SQL Introduction

1. SQL stands for Structured Query language.
2. SQL is a standard language for accessing and manipulating databases.

~~MySQL is a RDMS developed by Oracle that is based on SQL~~

→ SQL can execute queries against a database.
→ SQL can retrieve data from a database.
→ SQL can insert records in a database.
→ SQL can update records in a database.
→ SQL can delete records from a database.
→ SQL can create new databases.
→ SQL can create new tables in a database.
∴ ~~Normalization~~

★ DBMS & RDBMS.

DBMS	RDBMS
1. DBMS stands for Database management systems.	RDBMS stands for Relational Database Management System.
2. In DBMS Data are stored in a file.	In RDBMS Data are stored in a Tabular form.
3. Normalization is not available in DBMS. (Data store in normal form.)	Normalization is Available in RDBMS.
4. It allow one user at a time.	It allow more than one user at a time.
5. Hierarchial Arrangement of Data. (Tree form (Parent-child relationship))	Stores Data in the form of Rows and Column.
6. It Does not Support ACID Property.	It Support ACID Property.
7. It Does not Support Client Server Architecture	It Support Client Server Architecture.

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1. Create Table

CREATE TABLE statement is used to Create a new table in a database. You should specify the name and data types of each column.

```
CREATE TABLE table_name(
Column1 datatype,
Column2 datatype,
Column3 datatype
);
```

→ Format.

Ex→
```
CREATE TABLE Daya
(
P_ID int,
firstname varchar(255),
lastname varchar(255),
Address varchar(255),
City varchar(255)
);
```

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2. Insert Into.

Use of "Insert into" is insert new record in a table

Syntax:

```
Insert Into table_name (Column1, Column2)
Values (Value1, Value2, value3)
```

Ex: Insert Into table_name (P_ID, First name, lastname)
Values (1, 'Lokesh', 'Yadav');

3. AND & OR Operator

→ AND Operator displays a record if both the first and second condition is true.
→ OR Operator displays a record if either the first or the second condition is true.

Syntax:

AND

```
Select Column1, Colum2, ...
From table-name
Where condition1 AND condition2 AND condition3 ... ;
```

OR

```
Select column1, column2, ...
From table-name
Where condition1 OR condition2 OR condition3 ... ;
```

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4. Where Clause.

Where clause is used to extract only those records that fulfill a specified criteria.

Syntax:

```
Select column_name from
table_name where column_name
operator value;
```

5. Order By

Order by keyword is used to sort the result set by a specified column.

→ The Order by keyword sort the records in ascending order by default.

→ but in descending order, you can use "DESC" keyword.

Syntax:

```
Select column_name from table_name order by column_name
ASC | DESC.
```

Note: No, give any input (Asc | Desc), So. data are ascending by default.

6. Distinct Statement

In a table, some of the Columns may constains duplicate values. This is Not a problem, some time you will want to list only the different values in a table.

Syntax :

```
Select Distinct Column_name
from table_name;
```

7. Delete Statement.

The Delete Statement is used to delete rows in a table.

Note : If you Omit (छोड़ देना / नहीं लिखना) the where clause, all records will be deleted. Be careful when deleting records, You cannot undo this statement.

Syntax :

```
Delete from table_name where
condition;
```

8. Date Time.

Syntax :- Select Now(), Curdate(), Cur time();

∵ Curdate → current date.

∵ Cur time → Current time.

9. Functions.

1. AVG() - Select AVG(column_name) from table_name;
2. Count() - Select Count(column_name) from table_name;
3. LCase() - Select LCase(Column_name) from table_name;
4. Max() - Select Max(Column_name) from table_name;
5. Min() - Select Min(Column_name) from table_name;
6. Sum() - Select Sum(Column_name) from table_name
   Where condition;
7. Round() - Select column_name, Round(Column_name), decimals)
   from table_name;
8. Substring() → it is used to get part of a string.

Select LastName, SubStr(FirstName,1,2) As initial from Persons;

10. UCase() - Select UCase(column_name) from table_name;
10. Replace() - Select Replace(CustomerName, 'Brown', 'Hello')
    from Orders;

Note :- Replace() → Replace function string m "old string" ko "new string" k saath replace krta h.

Ex :- (This is Java Tutorial, "Java", "SQL");

Output :- This is SQL Tutorial.

