Which TCP/IP port does SQL Server run on?

SQL Server runs on port 1433 but we can also change it for better security.

1. What are three SQL keywords used to change or set someone’s permissions?

Grant, Revoke, Deny

1. From where can you change the default port?

From the Network Utility TCP/IP properties –> Port number. Both on client and the server.

1. What are the four main query statements?
   * 1. SELECT - Used to retrieve information from a database. A SELECT query defines the data you're trying to return and embeds the logic that's required to find and format the results.
     2. INSERT - Used to add rows to a table.
     3. UPDATE - Used to modify rows in a table.
     4. DELETE - Deletes a row from a database table.
2. Can you tell me the difference between DELETE & TRUNCATE commands?
3. Delete command removes the rows from a table based on the condition that we provide with a WHERE clause. Truncate will actually remove all the rows from a table and there will be no data in the table after we run the Truncate command.
4. DELETE removes rows one at a time and records an entry in the transaction log for each deleted row. TRUNCATE removes all rows from a table, but the table structure, its columns, constraints, indexes and so on, remains.
5. TRUNCATE is faster and uses fewer system and transaction log resources than DELETE. TRUNCATE removes the data by deallocating the data pages used to store the table’s data, and only the page deallocations are recorded in the transaction log.
6. DELETE Can be used with or without a WHERE clause.
7. DELETE Activates Triggers. Because TRUNCATE TABLE is not logged, it cannot activate a trigger.
8. DELETE can be rolled back. . TRUNCATE cannot be rolled back.
9. DELETE is DML Command. TRUNCATE is DDL Command.
10. DELETE does not reset identity of the table. TRUNCATE Resets identity of the table
11. Can we use truncate command on a table which is referenced by FOREIGN KEY?

No. We cannot use truncate command on a table with Foreign Key because of referential integrity.

1. What command do we use to rename a db?

sp\_renamedb ‘oldname’ , ‘newname’

1. Well sometimes sp\_reanmedb may not work you know because if someone is using the db it will not accept this command so what do you think you can do in such cases?

In such cases we can first bring db to single user using sp\_dboptions and then we can rename that db and then we can rerun the sp\_dboptions command to remove the single user mode.

1. What is the difference between a HAVING CLAUSE and a WHERE CLAUSE?
2. The Where Clause specifies the criteria which individual records must meet to be selected by a query. It can be used without GROUP BY clause. The HAVING clause cannot be used without the GROUP BY clause.
3. The Where Clause selects rows before grouping. The Having Clause selects rows after Grouping.
4. The Where Clause cannot contain aggregate functions. The HAVING clause can contain aggregate functions
5. What is a Join in SQL Server?

Join actually puts data from two or more tables into a single result set.

1. Can you explain the types of Joins that we can have with SQL Server?

Cross Join: A cross join is a join that does not have a WHERE clause. It 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.

Inner Join: This join returns rows when there is at least one match in both the tables.  This is the default type of join in the Query and View Designer.

Outer Join: This join combines left outer join and right outer join. It returns row from either table when there is a match and returns null value when there is no match.

Left Outer Join: This join returns all the rows from the left table (1st Table) in conjunction with the matching rows from the right table. If there are no columns matching in the right table, it returns NULL values.

Right Outer Join: This join returns all the rows from the right table in conjunction with the matching rows from the left table. If there are no columns matching in the left table, it returns NULL values.

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.

1. Can you explain the role of each service?

SQL SERVER - is for running the databases

SQL AGENT - is for automation such as Jobs, DB Maintenance, Backups

DTC - Is for linking and connecting to other SQL Servers

1. What are the authentication modes in SQL Server? How can it be changed?

Windows mode and mixed mode (SQL & Windows).

To change authentication mode in SQL Server click Start, Programs, and Microsoft SQL Server and click SQL Enterprise Manager to run SQL Enterprise Manager from the Microsoft SQL Server program group. Select the server then from the Tools menu select SQL Server Configuration Properties, and choose the Security page.

1. Where do you think the user’s names and passwords will be stored in SQL server?

They get stored in master db in the sysxlogins table.

