**SQL Commands**

**Q1. What are the different Languages/categories of SQL Commands?**

Ans:- Different Languages of SQL (Structural Query Language) Commands:

1. DDL – Data Definition Language **(Create, Drop, Alter, Truncate)**
2. DQL – Data Query Language **(Select)**
3. DML – Data Manipulation Language **(Insert, Update, Delete)**
4. DCL – Data Control Language **(Grant, Revoke)**
5. TCL – Transaction Control Language **(Commit, Savepoint, Rollback)**

**Q2. What are the different SQL Datatypes?**

Ans:-

|  |  |
| --- | --- |
| Datatype | Properties |
| Numeric | These are used to store numeric values. Examples include INT, BIGINT, DECIMAL, and FLOAT. |
| Character | These are used to store character strings. Examples include CHAR, VARCHAR, and TEXT. |
| Date and Time | These are used to store date and time values. Examples include DATE TIME, and TIMESTAMP |
| Binary | These are used to store binary data, such as images or audio files. Examples include BLOB and BYTEA. |
| Boolean | This data type is used to store logical values. The only possible values are TRUE and FALSE. |
| Interval | These are used to store intervals of time. Examples include INTERVAL YEAR, INTERVAL MONTH, and INTERVAL DAY. |
| Array | These are used to store arrays of values. Examples include ARRAY and JSON. |

**Q3. DDL – Data Definition Language (Create, Drop, Alter, Truncate)?**

Ans:-

1. **CREATE TABLE** statement is used to create table in a database. If you want to create a table, you should name the table and define its column and each column's data type.

**Syntax**: CREATE TABLE <tablename> ("column1" "data type", "column2" "data type", "column3" "data type", ... ,"columnN" "data type");

**Example**:- CREATE TABLE STUDENTS (Id INT NOT NULL, Name VARCHAR (20) NOT NULL, Age INT NOT NULL, Address CHAR (25), PRIMARY KEY (Id));

1. **DROP TABLE** statement is used to delete a table definition and all data from a table. This is very important to know that once a table is deleted all the information available in the table is lost forever, so we have to be very careful when using this command.

**Syntax:-** DROP TABLE <table\_name>;

1. **ALTER TABLE** statement allows you to add, modify, and delete columns of an existing table. This statement also allows database users to add and remove various SQL constraints on the existing tables.

**Syntax:-** ALTER TABLE <table\_name> ADD (column\_Name1 column-definition, column\_Name2 column-definition, .....,column\_NameN column-definition);

**Example:-** ALTER TABLE Employee ADD (Emp\_ContactNo NUMBER(13), Emp\_EmailID VARCHAR(50));

1. **TRUNCATE TABLE** statement is used to remove all rows (complete data) from a table. It is similar to the DELETE statement with no WHERE clause.

* Truncate table is faster and uses lesser resources than DELETE TABLE command. TRUNCATE TABLE doesn't delete the structure of the table.
* The rollback process is not possible after truncate table statement. Once you truncate a table you cannot use a flashback table statement to retrieve the content of the table.

**Syntax:-** TRUNCATE TABLE <table\_name>;

**Example:**- TRUNCATE TABLE Employee;

**Q4. DQL – Data Query Language (Select)**

**Ans:- SELECT** Statement – It is used to access the records from one or more database tables and views. It also retrieves the selected data that follow the conditions we want.

**Syntax:** SELECT Column\_Name\_1, Column\_Name\_2, ....., Column\_Name\_N FROM <Table\_Name> [WHERE Condition | GROUP BY columnName] [HAVING Condition];

**Example:-** SELECT \* FROM table\_name;

SELECT \* FROM Employee\_Details WHERE Emp\_Panelty = 500;

SELECT COUNT (Car\_Name), Car\_Price FROM Cars\_Details GROUP BY Car\_Price;

SELECT SUM (Employee\_Salary), Employee\_City FROM Employee\_Having GROUP BY Employee\_City HAVING SUM(Employee\_Salary)>5000;

SELECT \* FROM Employee\_Order ORDER BY Emp\_Salary DESC;

**Q5. DML – Data Manipulation Language (Insert, Update, Delete)**

**Ans:- CRUD -** CREATE, READ / SELECT, UPDATE, DELETE commands

1. **INSERT** statement It is used to insert a single or a multiple records in a table.

**Syntax**:-INSERT INTO <table\_name> (column1, column2, column3....) VALUES (value1, value2, value3.....);

**Example**:- INSERT INTO Students (ROLL\_NO, NAME, AGE, CITY) VALUES (2, ALKA, 20, GHAZIABAD);

* A single query to insert multiple records in the student table

**Example:-** INSERT INTO ItemTbl (ID, Item\_Name, Item\_Quantity, Item\_Price, Purchase\_Date) VALUES (1, "Soap", 5, 200, "2021-07-08"), (2, "Toothpaste", 2, 80, "2021-07-10"), (3, "Pen", 10, 50, "2021-07-12"));

1. **UPDATE** statement is used to change the data of the records held by tables. Which rows is to be update; it is decided by a condition. To specify condition, we use WHERE clause

**Syntax:-** UPDATE <table\_name> SET [column\_name1= value1,... column\_nameN = valueN] [WHERE condition]

**Example:-** UPDATE students SET User\_Name = 'beinghuman' WHERE Student\_Id = '3';

UPDATE students SET User\_Name = 'beserious', First\_Name = 'Johnny' WHERE Student\_Id = '3';

1. **DELETE** statement is used to delete rows from a table. Generally DELETE statement removes one or more records from a table.

