DML – SELECT Command (Detailed Notes)

1. What is SELECT?

The **SELECT** command is used to **retrieve (fetch) data** from one or more tables.

- It does **not change data**
- It is used for **analysis, reporting, and querying**
- Most frequently used SQL command
- Works with filters, sorting, and grouping

2. Basic SELECT Syntax

2.1 Select all columns

```
SELECT * FROM table_name;
```

2.2 Select specific columns

```
SELECT column1, column2
FROM table_name;
```

3. Example Table

STUDENTS

```
---------------------------------
id | name   | age | city
---------------------------------
1  | Riya   | 21  | Surat
2  | Aman   | 19  | Delhi
3  | Neha   | 22  | Pune
4  | Rahul  | 20  | Mumbai
---------------------------------
```

4. SELECT with WHERE (Filtering Data)

4.1 Basic WHERE condition

```
SELECT * FROM students
WHERE city = 'Delhi';
```

✔ Retrieves only students from Delhi

4.2 Using comparison operators

```
SELECT name, age
FROM students
WHERE age > 20;
```

✔ Shows students older than 20

5. SELECT with AND / OR

5.1 AND condition

```
SELECT * FROM students
WHERE age > 20 AND city = 'Pune';
```

5.2 OR condition

```
SELECT * FROM students
WHERE city = 'Delhi' OR city = 'Mumbai';
```

6. SELECT with ORDER BY (Sorting)

6.1 Ascending order (default)

```
SELECT * FROM students
ORDER BY age;
```

6.2 Descending order

```
SELECT * FROM students
ORDER BY age DESC;
```

7. SELECT with DISTINCT

Used to remove **duplicate values**.

```
SELECT DISTINCT city
FROM students;
```

✔ Displays each city only onc

8. SELECT with Aggregate Functions

Function	Purpose
COUNT()	Total rows

Function	Purpose
SUM()	Total value
AVG()	Average
MAX()	Maximum
MIN()	Minimum

Example:

SELECT COUNT(*) FROM students;

9. SELECT with GROUP BY

SELECT city, COUNT(*)

FROM students

GROUP BY city;

✔ Groups students by city

10. SELECT with HAVING

Used to filter **groups**, not rows.

SELECT city, COUNT(*)

FROM students

GROUP BY city

HAVING COUNT(*) > 1;

11. SELECT with LIKE (Pattern Matching)

SELECT * FROM students

WHERE name LIKE 'R%';

✔ Names starting with R

12. SELECT with IN

SELECT * FROM students

WHERE city IN ('Delhi', 'Mumbai');

13. Important Rules of SELECT

- SELECT does not modify data

- WHERE filters rows
- GROUP BY groups rows
- HAVING filters groups
- ORDER BY sorts results

14. Real-World Use Cases

- Generating reports
- Data analysis
- Dashboards (Power BI, Tableau)
- Searching records

Practice Questions – SELECT Command

Practice Set 1: Basic

1. Display all student records.
2. Display only name and city columns.
3. Show students older than 20.

Practice Set 2: Intermediate

4. Display students from Mumbai and Pune.
5. Sort students by age in descending order.
6. Show unique cities.

Practice Set 3: Advanced

7. Count number of students in each city.
8. Show cities having more than one student.
9. Find the average age of students.

Mini Challenge 🧠

Table:

EMPLOYEES (emp_id, emp_name, salary, department)

Tasks:

1. Display all employees.
2. Show employees from IT department.

3. Find the highest salary.
4. Count employees department-wise.