1. What is sub-query?

A subquery is a query that is nested inside a SELECT, INSERT, UPDATE, or DELETE statement, or inside another subquery. Subquery is an inner query or inner select, while the statement containing a subquery is also called an outer query or outer select. Sub-query are of two types.

A correlated subquery is an inner subquery which is referenced by the main outer query such that the inner query is considered as being executed repeatedly. A non-correlated subquery is subquery that is independent of the outer query and it can execute on its own without relying on main outer query.

1. What are the properties and different Types of Sub-Queries?

Properties of Sub-Query

* + A sub-query must be enclosed in the parenthesis.
  + A sub-query must be put in the right hand of the comparison operator, and
  + A sub-query cannot contain an ORDER-BY clause.
  + A query can contain more than one sub-query.

Types of Sub-query

* + Single-row sub-query, where the sub-query returns only one row.
  + Multiple-row sub-query, where the sub-query returns multiple rows,. and
  + Multiple column sub-query, where the sub-query returns multiple columns

1. What is Constraint?

Constraint is a property assigned to a column or the set of columns in a table that prevents certain types of inconsistent data values from being placed in the column(s).

1. How many Types of Constrains?

Microsoft SQL server supports the Following Constraints:

PRIMARY KEY UNIQUE FOREIGN KEY CHECK DEFAULT NOT NULL

1. What is PRIMARY KEY?

Primary keys are the unique identifiers for each row. They contain unique values and cannot be null. Due to their importance in relational databases, Primary keys are the most fundamental of all keys and constraints. A table can have only one Primary key. The primary key constraints are used to enforce entity integrity.

1. What is UNIQUE KEY constraint?

A UNIQUE KEY constraint enforces the uniqueness of the values in a set of columns, so no duplicate values are entered. The unique key constraints are used to enforce entity integrity as the primary key constraints. It contains one null value.

1. What is FOREIGN KEY?

A foreign key (FK) is a column or combination of columns used to establish and enforce a link between the data in two tables. It points to the primary key of another table. The purpose of the foreign key is to ensure referential integrity of the data. Foreign key is a referential constraint between two tables.

1. How many Foreign Keys can we have in one table?

Not more than 253 constraints.

1. What is CHECK Constraint?

A CHECK constraint designates a condition that must be met before data can be inserted into a column. It is used to limit the value range that can be placed in a column. The check constraints are used to enforce domain integrity.

1. What is NOT NULL Constraint?

A NOT NULL constraint enforces that the column will not accept null values. The not null constraints are used to enforce domain integrity.

1. What is Default Constraint?

DEFAULT constraints allow you to specify a value that the database will use to populate fields that are left blank in the input source.

1. What is Composite Key?

When we define more than one column as a primary key on a table, it is called a composite key.

1. What is Candidate key?

A key that uniquely identifies rows in a table is called Candidate Key. Any of the identified candidate keys can be used as the table's primary key

1. What is Alternate Key?

Any of the candidate keys that are not part of the primary key is called an alternate key.

1. What is ON CASCADE DELETE?

Use of ON DELETE CASCADE option deletes the rows in a child table when corresponding rows are deleted in the parent table

1. What is ON CASCADE NULL?

Use of ON CASCADE NULL option replaces the rows with NULL values in a child table when corresponding rows are deleted in the parent table

1. What is WITH NO CHECK?

No Check allows you to create referential integrity without worrying weather existing data matches the referential integrity rule or not. It creates check constraint ignoring already existing data.

1. What is Referential Integrity?

Referential integrity refers to the consistency that must be maintained between primary and foreign keys, i.e. every foreign key value must have a corresponding primary key value

1. What command do we use to rename a db, a table and a column?

If someone is using db it will not accept sp\_renmaedb. In that case first bring db to single user using sp\_dboptions. Use sp\_renamedb to rename database. Use sp\_dboptions to bring database to multi user mode. Example: USE master; GO EXEC sp\_dboption AdventureWorks, 'Single-User', True GO EXEC sp\_renamedb 'AdventureWorks', 'AdventureWorks\_New' GO EXEC sp\_dboption AdventureWorks, 'Single User', False GO

To rename Table

sp\_rename 'oldTableName' 'newTableName'

