Lab 01: Foundation statements of SQL

Objective(s) :

- List the basic capabilities of SQL select statement
- Execute the basic select statement

1. SELECT Statement

Capabilities of basic Select statement

A SELECT statement retrieves information from the database. You can do the following

- Projection: You can use the projection capability in SQL to choose the column in the table that you want returned by your query. You can choose as few or as many columns of the table as you require.
- Selection: You can use the selection capability in SQL to choose the rows in the table that you want returned by query. You can use various criteria to restrict the rows you want.

Joining: You can use the join capability in SQL to bring together data that is stored in different tables by creating a link between them

Syntax:

```
SELECT <column list>
[FROM <source table(s)>]
```

Example 1

Select * from Emp;

Selects all the employees records from the database and displays its columns.

Example 2

Select FirstName, LastName from Emp;

Selects data of these two columns from the Employees table

Then there are some functions that can be used in select statement syntax is

Syntax:

```
SELECT function(<column list>)
[FROM <source table(s)>]
```

Function are SUM, COUNT, DISTINCT, AVG, MIN and MAX there are many other function that are also available.

Example 3

```
SELECT COUNT(*)
FROM emp;
```

Example 4

```
SELECT COUNT(DISTINCT sal)
FROM emp;
```

The WHERE clause immediately follows the
FROM clause and defines what conditions a record has to meet before it will be shown.

Syntax:

```
SELECT function(<column list>)
[FROM <source table(s)>]
[WHERE]<condition>]
```

Example 5

```
SELECT ename,deptno,sal
FROM emp
WHERE empno = 7369;
```

Writing SQL Statements

Using the following simple rules and guidelines, you can construct valid statements that are both easy to read and easy to edit:

- SQL statements are not case sensitive, unless indicated.
- SQL statements can be entered on one or many lines.
- Keywords cannot be split across lines or abbreviated.
- Clauses are usually placed on separate lines for readability and ease of editing.
- Indents should be used to make code more readable.
- Keywords typically are entered in uppercase; all other words, such as table names and columns, are entered in lowercase.

Arithmetic Expressions

You may need to modify the way in which data is displayed, perform calculations, or look at what-if scenarios. These are all possible using arithmetic expressions. An arithmetic expression can contain column names, constant numeric values, and the arithmetic operators.

Arithmetic Operators

The table below lists the arithmetic operators available in SQL. You can use arithmetic operators in any clause of a SQL statement except in the FROM clause.

Operator	Description
+	Add
-	Subtract
*	Multiply
/	Divide

Execute the following query and check the results

SELECT last_name, salary, salary + 300
FROM employees;

Operator Precedence

If an arithmetic expression contains more than one operator, multiplication and division are evaluated first. If operators within an expression are of same priority, then evaluation is done from left to right.
You can use parentheses to force the expression within parentheses to be evaluated first.

Execute the following query and check the results

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

The example above displays the last name, salary, and annual compensation of employees. It calculates the annual compensation as 12 multiplied by the monthly salary, plus a one-time bonus of $100. Notice that multiplication is performed before addition.

Note: Use parentheses to reinforce the standard order of precedence and to improve clarity. For example, the expression on the slide can be written as `(12*salary)+100` with no change in the result.

Using Parentheses

Execute the following query and check the results

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

You can override the rules of precedence by using parentheses to specify the order in which operators are executed.

The example above displays the last name, salary, and annual compensation of employees. It calculates the annual compensation as monthly salary plus a monthly bonus of $100, multiplied by 12. Because of the parentheses, addition takes priority over multiplication.

Exercises

1. Get empno,ename,sal,deptno from emp table.
2. Count total number of employees.
3. Get the highest and the lowest salary from emp table.
4. Calculate net salaries of employee (by adding salary and comm).
5. Display all the deptno that employees belong to, but don't allow repetition.
6. Display data of all employees who work as Salesman.
7. Display names of employees who work in deptno 20.
8. Calculate one year salary of every employee from emp table.
9. Display the total count of departments from dept table.
10. Display the employee name whose salary is more than 2000 but less than 3500.
11. Display all employee names and their manager number from emp table.
12. Show the average salary of all employees.
13. Show the total salary of all employees.