL>@C:\HR_main.sql
```

Writing SQL Statements

- SQL statements are not case sensitive
- SQL statements can be entered 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
- SQL statement is terminated by a semicolon (;)

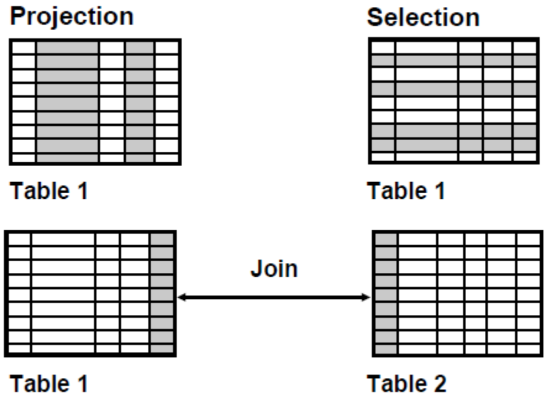
- Keyword typically are entered in uppercase ; all other words, such as table names and columns names are entered in lowercase.

Capabilities of SELECT statement

.

A SELECT statement retrieves information from the database. With a SELECT statement, you can do the following:

- **Projection**: Select the columns in a table that are returned by a query. Select as few or as many of the columns as required.
- **Selection**: Select the rows in a table that are returned by a query. Various criteria can be used to restrict the rows that are retrieved.
- **Joins**: Bring together data that is stored in different tables by specifying the link between them.



Basic SELECT statement

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

- SELECT identifies the columns to be displayed.
- FROM identifies the table containing those columns.

Try this: Selecting All Columns

```
SELECT *
FROM departments;
```

Try this: Selecting Specific Columns

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

Arithmetic Expressions

Expressions with number and date data can be created by using arithmetic operators.

Try this:

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

Operator Precedence

- Multiplication and division occur before addition and subtraction
- Operators of the same priority are evaluated from left to right
- Parentheses are used to override the default precedence or to clarify the statement.

Try this:

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

Now, try this:

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

What are the differences between statement 1 and statement 2?

Column Alias

A column alias:

- Rename a column heading
- Is useful with calculations
- Immediately follows the column name
- Required double quotation marks if it contains spaces or special characters, or if it is case-sensitive

Try this:

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

2. SELECT last_name “Name”, salary*12 “Annual Salary”
   FROM employees;
```

Concatenation Operator

A concatenation operator:

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

Try this:

```
1. SELECT last_name || job_id AS “Employees”
   FROM employees;

2. SELECT last_name || ‘ is a ‘ || job_id AS
   “Employees Details”
   FROM employees;

3. SELECT last_name || ‘: 1 Month salary = ‘ || salary Monthly
   FROM employees;
```

Operator	Description
+	Add
-	Subtract
*	Multiply
/	Divide

Duplicate Rows

- The default display of queries is all rows, including duplicate rows.
- Use the DISTINCT keyword to eliminate duplicate rows in the result.

Try this:

1.
```
SELECT department_id
FROM employees;
```

2.
```
SELECT DISTINCT department_id
FROM employees;
```

Do you notice the difference?

Exercise

Instructions: Save all your statement as a <matric_no>_lab_3_<exercise_no>.sql script.

1. Your first task is to determine the structure of the DEPARTMENTS table and its contents.

2. Determine the structure of the EMPLOYEES table. The HR department wants a query to display the last name, job ID, hire date and employee ID for each employee, with the employee ID appearing first. Provide an alias STARTDATE for the HIRE_DATE column. Save your SQL statement to a file named lab_03_02.sql

3. The HR department wants a query to display all unique job IDs from the EMPLOYEES table. Save your SQL statement to a file named lab_03_03.sql.

4. The HR department wants more descriptive column headings for its report on employees. Copy the statement from lab_03_02.sql, name the column headings EMP #, Employee, Job, and Hire Date, respectively. Save your SQL statement to a file named lab_03_04.sql

5. The HR department has requested a report of all employees and their job IDs. Display the last name concatenated with the job ID (separated by a comma and space) and name the column “Employee and Title”. Save your SQL statement to a file named lab_03_05.sql

6. Create a query to display all the data from EMPLOYEES table. Separate each column output by a comma. Name the column title THE_OUTPUT. Save your SQL statement to a file named lab_03_06.sql