To rename Column

sp\_rename 'TableName.[OldcolumnName]', 'NewColumnName', 'Column'

1. Different types of SQL Server System Databases
   * 1. Master---- Records all the system-level information for an instance of SQL Server.
     2. MSDB -----Used by SQL Server Agent for scheduling alerts and jobs
     3. Model ----Used as a template for the entire database created on the instance of SQL Server
     4. TempDB--- Workspace for holding temporary objects or intermediate results

* The Master database holds information for all databases located on the SQL Server instance and is the glue that holds the engine together. Because SQL Server cannot start without a functioning master database, you must administer this database with care.
* The MSDB database stores information regarding database backups, SQL Agent information, DTS packages, SQL Server jobs, and some replication information such as for log shipping.
* The TempDB holds temporary objects such as global and local temporary tables and stored procedures.
* The Model is essentially a template database used in the creation of any new user database created in the instance.
* The resoure Database is a read-only database that contains all the system objects that are included with SQL Server. SQL Server system objects, such as sys.objects, are physically persisted in the Resource database, but they logically appear in the sys schema of every database. The Resource database does not contain user data or user metadata.

1. What does TOP Operator Do?

The TOP operator is used to specify the number of rows to be returned by a query. The TOP operator has new addition in SQL SERVER 2008 that it accepts variables as well as literal values and can be used with INSERT, UPDATE, and DELETES statements.

1. What is CTE?

CTE is an abbreviated as Common Table Expression. A CTE can be thought of as a temporary result set that is defined within the execution scope of a single SELECT, INSERT, UPDATE, DELETE, or CREATE VIEW statement. A CTE is similar to a derived table and lasts only for the duration of the query. Unlike a derived table, a CTE can be self-referencing and can be referenced multiple times in the same query.

1. What are the Advantages of using CTE?
   * Using CTE improves the readability and makes maintenance of complex queries easy.
   * The query can be divided into separate, simple, logical building blocks which can be then used to build more complex CTEs until final result set is generated.
   * CTE can be defined in functions, stored procedures, triggers or even views.
   * After a CTE is defined, it can be used as a Table or a View and can SELECT INSERT, UPDATE or DELETE Data.
2. What is use of EXCEPT Clause?

Except query and MINUS query returns all rows in the first query that are not returned in the second query. It is similar to MINUS in Oracle. Each SQL statement within the EXCEPT query and MINUS query must have the same number of fields in the result sets with similar data types.

1. Can we rewrite sub-queries into simple select statements or with joins?

Yes we can write using Common Table Expression (CTE).

1. What is the maximum size of a row?

8060 Bytes

1. What is MERGE Statement?

MERGE is a new feature that provides an efficient way to perform multiple DML operations. In previous versions of SQL Server, we had to write separate statements to INSERT, UPDATE, or DELETE data based on certain conditions, but now, using MERGE statement we can perform INSERT, UPDATE, or DELETE operations on a target table based on the results of a join with a source table. One of the most important advantages of MERGE statement is all the data is read and processed only once.

1. What is Aggregate Functions?

Aggregate functions perform a calculation on a set of values and return a single value. Aggregate functions ignore NULL values except COUNT function. HAVING clause is used, along with GROUP BY, for filtering query using aggregate values.

Following functions are aggregate functions: AVG, MIN, CHECKSUM\_AGG, SUM, COUNT, STDEV, COUNT\_BIG, STDEVP, GROUPING, VAR, MAX.

1. What is Row\_Number?

ROW\_NUMBER is a function that returns the sequential number of a row within a partition of a result set, starting at 1 for the first row in each partition. This is only a number used in the context of the result set, if the result changes, the ROW\_NUMBER will change.

1. What are Ranking Functions?

Ranking functions return a ranking value for each row in a partition. All the ranking functions are non-deterministic. Different Ranking functions are:

1. ROW\_NUMBER () OVER ([<partition\_by\_clause>] <order\_by\_clause>)  
   Returns the sequential number of a row within a partition of a result set, starting at 1 for the first row in each partition.
2. RANK () OVER ([<partition\_by\_clause>] <order\_by\_clause>)  
   Returns the rank of each row within the partition of a result set.
3. DENSE\_RANK () OVER ([<partition\_by\_clause>] <order\_by\_clause>)  
   Returns the rank of rows within the partition of a result set, without any gaps in the ranking.
4. What’s the difference between a primary key and a unique key?