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10. Group By Statement

Group By Statement is used in conjuction with the aggregate functions to group the result set by one or more columns.

Syntax :- Select column_name(s), From table_name Where condition Group by column_name(s)

11. Having Clause

The Having clause was added to SQL because the Where keyword cannot be used with aggregate functions.

Syntax :- Select Customer, Sum(Order Price) from Orders. Group by Customer Having Sum(Order Price) < 4000.

12. Alter Table Statement

Alter Table statement is used to add, delete, or modify columns in an existing table

→ To add a column in a table → (Alter table table_name ADD column_name datatypes).

→ To delete a column in a table → (Alter Table table_name drop column column_name)

→ To change the data types a column in a table → (Alter Table table_name modify column column_name datatypes).

13. Alias

SQL Alias → You can give a table or a column another name by using an alias.

Select Column_name as alias_name from table_name

14. Drop

SQL Drop Database → The Drop Database statement is used to drop an existing SQL Database.

SQL Drop Table → The Drop Table Statement is used drop an existing table in a Database.

Syntax :

~~Drop Datatypes~~

→ Drop Database Database_name ;

→ Drop Table Table_name ;

15. Between Operator

The Between Operate is used in a Where clause to select a range of data between two values.

Begin and end values are included.

Syntax :

Select * from Products

Where Price between 10 and 20.

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16. In Operator

In Operator allows you to specify multiple values in a Where clause. The number of values in the parenthesis can be one or more with each values separated by comma.

```
Select * from Persons where lastname In ('James',
                                         'Daya' );
```

17. SQL Like Operator

The SQL Like Operator is used in a where clause to search for a specified pattern in a column.

→ Like 'a%' → Find any values that starts with "a"
→ Like '%a' → Find any values that ends with "a"
→ Like '%sh%' → Find any values that have "sh" in any position.
→ Like '_r%' → Find any values that ~~starts with~~ have "r" in the second position
→ Like 'a_%' → Find any values that start with "a" and are at least 2 characters in length.
→ Like 'a__%' → Find any values that start with "a" and are at least 3 characters in length.
→ Like 'a%o' → Find any values that start with "a" and ends with "o".

18. Truncate Command

The SQL Truncate Table command is used to delete complete data from an existing table.

```
Truncate Table table_name;
```

Note: Table m jitna bhi data H usko delete kr dega.

19. Update Command

The Update statement is used to update records in a table.

Syntax:

```
Update table_name
Set column1 = value1, column2 = value2, ...
Where condition;
```

Ex:

```
Update Customers
Set Contact name = 'Juan'
Where Country = 'Mexico';
```

20. Constraint

SQL Constraints are used to specify rules for the data in a table.

→ Not Null → Ensures that a column cannot have a Null value.
→ Unique → Ensures that all values in a columns are different.
→ Primary key → A combination of a Not Null and Unique. Uniquely identifies each row in a table.
→ Foreign Key → Prevents actions that would destroy links between tables.
→ Check → Ensures that the values in a column satisfies a specific condition.
→ Default → Sets a default value for a column if no value is specified.

21. Primary key (Unique + Not Null).

→ The primary key constraint uniquely identifies each record in a table.
→ Primary keys must contain Unique values, and cannot contain Null values.
→ A table can have only One primary key.

```
Create Table Persons
(
ID int Not Null,
LastName varchar (255) Not Null,
First name varchar (255),
Age int,
Primary key (ID)
);
```

22. Foreign Key

The Foreign key constraints is used to prevent actions that would destroy links between tables.

A Foreign key is a field (or collection of fields) in a one table, that refers to the Primary key in another table.

The table with the foreign key is called table, and the table with the primary key is called the referenced or parent table.

```
Create Table Orders (
Order ID int Not Null,
Order Number int Not Null,
Person ID int,
Primary key (order ID),
FOReign key (Person ID) References
↳ Persons (Person ID)
);
```

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Note : Primary key

1. A table can have only one primary key (unique + not null).
2. foreign key - to make relationship b/w two or more than two tables.
3. One table contain primary key and other table contain foreign key.
4. A common column in both the tables (common should have same datatypes.
5. Primary key (Parent table) + Foreign key (child table).

⇒ According to table.

