Experiment No. : 3

Title: Write a program to use DML statements to insert, delete, update and display records of the tables.

Objectives:

1. To learn SQL Data Manipulation Language (DML) statement- insert, delete, select and update

Key Concepts: Data Manipulation Language (DML), Java Database Connectivity (JDBC), SQL.

Theory:

Structured Query Language (SQL) is a common query language through which we can interact with the database. SQL Statements can be divided into four main categories

1. **Data definition Language (DDL) Statements -** used to define the database structure or schema.
2. **Data manipulation Language (DML) Statements -** used for managing data within schema objects
3. **Data Control Language (DCL) statements –** used for Security and authorization
4. **Transaction Control (TCL) statements** - used to manage the changes made by DML statements. It allows statements to be grouped together into logical transactions.

Data Manipulation Language (DML) Statements:

- **INSERT -** to add new rows to a table
- **SELECT** – to retrieve data from a table
- **UPDATE** - to change column values of existing rows
- **DELETE** - to remove rows from a table

INSERT:

New records can be added to a table by using this statement. While inserting the data referential integrity has to be considered.

Insert values for All Attributes-

Syntax:

INSERT INTO <table name> VALUES (<Value for Column1>, <Value for Column 2>,…);

Example:

INSERT INTO departments VALUES (280, 'Recreation', 121, 1700);

Insert values for some attributes only-

Syntax:

INSERT INTO <table name> (<column1_name>, <column2_name>, …) VALUES (<Value for Column1>, <Value for Column 2>,…);

Example:

INSERT INTO employees (employee_id, last_name, first_name, email, salary) VALUES (207, 'Gregory', 'pgregory', 'pgregory@oracle.com', 500000);

Use of Select in Insert

Syntax:

INSERT INTO <table name> <SELECT query);

Example:

INSERT INTO bonuses SELECT employee_id, salary*1.1 FROM employees WHERE commission_pct > 0.25;

UPDATE:

Existing data in table can be modified by using update command.

Syntax:

UPDATE <table_name>

SET <column1>=<value1>, <column2>=<value2>,...

WHERE <condition>

Example:

UPDATE Persons

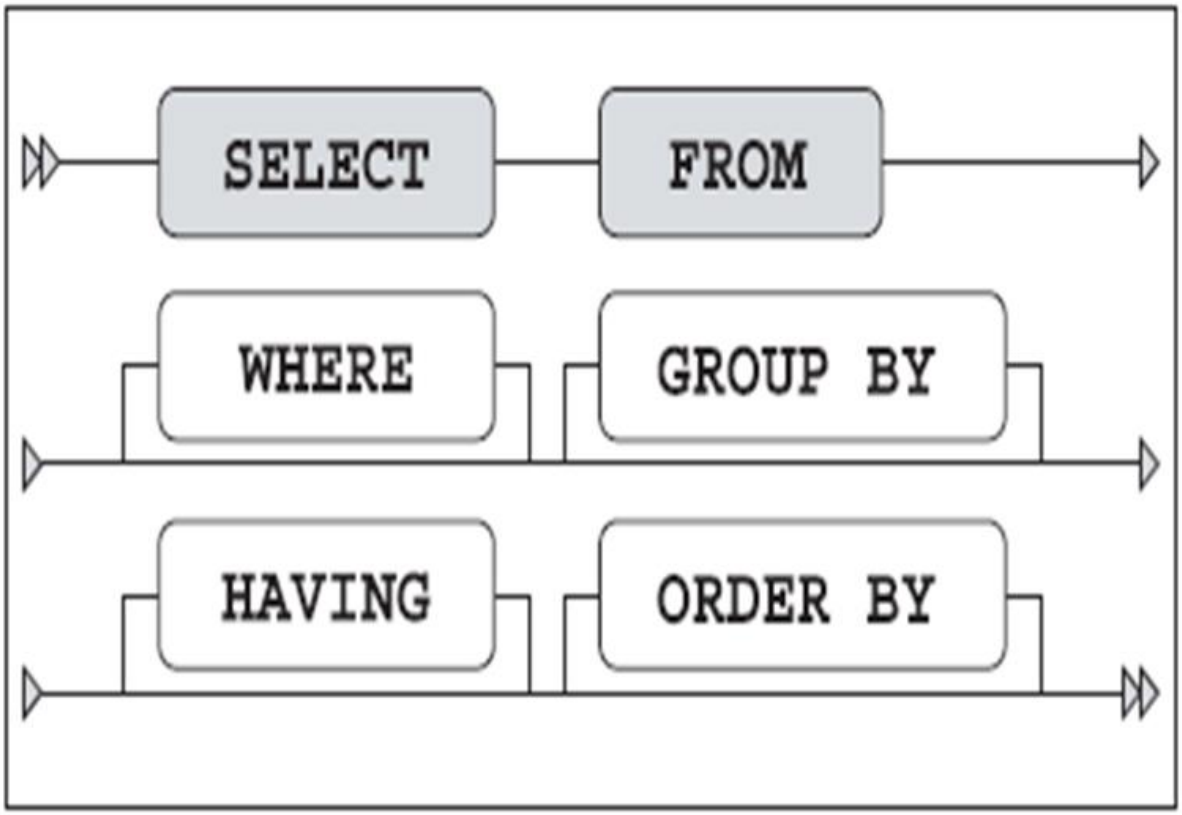
SET Address='Nissestien 67', City='Sandnes'

