

SQL Interview Questions & Answers

Q) In what sequence SQL statement are processed?

Ans. The clauses of the select are processed in the following sequence

1. FROM clause
2. WHERE clause
3. GROUP BY clause
4. HAVING clause
5. SELECT clause
6. ORDER BY clause
7. TOP clause

Q) What is Index, cluster index and non cluster index ?

Ans. Clustered Index:- A Clustered index is a special type of index that reorders the way records in the table are physically stored. Therefore table may have only one clustered index. Non-Clustered Index:- A Non-Clustered index is a special type of index in which the logical order of the index does not match the physical stored order of the rows in the disk. The leaf nodes of a non-clustered index does not consists of the data pages. instead the leaf node contains index rows.

Q) Why you need indexing? where that is Stored and what you mean by schema object? For what purpose we are using view?

We can't create an Index on Index.. Index is stored in user_index table. Every object that has been created on Schema is Schema Object like Table, View etc. If we want to share the particular data to various users we have to use the virtual table for the Base table. So that is a view.

Indexing is used for faster search or to retrieve data faster from various table. Schema containing set of tables, basically schema means logical separation of the database. View is created for faster retrieval of data. It's customized virtual table. we can create a single view of multiple tables. Only the drawback is..view needs to be get refreshed for retrieving updated data.

Q) What the difference between UNION and UNIONALL?

Union will remove the duplicate rows from the result set while Union all does'nt.

Q) What are different Types of Join?

1. **Cross Join** A cross join that does not have a WHERE clause produces the Cartesian product of the tables involved in the join. The size of a Cartesian product result set is the number of rows in the first table multiplied by the number of rows in the

second table. The common example is when company wants to combine each product with a pricing table to analyze each product at each price.

2. **Inner Join** A join that displays only the rows that have a match in both joined tables is known as inner Join. This is the default type of join in the Query and View Designer.
3. **Outer Join** A join that includes rows even if they do not have related rows in the joined table is an Outer Join. You can create three different outer join to specify the unmatched rows to be included:
 1. **Left Outer Join:** In Left Outer Join all rows in the first-named table i.e. "left" table, which appears leftmost in the JOIN clause are included. Unmatched rows in the right table do not appear.
 2. **Right Outer Join:** In Right Outer Join all rows in the second-named table i.e. "right" table, which appears rightmost in the JOIN clause are included. Unmatched rows in the left table are not included.
 3. **Full Outer Join:** In Full Outer Join all rows in all joined tables are included, whether they are matched or not.
4. **Self Join** This is a particular case when one table joins to itself, with one or two aliases to avoid confusion. A self join can be of any type, as long as the joined tables are the same. A self join is rather unique in that it involves a relationship with only one table. The common example is when company has a hierarchal reporting structure whereby one member of staff reports to another. Self Join can be Outer Join or Inner Join.

Q) What is Data-Warehousing?

1. **Subject-oriented**, meaning that the data in the database is organized so that all the data elements relating to the same real-world event or object are linked together;
2. **Time-variant**, meaning that the changes to the data in the database are tracked and recorded so that reports can be produced showing changes over time;
3. **Non-volatile**, meaning that data in the database is never over-written or deleted, once committed, the data is static, read-only, but retained for future reporting.
4. **Integrated**, meaning that the database contains data from most or all of an organization's operational applications, and that this data is made consistent.

Q) In what sequence SQL statement are processed?

The clauses of the subselect are processed in the following sequence (DB2): 1. FROM clause 2. WHERE clause 3. GROUP BY clause 4. HAVING clause 5. SELECT clause 6. ORDER BY clause 7. FETCH FIRST clause

Q). Explain UNION, MINUS, UNION ALL, INTERSECT ?

INTERSECT returns all distinct rows selected by both queries.

MINUS – returns all distinct rows selected by the first query but not by the second.

UNION – returns all distinct rows selected by either query

UNION ALL - returns all rows selected by either query, including all duplicates

Q) Tell something about the Temp Table?

Ans: It is basically a structure in the SQL that is used for storing any sort of data that is not permanent or need to be stored for a specific time period. Depending on the needs, it is possible to extend the space up to any extent. Generally, limited space is kept reserved as the temp table.

Q) What are the different types of SQL's statements?

Ans: 1. **DQL** - Data Query Language (or) Data Retrieval Language

- SELECT Statement

2. **DML** –Data Manipulation Language
DML is used for manipulation of the data itself.

- INSERT Statement
- UPDATE Statement
- DELETE Statement

3. **DDL** – Data Definition Language
DDL is used to define the structure that holds the data.