Primary key

Primary_id	Primarynumber	location
1.	1234	jaipur
2.	5678	udaipur
3.	9101	vaipur
4.	1121	ajmer

Foreign key.

foreign_id	foreignname	primary_id
10	daya	1
20	minki	2
30	Pooja	3
40	divya	4

foreign key

Primary keys

references kr rha h.

Note : Foreign key Two tables ko aapas m combine krta h.

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23. Join Operation

A Join clause is used to combine rows from two or more tables based on a related column between them.

Inner Join / Join → Return rows that have matching values in both tables.

Left Join → Return all rows from the left table, even if there are no matches in the right table.

Right Join → Return all rows from the Right table, even if there are no matches in the left table.

Full Join → Returns rows when there is a match in one of the tables.

⇒ 1. Join / Inner Join

```
Select table1.column1, table2.column2....
From table1 Inner Join table2 on
  table1.common_field = table2.common_field;
```

Query :- Select orders_2.p_id, persons.firstname, persons.lastname, orders_2.order_no from persons inner join orders_2 on persons.p_id = orders_2.p_id

P_id	firstname	lastname	address	city
1	mridul	Srivastav	Street 15	Khi bhi
2	daya	Saini	arihant	Jaipur
3	gunnu	Saini	moda Pada	Chakchu
4	divya	Sahu	doagah	ajmer

→ Persons

O_id	order_no	P_id
1	1234	3
1	5678	3
1	9101	1
1	1121	1
1	3141	0

→ orders_2

P_id	firstname	lastname	order_no
3	gunnu	Saini	1234
3	gunnu	Saini	5678
1	mridul	Srivastav	9101
1	mridul	Srivastav	1121

⇒ Result.

⇒ 2. Left Join

Query → Select persons.firstname, persons.lastname, orders_2.order_no, orders_2.P_id from persons left Join orders_2 on persons.P_id = orders_2.P_id;

P_id	firstname	lastname	address	city
1	mridul	Srivastav	Street 15	khibhi
2	daya	Saini	vaishant	Jaipur
3	gunnu	Saini	moda Pada	Chakan
4	divya	Sahu	dargah	ajmer

⇓ Persons

O_id	order_no	P_id
1	1234	3
1	5678	3
1	9101	1
1	1121	1
1	3141	0

⇒ orders-2

firstname	lastname	order_no	P_id
mridul	Srivastav	1121	1
mridul	Srivastav	9101	1
daya	Saini	Null	Null
gunnu	Saini	5678	3
gunnu	Saini	1234	3
divya	Sahu	Null	Null

⇓ Result.

3. Right Join

Query : Select persons.firstname, persons.lastname, orders_2.order_no, orders_2.P_id from persons right Join orders_2 on persons.P_id = orders_2.P_id ;

P_id	firstname	lastname	address	city
1	mridul	Srivastav.	Street 15	khi bhi
2	daya	Saini	agrihont	Jaipur
3	gunnu	Saini	moda Pada	chaksu
4	divya	Sahu	dungah	ajmer

⇒ Persons

O_id	order_no	P_id
1	1234	3
1	5678	3
1	9101	1
1	1121	1
1	3141	0

⇒ orders_2

firstname	lastname	order_no	P_id
gunnu	Saini	1234	3
gunnu	Saini	5678	3
mridul	Srivastav	9101	1
mridul	Srivastav	1121	1
Null	Null	3141	0

⇒ Result.

24. Increment

Auto Increment allows a unique number to be generated when a new record is inserted into a table.

Syntax:
```
Create Table Person(
Person_id Not Null Auto_increment,
LastName Varchar (255) Not Null,
FirstName Varchar (255),
Age int,
Primary key (Person id)
);
```

Note: Inter auto increment use karne se automatically value de dega & usko increment karta jayega.

25. Top Clause

Top clause is used to specify the number of records to return.

Syntax:
```
Select * from persons limit 5;
```

Note: limit 5 → tha pr limit 5 liya H.

SQL Command / Type of SQL Statements.

DDL → Data Definition language
DQL → Data Query language
DML → Data Manipulation language
DCL → Data Control language
TCL → Transaction Control language.

* ⇒ Inke andar kya kya aata H.

DDL - Create, Drop, Alter, Truncate
DML - Insert, Delete, Update
DQL - Select
TCL - Commit, Savepoint, Rollback.
DCL - Grant, Revoke