Both primary key and unique key enforces uniqueness of the column on which they are defined.

But by default primary key creates a clustered index on the column, where are unique creates a non-clustered index by default.

We can have multiple unique keys but only 1 primary key in a table.

Another major difference is that, primary key doesn’t allow NULLs, but unique key allows one NULL only.

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

The UNION command is used to select related information from two tables, much like the JOIN command. The basic rules for combining the result set using UNION is the Number and Order of the columns must be same in all queries and the Data Types must be compatible.

The difference between Union and Union all is that Union all will not eliminate duplicate rows, instead it just pulls all rows from all tables fitting your query specifics and combines them into a table.

1. Can SQL Servers linked to other servers like Oracle?

SQL Server can be linked to any server provided it has OLE-DB provider from Microsoft to allow a link. E.g. Oracle has an OLE-DB provider for oracle that Microsoft provides to add it as linked server to SQL Server group

1. What is Identity?

Identity (or AutoNumber) is a property used with Create Table or Alter Table Transact-SQL statements. It automatically generates numeric values.

Syntax: Identity (seed, increment)

A seed is a value used for the very first row loaded into the table and increment value is the value that is added to the identity value of the previous row that was loaded.

1. What is Select @@Identity-It returns the last IDENTITY value produced on a connection, regardless of the table that produced the value, and regardless of the scope of the statement that produced the value.
2. What is SELECT SCOPE\_IDENTITY()  
   It returns the last IDENTITY value produced on a connection and by a statement in the same scope, regardless of the table that produced the value.
3. What Is SELECT IDENT\_CURRENT(‘tablename’)  
   It returns the last IDENTITY value produced in a table, regardless of the connection that created the value, and regardless of the scope of the statement that produced the value.
4. What are different types of Database Recovery Models

Full Recovery Model

Bulk Logged Recovery Model

Simple Recovery Model

1. What are different types of Backups?
   1. Full Backup—Backs up all the information stored in the respective database. Takes the longest time to complete.
   2. Differential Backup—Backs up portion of database that has been modified since the last full or complete backup (or) It is a backup of database information that has changed since last full backup
   3. Transaction Log (T-Log) Backup—Backs up the changes that has been logged in the transaction log for the database. In Simple recovery model transaction log backup is not allowed.
2. Different SQL Server Protocols

Shared Protocol---Application and Database on same Server

Named Pipes-----Application and Database on different Server (Less Preferred)

TCP/IP-------------Application and Database on different Server

VIA ---------------- Used on Non-Window Platform

1. Default startup Parameters in SQL Server 2008.

–d master\_data\_file\_path

–l master\_log\_file\_path

–e error\_log\_path

STORED PROCEDURES

1. What is Stored Procedure?

It is nothing but a set of T-SQL statements combined to perform a single task of several tasks. It is basically like a Macro so when you invoke the Stored procedure, you actually run a set of statements.

1. Advantages of Stored Procedures

* Execution plan retention and reuse
* Consistent, safe data modification
* Network bandwidth conservation
* Reduced development cost and increased reliability
* Sharing of application logic between applications
* Improved security
* Support for automatic execution at system start-up
* Enhanced hardware and software capabilities
* Encapsulation of business rules and policies
* Application modularization
* Access to database objects that is both secure and uniform
* Query auto-parameterization
* Centralized security, administration, and maintenance for common routines

1. Types Of Stored Procedures

Temporary Stored Procedures

1. Local Temporary Procedure
2. Global Temporary procedure

System defined Sp

1. Can a stored procedure call another stored procedure? If yes what level and can it is controlled?

Yes a sp can call another sp. They can call up to 32 levels.

1. Can a stored procedure call itself (recursive). If yes what level and can it is controlled?

Yes a sp can call itself .Maximum of 32 levels.

1. What is an execution plan? When would you use it? How would you view the execution plan?

A query execution plan outlines how the SQL Server query optimizer actually ran (or will run) a specific query. This information is very valuable when it comes time to find out why a specific query is running slow.

