**What is the difference between SQL and MySQL?**

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| --- | --- |
| **SQL** | **MySQL** |
| SQL is a standard language which stands for Structured Query Language based on the English language | MySQL is a database management system. |
| SQL is the core of the relational database which is used for accessing and managing database | MySQL is an RDMS (Relational Database Management System) such as SQL Server, Informix etc. |

### ****What are the different subsets of SQL?****

### Data Definition Language (DDL) – It allows you to perform various operations on the database such as CREATE, ALTER, and DELETE objects.

### Data Manipulation Language(DML) – It allows you to access and manipulate data. It helps you to insert, update, delete and retrieve data from the database.

### Data Control Language(DCL) – It allows you to control access to the database. Example – Grant, Revoke access permissions.

**What do you mean by DBMS? What are its different types?**

A [**Database Management System**](https://www.edureka.co/blog/dbms-tutorial/) (**DBMS**) is a  software application that interacts with the user, applications, and the database itself to capture and analyze data. A database is a structured collection of data.

A DBMS allows a user to interact with the database. The data stored in the database can be modified, retrieved and deleted and can be of any type like strings, numbers, images, etc.

There are two types of DBMS:

*Relational Database Management System*: The data is stored in relations (tables). Example – MySQL.

*Non-Relational Database Management System*: There is no concept of relations, tuples and attributes.  Example – MongoDB

## **Different Types of SQL JOINs**

Here are the different types of the JOINs in SQL:

* (INNER) JOIN: Returns records that have matching values in both tables
* LEFT (OUTER) JOIN: Returns all records from the left table, and the matched records from the right table
* RIGHT (OUTER) JOIN: Returns all records from the right table, and the matched records from the left table
* FULL (OUTER) JOIN: Returns all records when there is a match in either left or right table

      

### What are some common clauses used with SELECT query in SQL?

The following are some frequent SQL clauses used in conjunction with a SELECT query:

**WHERE** clause: In SQL, the WHERE clause is used to filter records that are required depending on certain criteria.  
**ORDER BY** clause: The ORDER BY clause in SQL is used to sort data in ascending (ASC) or descending (DESC) order depending on specified field(s) (DESC).  
**GROUP BY** clause: GROUP BY clause in SQL is used to group entries with identical data and may be used with aggregation methods to obtain summarised database results.  
**HAVING** clause in SQL is used to filter records in combination with the GROUP BY clause. It is different from WHERE, since the WHERE clause cannot filter aggregated records.

### What is Cursor? How to use a Cursor?

After any variable declaration, DECLARE a cursor. A SELECT Statement must always be coupled with the cursor definition.

To start the result set, move the cursor over it. Before obtaining rows from the result set, the OPEN statement must be executed.

To retrieve and go to the next row in the result set, use the FETCH command.

To disable the cursor, use the CLOSE command.

Finally, use the DEALLOCATE command to remove the cursor definition and free up the resources connected with it.

**What is BLOB and TEXT in MySQL?**

TEXT and CHAR will convert to/from the character set they have associated with time. BLOB and BINARY simply store bytes.

BLOB is used for storing binary data while Text is used to store large string.

BLOB values are treated as binary strings (byte strings). They have no character set, and sorting and comparison are based on the numeric values of the bytes in column values.

TEXT values are treated as nonbinary strings (character strings). They have a character set, and values are sorted and compared based on the collation of the character set.

**What are Constraints?**

[Constraints in SQL](https://www.edureka.co/blog/sql-constraints/) are used to specify the limit on the data type of the table. It can be specified while creating or altering the table statement. The sample of constraints are:

NOT NULL

CHECK

DEFAULT

UNIQUE

PRIMARY KEY

FOREIGN KEY

**What is the difference between DELETE and TRUNCATE statements?**

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| --- | --- |
| **DELETE** | **TRUNCATE** |
| Delete command is used to delete a row in a table. | Truncate is used to delete all the rows from a table. |
| You can rollback data after using delete statement. | You cannot rollback data. |
| It is a DML command. | It is a DDL command. |
| It is slower than truncate statement. | It is faster. |

**What is the difference between clustered and non-clustered index in SQL?**

The differences between the clustered and non clustered index in SQL are :

Clustered index is used for easy retrieval of data from the database and its faster whereas reading from non clustered index is relatively slower.

Clustered index alters the way records are stored in a database as it sorts out rows by the column which is set to be clustered index whereas in a non clustered index, it does not alter the way it was stored but it creates a separate object within a table which points back to the original table rows after searching.

One table can only have one clustered index whereas it can have many non clustered index.

**What do you understand by query optimization?**

The phase that identifies a plan for evaluation query which has the least estimated cost is known as query optimization.

The advantages of query optimization are as follows:

* The output is provided faster
* A larger number of queries can be executed in less time
* Reduces time and space complexity

**What is Normalization and what are the advantages of it?**

Normalization in SQL is the process of organizing data to avoid duplication and redundancy. Some of the advantages are:

* Better Database organization
* More Tables with smaller rows
* Efficient data access
* Greater Flexibility for Queries
* Quickly find the information
* Easier to implement Security
* Allows easy modification
* Reduction of redundant and duplicate data
* More Compact Database
* Ensure Consistent data after modification

**What is the difference between DROP and TRUNCATE commands?**

DROP command removes a table and it cannot be rolled back from the database whereas TRUNCATE command removes all the rows from the table.