**Syntax:-** DELETE FROM <table\_name> [WHERE condition];

**Example:-** DELETE FROM Employee;

**Q6. DCL – Data Control Language (Grant, Revoke)**

Ans:-

**Q7. TCL – Transaction Control Language (Commit, Rollback)**

Ans:- All the commands that are executed consecutively, treated as a single unit of work and termed as a transaction. To start our transaction by using the BEGIN / START TRANSACTION command.

**Syntax**: START TRANSACTION;

* **COMMIT:** If you want to save all the commands which are executed in a transaction, then just after completing the transaction, you have to execute the commit command. This command will save all the commands which are executed on a table.

**Syntax**: COMMIT;

* **ROLLBACK:** The rollback command is used to get back to the previous permanent status of the table, which is saved by the commit command.
* **Syntax**: ROLLBACK;

**Q8. Difference between TRUNCATE and DELETE and DROP?**

Ans:-

|  |  |  |
| --- | --- | --- |
| **DELETE** | **TRUNCATE** | **DROP** |
| It is a Data Manipulation Language Command (DML) | It is a Data Definition Language Command (DDL) | It is a Data Definition Language Command (DDL) |
| It is used to delete one or more tuples/rows of a table. | It is used to delete all the rows of a table in one go. But we cannot delete single row using truncate. | It is used to drop the whole table. we can drop (delete) the whole structure in one go |
| If we want to delete the row of the table as per the condition then we use the WHERE clause, | With the help of the “TRUNCATE” command, we can’t delete the single row as here WHERE clause is not used. | By using this command the existence of the whole table is finished or say lost. |
| Here we can use the “ROLLBACK” command to restore the tuple because it does not auto-commit. | Here we can’t restore the tuples of the table by using the “ROLLBACK” command. | Here we can’t restore the table by using the “ROLLBACK” command because it auto commits. |

**Q9. What are the different Aggregate Functions?**

Ans:- An SQL aggregate function calculates on a set of values and returns a single value.

The following are the commonly used SQL aggregate functions:

1. **AVG()**: This function will return the average of all values present in a column. Returns the average of set.

**Syntax**: SELECT AVG(column\_name) FROM table\_name WHERE condition;

**Example**: SELECT AVG(Price) FROM sales;

SELECT AVG(Price) FROM sales WHERE Product\_name = 'Mobile';

1. **COUNT():** This function returns the no. of records (rows) in a table. Returns the number of items in a set.

**Syntax:** SELECT COUNT(column\_name) FROM table\_name WHERE condition;

**Example:** select COUNT(\*) FROM Student;

select COUNT(\*) FROM Student WHERE Department = 'CSE';

1. **MAX():** The MAX function in SQL is used to return the highest value in a column for a group of rows that satisfy a given condition in a table. Returns the maximum value in set.

**Syntax**: SELECT MAX(column\_name) FROM table\_name WHERE condition;

**Example**: select MAX(salary) FROM employees;

SELECT MIN(salary) FROM employees WHERE department = 'R&D';

1. **MIN()**: This function produces the lowest value in a column for a group of rows that satisfy a given criterion. Returns the minimum value in a set.

**Syntax**: SELECT MIN(column\_name) FROM table\_name WHERE condition;

**Example**: SELECT MIN(salary) FROM employees;

SELECT MIN(salary) FROM employees WHERE department = 'R&D';

1. **SUM()**: This function returns the sum of all values of a column in a table. Returns the sum of all or distinct values in a set

**Syntax**: SELECT SUM(column\_name) FROM table\_name WHERE condition;

**Example**: select SUM(Price) FROM sales;

select SUM(price) FROM sales WHERE Product\_name = 'Mobile';

* You can use aggregate functions as expressions only in the following:

**SELECT** statement, either a subquery or an outer query.

A **HAVING** clause

**Q10. What are different SQL Clauses?**

Ans:- WHERE, GROUP BY, HAVING, ORDER BY

<https://www.javatpoint.com/sql-clauses>

**Q11. Constraints**

Ans:- PRIMARY KEY, FOREIGN KEY, UNIQUE, NOT NULL

**Q12. Different Operators in SQL:**

Ans:-

1. Comparison Operator: =, <>, <, <=, >, >=, !=
2. Logical Operator: AND, OR, NOT, IS NULL, LIKE, BETWEEN, IN, EXISTS
3. SET Operator: UNION, UNION ALL, INTERSECT, MINUS
4. DISTINCT

**Q13. Joins**

Ans:- INNER JOIN, OUTER JOIN, LEFT JOIN, RIGHT JOIN, CROSS JOIN, FULL JOIN

**Q14. ACID property**

Ans:- ACID stands for Atomicity, Consistency, Isolation and Durability