iNeuron

Python

Interview Questions

1. Where do you use the DISTINCT statement?
The DISTINCT condition is accompanied by the SELECT statement to remove all duplicate records and return unique values. It is used to eliminate duplicate results returned from a SELECT statement.

2. What is the MERGE statement used for?

The MERGE statement in SQL is used to perform a combination of INSERT, UPDATE, and DELETE operations on a target table based on the data present in a source table. It is also known as UPSERT operation, which means to update the existing record if it exists, otherwise insert a new record.

3. What is an ALIAS?

An ALIAS command is a name given to a table. It is used with the WHERE statement when users need to identify a particular table. They are often used to increase the readability of the column names. An alias exists only for the time the query exists and is created with the AS keyword.

Alias Syntax for column

SELECT column_name AS alias_name FROM table_name;

Alias syntax for table

SELECT column_name(s) FROM table_name AS alias_name;

4. What does the REPLACE function do?

The REPLACE function is used to replace existing characters in all instances. The function searches the original string, identifies all instances of the substring to be replaced and then replaces them with the specified replacement substring.

5. What is the difference between UNION and UNION ALL? Provide examples.

UNION combines the result of two SELECT statements by removing duplicate records and returning a sorted result set.

UNION ALL also combines the result of two SELECT statements, but it does not remove duplicates and does not sort the result set. It is faster due to less processing overhead.

6. What does STUFF() do?

The STUFF() function deletes a string section and inserts another part into a string starting from a specified position.

Syntax:

STUFF (source_string, start, length, add_string)

Where:-

source_string: This is the original string to be modified.
start: It is the starting index from which the given length of characters are deleted, and a new sequence of characters will be added.
length: The number of characters to be deleted from the starting index in the main string.
add_string: The new set of characters (string) to be inserted in place of deleted characters from the starting index

7. Differentiate between RENAME and ALIAS.

RENAME changes the name of a column or table, while ALIAS gives an additional name to an existing object. RENAME is permanent, whereas ALIAS is a temporary name.

8. How would you optimize a slow-performing SQL query? Discuss key steps and factors to consider.

To optimize a slow-performing SQL query, consider the following steps:

Examine the execution plan, identifying potential bottlenecks.
Use efficient JOIN operations (e.g., INNER JOIN, OUTER JOIN) for quicker results.
Optimize SELECT statement, retrieving only necessary columns.

Use appropriate indexes on frequently searched columns.
Implement pagination, limiting the returned records using OFFSET and FETCH or LIMIT.
Filter data as early as possible with WHERE clauses to reduce the query's scope.
Avoid using subqueries when possible, opting for JOINs or CTEs.
Use aggregate functions and GROUP BY effectively.
Optimize the database schema and normalize tables.

9. What is an Index-Seek operation, and when does the query optimizer choose to perform this operation?

Index-Seek is a faster and more efficient way to search for records in a table. It is used when the query optimizer chooses to navigate the index's B-tree structure directly to find the specific records, rather than scanning the entire table/index. It is performed when an appropriate index exists and the query matches the index conditions (e.g., WHERE clause with indexed columns).

10. What is a deadlock in SQL, and how can you prevent them?

A deadlock occurs when two or more transactions are waiting indefinitely for each other to release resources such as locks on rows or tables. To prevent deadlocks:

Access objects in a consistent order, reducing the chances of cyclic dependencies.
Reduce lock time, ensuring minimal time between acquiring and releasing locks.
Apply appropriate isolation levels to limit the locking scope
Use transactions with a smaller scope and avoid running large, long-running transactions.
Implement a deadlock detection and handling mechanism, such as timeouts or retry logic.

11. What is a live lock?

A live lock is a situation where two or more processes are actively trying to make progress but are blocked and unable to proceed. In live lock, the processes are not blocked on resources but are actively trying to complete the tasks causing them to interfere with each other. It is difficult to detect and resolve Live locks because the system does not crash or give an error message.

12. When do you use COMMIT?

COMMIT is used when a transaction happens, and the changes are permanently recorded in the database. Once you use COMMIT, you can't revert the changes unless you perform another transaction to reverse them.

13. Write a query that shows a non-equi join.

A non-equi join is a method of joining two or more tables without an equal condition. Operators such as <>,!=,<,>,BETWEEN are used. !=,<,>,Between. See below:

14. Write a query showing the use of equi join.

Equi joins two or more tables using the equal sign operator (=).

15. What is the difference between COMMIT and ROLLBACK?

COMMIT is a statement executed to save the changes made to a database. It ensures that the changes made within a transaction are permanent and cannot be rolled back. On the other hand, a ROLLBACK statement is executed to revert all the changes made on the current transaction to the previous state of the database.

16. What is the difference between GETDATE and SYSDATETIME.

GETDATE function returns the date and time of a location. While on the other hand, the SYSDATETIME function returns the date and time with a precision of 7 digits after the decimal point.

17. What is the difference between a temporary table and a table variable in SQL Server?

Temporary Table: A temporary table is created using CREATE TABLE statement with a prefix #, and it is stored in the tempdb system database. Temporary tables support indexing, statistics, and can have constraints. There are two types of temporary tables: local (visible only to the session that created it) and global (accessible to all sessions).

Table Variable: A table variable is declared using DECLARE statement with @ prefix, and it is also stored in the tempdb system database. Table variables don't require explicit dropping, have no statistics, limited constraints, and are scoped to the batch or stored procedure in which they are declared.

18.What is the use of the SET NOCOUNT function?

SET NOCOUNT function is a function that helps to stop the message that indicates how many rows are being affected while executing a T-SQL statement or stored procedure.

19.Define isolation in SQL transactions.

In SQL transactions, isolation refers to the degree to which a transaction is separated from other transactions taking place concurrently within a database management system (DBMS). It is one of the four key properties of database transactions - known as ACID

(Atomicity, Consistency, Isolation, Durability). Isolation levels determine the extent to which changes made by one transaction are visible to other simultaneous transactions, and each level provides different performance and side effects.

20. What is the use of a Graph Database?

The main advantage of using graph databases is their ability to efficiently handle interconnected data, making them suitable for use cases where relationships between entities are deep, complex, or frequently changing. They excel at tasks such as performing complex graph analysis, traversing hierarchical relationships, or finding patterns in connected data.