**How many Aggregate functions are available in SQL?**

SQL aggregate functions provide information about a database’s data. AVG, for example, returns the average of a database column’s values.

SQL provides seven (7) aggregate functions, which are given below:

AVG(): returns the average value from specified columns.

COUNT(): returns the number of table rows, including rows with null values.

MAX(): returns the largest value among the group.

MIN(): returns the smallest value among the group.

SUM(): returns the total summed values(non-null) of the specified column.

FIRST(): returns the first value of an expression.

LAST(): returns the last value of an expression.

**What is the ACID property in a database?**

**ACID stands for Atomicity, Consistency, Isolation, Durability.** It is used to ensure that the data transactions are processed reliably in a database system.

**Atomicity**: Atomicity refers to the transactions that are completely done or failed where transaction refers to a single logical operation of a data. It means if one part of any transaction fails, the entire transaction fails and the database state is left unchanged.

**Consistency**: Consistency ensures that the data must meet all the validation rules. In simple words, you can say that your transaction never leaves the database without completing its state.

**Isolation**: The main goal of isolation is concurrency control.

**Durability**: Durability means that if a transaction has been committed, it will occur whatever may come in between such as power loss, crash or any sort of error.

**What do you mean by “Trigger” in SQL?**

Trigger in SQL is are a special type of stored procedures that are defined to execute automatically in place or after data modifications. It allows you to execute a batch of code when an insert, update or any other query is executed against a specific table.

**What is the difference between cross join and natural join?**

The cross join produces the cross product or Cartesian product of two tables whereas the natural join is based on all the columns having the same name and data types in both the tables.

**What is the need for group functions in SQL?**

Group functions work on the set of rows and return one result per group. Some of the commonly used group functions are: AVG, COUNT, MAX, MIN, SUM, VARIANCE.

**What is the main difference between ‘BETWEEN’ and ‘IN’ condition operators?**

BETWEEN operator is used to display rows based on a range of values in a row whereas the IN condition operator is used to check for values contained in a specific set of values.

Example of BETWEEN:

SELECT \* FROM Students where ROLL\_NO BETWEEN 10 AND 50;

Example of IN:

SELECT \* FROM students where ROLL\_NO IN (8,15,25);

**What is the difference between ‘HAVING’ CLAUSE and a ‘WHERE’ CLAUSE?**

HAVING clause can be used only with SELECT statement. It is usually used in a GROUP BY clause and whenever GROUP BY is not used, HAVING behaves like a WHERE clause.

Having Clause is only used with the GROUP BY function in a query whereas WHERE Clause is applied to each row before they are a part of the GROUP BY function in a query.

**What is a View?**

A view is a virtual table which consists of a subset of data contained in a table. Since views are not present, it takes less space to store. View can have data of one or more tables combined and it depends on the relationship.

Let’s move to the next question in this SQL Interview Questions.

**What are Views used for?**

A view refers to a logical snapshot based on a table or another view. It is used for the following reasons:

Restricting access to data.

Making complex queries simple.

Ensuring data independence.

Providing different views of same data.

**What is a Stored Procedure?**

A Stored Procedure is a function which consists of many SQL statements to access the database system. Several SQL statements are consolidated into a stored procedure and execute them whenever and wherever required which saves time and avoid writing code again and again.

**List some advantages and disadvantages of Stored Procedure?**

**Advantages:**

A Stored Procedure can be used as a modular programming which means create once, store and call for several times whenever it is required. This supports faster execution. It also reduces network traffic and provides better security to the data.

**Disadvantage:**

The only disadvantage of Stored Procedure is that it can be executed only in the database and utilizes more memory in the database server.

**Second Highest Salary from Employee**

**select \*from employee group by salary order by salary desc limit 1,1;**

SELECT name, MAX(salary) AS salary FROM employee WHERE salary IN (SELECT salary FROM employee MINUS SELECT MAX(salary) FROM employee);

SELECT name, MAX(salary) AS salary FROM employee WHERE salary <> (SELECT MAX(salary) FROM employee);

**Highest Salary Department wise**

SELECT DEPT\_ID, MAX(SALARY) FROM department GROUP BY DEPT\_ID;

**Write a query to fetch all employees who also hold the managerial position.**

SELECT E.EmpFname, E.EmpLname, P.EmpPosition FROM EmployeeInfo E INNER JOIN EmployeePosition P ON E.EmpID = P.EmpID AND P.EmpPosition IN ('Manager');

**Write a query to fetch the department-wise count of employees sorted by department’s count in ascending order.**

SELECT Department, count(EmpID) AS EmpDeptCount

FROM EmployeeInfo GROUP BY Department

ORDER BY EmpDeptCount ASC;

**Write a SQL query to retrieve employee details from EmployeeInfo table who have a date of joining in the EmployeePosition table.**

SELECT \* FROM EmployeeInfo E WHERE EXISTS (SELECT \* FROM EmployeePosition P WHERE E.EmpId = P.EmpId);

**Write a query to retrieve duplicate records from a table.**

SELECT EmpID, EmpFname, Department COUNT(\*) FROM EmployeeInfo GROUP BY EmpID, EmpFname, Department HAVING COUNT(\*) > 1;