There are several different ways to view a query's execution plan. They include: From within Query Analyzer is an option called "Show Execution Plan" (located on the Query drop-down menu). If you turn this option on, then whenever you run a query in Query Analyzer, you will get a query execution plan (in graphical format) displayed in a separate window.

If you want to see an execution plan, but you don't want to run the query, you can choose the option "Display Estimated Execution Plan" (located on the Query drop-down menu). When you select this option, immediately an execution plan (in graphical format) will appear. The difference between these two (if any) is accountable to the fact that when a query is really run (not simulated, as in this option), current operations of the server are also considered. In most cases, plans created by either method will produce similar results.

When you create a SQL Server Profiler trace, one of the events you can collect is called MISC: Execution Plan. This information (in text form) shows the execution plan used by the query optimizer to execute the query.

From within Query Analyzer, you can run the command SET SHOWPLAN\_TEXT ON. Once you run this command, any query you execute in this Query Analyzer sessions will not be run, but a text-based version of the query plan will be displayed. If the query you are running uses temp tables, then you will have to run the command, SET STATISTICS PROFILE ON before running the query.

1. How long Store Procedure will be present in cache
   1. Until there is a huge change of data
   2. Statistics are updated manually
2. What is BCP? When does it used?

Bulk-Copy is a tool used to copy huge amount of data from tables and views. BCP does not copy the structures same as source to destination. BULK INSERT command helps to import a data file into a database table or view in a user-specified format.

Functions

1. What is a function

Function is a prepared code segment that can accept parameters, process some logic, and then return some data. Function can be invoked in a select statement

1. Types of Functions

There are two types of function.

1. Scalar valued function

2. Table valued function

1. What are Scalar functions

SQL scalar functions return a single value, based on the input value.

1. What are the benefits of User-Defined Functions?

a. Can be used in a number of places without restrictions as compared to stored procedures.

b. Code can be made less complex and easier to write.

c. Parameters can be passed to the function.

d. They can be used to create joins and also be used in a select, where or case statement.

e. Simpler to invoke.

1. Differences between Functions and Stored Procedures
   1. UDF can be used anywhere in the SQL statements where as Stored procedures cannot be.
   2. Function should Return a value where as Store Procedure may or may not return a value.
   3. Functions can have only input parameters where as Store Procedure can have input, output parameters for it.
   4. When T-SQL encounters an error the function stops, while T-SQL will ignore an error in Store Procedure and proceed to the next statement in your code.
   5. Store Procedure can be used in an XML FOR clause, a UDF cannot.
   6. Store Procedure adds more overhead to server than UDF.
   7. UDF cannot change the server environment or the operating system environment, while a Store Procedure can.
   8. Functions cannot return Images, Texts where as Store Procedure can.
   9. Functions are used for computations where as Store Procedures can be used for performing business logic
   10. Functions can be invoked in SELECT statement; whereas Store Procedure can only be executed.
2. What is User defined function and System defined function

A User-Defined Function, or UDF, is a function provided by the user of a program or environment, in a context where the usual assumption is that functions are built into the program or environment.

1. What is Deterministic Function?

Deterministic functions always return the same output result all the time it is executed for same input values I.e. ABS, DATEDIFF, ISNULL etc.

1. What is Nondeterministic Function?

Nondeterministic functions may return different results each time they are executed. i.e. NEWID, RAND, @@CPU\_BUSY etc. Functions that call extended stored procedures are nondeterministic.

1. What is user-defined function? Explain its types i.e. scalar and Inline table value user-defined function.

User defined functions are created and defined by the user. They are created as per users needs. They may or may not accept parameters. They can be used to create joins and simple to invoke as compared to stored procedures

Types:  
Scalar user defined: returns values as one of the scalar data types. Text, timestamp, image data types are not supported. It may or may not accept parameters.

Inline table value user defined: it returns a table data type. These functions can pass parameters to the SQL’s SELECT command. They are similar to views except, they can accept parameters.

