MYSQL NOTES

DDL Notes

DDL - (Data Definition Language) commands are used to define, modify, and delete database structures.

DDL Commands Summary:

- **CREATE:** Used to create database objects like tables.
- **ALTER:** Used to modify table structure (add/modify/drop columns).
- **DROP:** Deletes database objects permanently.
- **TRUNCATE:** Deletes all records but keeps table structure.
- **RENAME:** Renames a table.
- **COMMENT:** Adds comments to database objects.

Examples:

```
CREATE TABLE Students (id INT PRIMARY KEY, name
    VARCHAR(50), age INT);

ALTER TABLE Students ADD city VARCHAR(30);

DROP TABLE Students;

TRUNCATE TABLE Students;

RENAME TABLE Students TO StudentInfo;
```

DML NOTES

DML (Data Manipulation Language) commands are used to insert, update, delete, and manipulate data in a database.

DML Commands Summary:

• **INSERT:** Used to insert new records into a table.

• **UPDATE:** Used to modify existing records in a table.

• **DELETE:** Used to delete existing records from a table.

Examples:

```
INSERT INTO Students (id, name, age) VALUES (1, 'John', 22);

UPDATE Students SET age = 23 WHERE id = 1;

DELETE FROM Students
```

DQL NOTES

DQL (Data Query Language) is used to retrieve data from the database using the SELECT command.

DQL Command:

SELECT — Used to fetch data from database tables.

Syntax:

SELECT * FROM table_name;

SELECT column1, column2 FROM table_name;

SELECT * FROM table_name WHERE condition;

SELECT * FROM table_name ORDER BY column;

SELECT COUNT(*), MAX(col), MIN(col) FROM table_name;

Examples:

SELECT * FROM Students;

SELECT name, age FROM Students;

SELECT * FROM Students WHERE age > 18;

SELECT COUNT(*) FROM Students;

SELECT name FROM Students ORDER BY age DESC WHERE id = 1;

1. Aggregate Functions

Used with SELECT (often with GROUP BY)

Function	Description
COUNT(*)	Counts rows
COUNT(col)	Counts non-NULL values
SUM(col)	Sum of values
AVG(col)	Average
MAX(col)	Maximum value
MIN(col)	Minimum value
GROUP_CONCAT(col)	Combines multiple values into one string

2. String Functions

Function	Purpose
UPPER(str) / UCASE(str)	Convert to uppercase
LOWER(str) / LCASE(str)	Convert to lowercase
LENGTH(str)	String length
TRIM(str)	Remove spaces
LTRIM(str)	Trim left spaces
RTRIM(str)	Trim right spaces
SUBSTRING(str, start, len)	Extract part of string
CONCAT(str1, str2)	Join strings
REPLACE(str, from, to)	Replace text
LEFT(str, n)	Left substring
RIGHT(str, n)	Right substring

Function	Purpose
INSTR(str, sub)	Position of substring
REVERSE(str)	Reverse string

3. Numeric / Math Functions

Function	Description
ABS(x)	Absolute value
ROUND(x)	Round value
ROUND(x, n)	Round to n decimals
CEIL(x)	Next highest integer
FLOOR(x)	Lowest integer
POWER(x,y)	x^y
SQRT(x)	Square root
MOD(x,y)	Remainder
RAND()	Random number

4. Date & Time Functions

Function	Purpose
NOW()	Current date & time
CURDATE()	Current date
CURTIME()	Current time
DATE(col)	Extract date
TIME(col)	Extract time
YEAR(col)	Extract year

Function	Purpose
MONTH(col)	Extract month
DAY(col) / DAYOFMONTH(col)	Extract day
HOUR(col)	Extract hour
DATE_ADD(date, INTERVAL x unit)	Add time
DATE_SUB(date, INTERVAL x unit)	Subtract time
DATEDIFF(date1, date2)	Difference in days

5. Conditional Functions

Function	**Description**
IF(condition, true, false)	**Conditional value**
IFNULL(expr, value)	**Replace NULL**
NULLIF(expr1, expr2)	**Return NULL if values match**
CASE WHEN THEN	**Multiple conditions (SQL IF-ELSE)**

6. Other Useful SELECT Keywords

Keyword	**Purpose**		**Keyword**	**Purpose**
DISTINCT	**Remove duplicates**		**HAVING**	**Filter after group**
ORDER BY	**Sorting**		**LIMIT**	**Return limited records**