- CREATE Statement
- ALTER Statement
- DROP Statement
- RENAME Statement
- TRUNCATE Statement

4. **DCL** – Data Control Language
DCL is used to control the visibility of data.

- GRANT Statement
- REVOKE Statement

5. **TCL** - Transaction Control Language

- COMMIT Statement
- ROLLBACK Statement
- SAVEPOINT Statement

Q) Difference Between Delete & Truncate?

Ans:

SQL Delete Vs SQL Truncate	
DELETE	TRUNCATE
It is DML Command	It is DDL Command
It is used to delete all the records row by row	It is used to delete all the records at a time
By using delete command we can delete a specific record	By using truncate we cannot delete specific record
Where condition we can use with the delete command	Where condition will not work with truncate
Delete will work slow compare with truncate	Truncate will work fast compare with delete
Delete will not reset auto-generate id. Once when we delete all the records from the table.	Truncate will reset auto-generate id from starting number.

Q) Difference Between Views & Materialized Views?

Ans:

Views	Materialized Views
The view does not store data	Materialized view stores data
Security purpose	Improved performance purpose
When we are dropping base table then view can't be accessible	When we are dropping base table also materialized view can be accessible
Through the view we can perform DML Operation	We can't perform DML operation

Q69) What are the Different Types of Constraints?

Ans:

- Null Constraint
- Not Null Constraint
- Primary Key Constraint
- Unique Key Constraint
- Foreign Key Constraint
- Composite Primary Key Constraint

- Default Constraint
- Check Constraint

Q) What is normalization? Explain different levels of normalization?

Ans. It is the way to eliminate redundant data

1. Reduces null value
2. Enables efficient indexing
3. 1NF – Removes duplicated attributes, Attribute data should be atomic, and attribute should be same kind.
4. 2NF – Should be in 1NF and each non-key is fully dependent on the primary key.
5. 3NF – Should be in 2NF and all the non-key attributes which are not dependent on the primary key should be removed. All the attributes which are dependent on the other non-key attributes should also be removed. Normalization is done in OLTP.

Q3) What is denormalization and when would you go for it?

Ans. It is the reverse process of normalization. It increases query performance by reducing the joins. It is used for OLAP applications.

Q4) How do you implement one-to-one, one-to-many and many-to-many relationships while designing tables?

Ans. Relationships in SQL server are explained below

1. One to One –It can be implemented as a single table. Rarely it is implemented in two tables. For each instance, in the first entity, there is one and only one in the second entity and vice versa.
2. One to Many –For each instance, in the first entity, there can be one or more in the second entity. For each instance, in the second entity, there can be one and only one instance in the first entity.
3. Many to Many –For each instance, in the first entity there can be one or more instances in the second entity and moreover, for each instance in the second entity there can be one or more instances in the first entity.

Q5) Difference between Primary key and Unique key.

Ans. Primary Key

- 1.Enforces uniqueness of the column in a table
- 2.Default clustered index
- 3.Does not Allow nulls

Unique Key

- 1. Enforces the uniqueness of the column in a table.

- 2.Default non-clustered index.
- 3.Allows one null value

Q. What is sub query and its properties?

A sub-query is a query which can be nested inside a main query like Select, Update, Insert or Delete statements. This can be used when expression is allowed. Properties of sub query can be defined as

- A sub query should not have order by clause
- A sub query should be placed in the right hand side of the comparison operator of the main query
- A sub query should be enclosed in parenthesis because it needs to be executed first before the main query
- More than one sub query can be included

Q. What is a Trigger?

Triggers are used to execute a batch of SQL code when insert or update or delete commands are executed against a table. Triggers are automatically triggered or executed when the data is modified. It can be executed automatically on insert, delete and update operations.

Q. What are the types of Triggers?

There are four types of triggers and they are:

- Insert
- Delete
- Update
- Instead of

Q. What is an IDENTITY column in insert statements?

IDENTITY column is used in table columns to make that column as Auto incremental number or a surrogate key.

Q. What is the difference between UNION and UNION ALL?

- UNION: To select related information from two tables UNION command is used. It is similar to JOIN command.
- UNION All: The UNION ALL command is equal to the UNION command, except that UNION ALL selects all values. It will not remove duplicate rows, instead it will retrieve all rows from all tables.

Q. How Global temporary tables are represented and its scope?

- Global temporary tables are represented with ## before the table name. Scope will be the outside the session whereas local temporary tables are inside the session. Session ID can be found using @@SPID.

Q. How data can be copied from one table to another table?

INSERT INTO SELECT

This command is used to insert data into a table which is already created.

SELECT INTO

This command is used to create a new table and its structure and data can be copied from existing table.

Q) What is the difference between a HAVING CLAUSE and a WHERE CLAUSE?