WHERE LastName='Tjessem' AND FirstName='Jakob'

SELECT:

Data in a table can be retrieved by using select statement. Select statement can be used to retrieve data from one or more tables at a time by giving some conditions.

Syntax:



Component	Description
FROM	Which table(s) is (are) needed for retrieval?
WHERE	What is the condition to filter the rows?
GROUP BY	How should the rows be grouped/aggregated?
HAVING	What is the condition to filter the aggregated groups?
SELECT	Which columns do you want to see in the result?
ORDER BY	In which order do you want to see the resulting rows?

Selecting whole record

Syntax:

SELECT * FROM <name of table> WHERE <condition>

Example:

SELECT * FROM employees;

Selecting some attributes of a record

Syntax:

SELECT <column1 name>, <column2 name>… from <name of table> WHERE <condition>

Example:

SELECT FIRST_NAME, LAST_NAME, DEPARTMENT_ID FROM EMPLOYEES;

Displaying Selected Columns under New Headings

Syntax:

SELECT <column1 name> <Heading1>, <column2 name> <Heading2>, …FROM <name of table> WHERE <condition>

Example:

SELECT FIRST_NAME First, LAST_NAME last, DEPARTMENT_ID Dept FROM EMPLOYEES;

Example - Select statement using IN

SELECT FIRST_NAME, LAST_NAME, DEPARTMENT_ID FROM EMPLOYEES WHERE DEPARTMENT_ID **IN** (100, 110, 120);

Example - Select statement using LIKE

SELECT FIRST_NAME, LAST_NAME FROM EMPLOYEES WHERE LAST_NAME **LIKE** '%Ma%';

Example - Selecting Data that Satisfies Two Conditions

SELECT FIRST_NAME, LAST_NAME, SALARY, COMMISSION_PCT "%" FROM EMPLOYEES WHERE (SALARY >= 11000) **AND** (COMMISSION_PCT IS NOT NULL);

DELETE:

Existing data in table can be deleted by using delete command.

Syntax:

DELETE FROM <table_name> WHERE <condition>

Example – Delete all rows

DELETE FROM Persons;

Example – Delete only specific rows

DELETE FROM Persons WHERE Person_ID=11;

Algorithm:

1. Start
2. Create Java to Oracle database connectivity using JDBC and Oracle drivers.
3. Get information to insert/ delete/ update/ select in a table.
4. Write SQL query to perform specific operations on table.
5. Execute SQL query through java program.
6. Stop.