Answer: The differences between HAVING CLAUSE and WHERE CLAUSE is:

- Both specify a search condition but the HAVING clause is used only with the SELECT statement and typically used with GROUP BY clause.
- If the GROUP BY clause is not used, then the HAVING clause behaves like a WHERE clause only.

Q) What is the Stored Procedure?

Answer: A stored procedure is a set of SQL queries that can take input and send back output. And when the procedure is modified, all clients automatically get the new version. Stored procedures reduce network traffic and improve performance. Stored procedures can be used to help ensure the integrity of the database.

Q) List the advantages of using Stored Procedures?

Answer: Advantages of using Stored procedures are:

- Stored procedure boosts application performance.
- Stored procedure execution plans can be reused as they are cached in SQL Server's memory which reduces server overhead.
- They can be reused.

- It can encapsulate logic. You can change the stored procedure code without affecting clients.
- They provide better security for your data.

Q) What is a Trigger and types of a trigger?

Answer: The trigger allows us to execute a batch of SQL code when table event occurs (INSERT, UPDATE or DELETE command executed against a specific table). Triggers are stored in and managed by DBMS. It can also execute a stored procedure.

3 types of triggers that are available in the SQL Server are as follows:

- **DML Triggers:** DML or Data Manipulation Language triggers are invoked whenever any of the DML commands like INSERT, DELETE or UPDATE happens on the table or the view.
- **DDL Triggers:** DDL or Data Definition Language triggers are invoked whenever any changes occur in the definition of any of the database objects instead of actual data. These are very helpful to control the production and development of database environments.
- **Logon Triggers:** These are very special triggers that fire in case of the logon event of the SQL Server. This is fired before the setup of a user session in the SQL Server.

Q54. 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.

Q55. 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.

DataWarehouse

Q. What does OLAP stand for?

OLAP stands for On Line Analytical Processing. It is a system which collects, manages, and processes multi-dimensional data for analysis and management.

Q. What does OLTP stand for?

OLTP stands for On Line Transaction Processing. It is a system which modifies the data whenever it received, to a large number of concurrent users.

Q. What is a star schema?

Star schema is a schema used in data warehousing where a single fact table references a number of dimension tables. In a star schema, “keys” from all the dimension tables flow into the fact table. This entity-relationship diagram resembles a star, hence it is named a Star schema.

Q. What is a snow flake schema?

Just like the star schema, a single fact table references number of other dimension tables in snow flake scheme. Here however, these dimension tables are further normalized into multiple related tables. As these tables are further snow flaked into smaller tables, this schema is called a snow flake schema.

What are the different types of “dimension”?

- Conformed dimension
- Junk dimension
- Degenerated dimension
- Role Playing dimension

Q. Define fact-less fact.

Fact-less fact is a fact table that does not contain any value. Such a table only contains keys from different dimension tables.

Q. What is Dimension Table?

Dimension table is a table which contain attributes of measurements stored in fact tables. This table consists of hierarchies, categories and logic that can be used to traverse in nodes.

Q. What is Fact Table?

Fact table contains the measurement of business processes, and it contains foreign keys for the dimension tables.

Example – If the business process is manufacturing of bricks

Average number of bricks produced by one person/machine – measure of the business process

Q. What is the difference between OLTP and OLAP?

Following are the differences between OLTP and OLAP:

OLTP	OLAP
Data is from original data source	Data is from various data sources
Simple queries by users	Complex queries by system
Normalized small database	De-normalized Large Database
Fundamental business tasks	Multi-dimensional business tasks

Q. What are Non-additive facts?

Non-Addictive facts are said to be facts that cannot be summed up for any of the dimensions present in the fact table. If there are changes in the dimensions, same facts can be useful.

Q. What is conformed fact?

Conformed fact is a table which can be used across multiple data marts in combined with the multiple fact tables.

Q. What is SCD?

SCD is defined as slowly changing dimensions, and it applies to the cases where record changes over time.

Q. What are the types of SCD?

There are three types of SCD and they are as follows:

SCD 1 – The new record replaces the original record

SCD 2 – A new record is added to the existing customer dimension table

SCD 3 – A original data is modified to include new data

Q. What is surrogate key?

Surrogate key is nothing but a substitute for the natural primary key. It is set to be a unique identifier for each row that can be used for the primary key to a table.

Q. What is the difference between ‘view’ and ‘materialized view’?**View:**

- Tail raid data representation is provided with a view to access data from its table.
- It has logical structure that does not occupy space.
- Changes get affected in the corresponding tables.

Materialized view:

- Pre-calculated data persists in the materialized view.
- It has physical data space occupation.
- Changes will not get affected in the corresponding tables.