INDEXES

1. What are Indexes?  
   Indexes are database objects that are created on a table which helps in retrieving data more quickly and efficiently. It follows a B-Tree (Balanced Tree) structure. B-Tree structure comprises of three levels. Root Level, Intermediate Level and Leaf Level. Data is stored in Leaf Level in case of clustered Index whereas data pointer (address location) to the data is pointed in case of non-clustered index.
2. Types of Index   
   Indexes are categorized into 8 types. Clustered Index, Non-clustered Index, Unique, and Rows with columns, Full-Text, Spatial, Filtered and XML.
3. Define Types of Indexes

Clustered Index: A clustered Index sorts and stores the data rows of the table or views in order based on clustered index key.

Non-Clustered Index: A non-clustered index can be defined on a table or view with a clustered index or on a heap. Each index row in the non-clustered index contains the non-clustered key value and a row locator. This locator points to the data row in the clustered index or heap having the key value.

Unique: A unique index ensures that the index key contains no duplicate values and therefore every row in the table or view is in some way unique.

Rows with Columns: A non-clustered index that is extended to include non-key columns in addition to the key columns.

Full Text: A special type of token-based functional index that is built and maintained by the Microsoft Full-Text Engine for SQL Server. It provides efficient support for sophisticated word searches in character string data.

Spatial: A spatial index provides the ability to perform certain operations more efficiently on spatial objects (spatial data) in a column of the geometry data type. The spatial index reduces the number of objects on which relatively costly spatial operations need to be applied.

Filtered: An optimized non-clustered index especially suited to cover queries that select from a well-defined subset of data. It uses a filter predicate to index a portion of rows in the table

XML: A shredded, and persisted, representation of the XML binary large objects (BLOBs) in the xml data type column.

1. As a part of your job, what are the DBCC commands that you commonly use for database maintenance?

DBCC CHECKDB, DBCC CHECKTABLE, DBCC CHECKCATALOG, DBCC CHECKALLOC, DBCC SHOWCONTIG, DBCC SHRINKDATABASE, DBCC SHRINKFILE, DBCC REINDEX (if pages scattered more than 10% we need to re-index) etc.

1. When do we use the UPDATE\_STATISTICS command?

This command is basically used when we do a large processing of data. If we do a large amount of deletions or any modifications or Bulk Copy into the tables, we need to basically update the indexes to take these changes into account. UPDATE\_STATISTICS updates the indexes on these tables accordingly.

1. What are statistics, under what circumstances they go out of date, and how do you update them?

Statistics determine the selectivity of the indexes. If an indexed column has unique values then the selectivity of that index is more, as opposed to an index with non-unique values. Query optimizer uses these indexes in determining whether to choose an index or not while executing a query.

SQL Server automatically creates statistics when you create a database. You can set it off but don’t do it. It maintains statistics on index and key columns of all of the tables.

Some situations under which you should update statistics are:

* + 1. If there is significant change in the key values in the index
    2. If a large amount of data in an indexed column has been added, changed, or removed (i.e. if the distribution of key values has changed), or the table has been truncated using the TRUNCATE TABLE statement and then repopulated.
    3. Database is upgraded from a previous version

1. How can I enforce to use particular index

You can use hint (index=index\_name) after the table name. SELECT au\_lname FROM authors (index=aunmind)

1. Can you give me some DBCC command options?(Database consistency check) -
   1. DBCC CHECKDB - Ensures that tables in the db and the indexes are correctly linked.
   2. DBCC CHECKALLOC - To check that all pages in a db are correctly allocated.
   3. DBCC SQLPERF – It gives report on current usage of transaction log in percentage.
   4. DBCC CHECKFILEGROUP - Checks all tables file group for any damage.
2. How do you know which index a table is using?

From a query analyzer menu Choose Show executions plan, after you execute a statement on a result window you will see execution plan point courser on first figure from left it will display what kind of index use.

You can also run system store procedure sp\_help objectname to find out what kind of index are created on table.

1. Difference between Cluster and Non-cluster index?

Clustered Index sorts and stores the data rows of the table or views in order based on clustered index key where as Non-cluster Index sorts and stores the data rows of the table or view with a clustered index or on a heap.

The table can have only 1 clustered Index where as it can have 249(for SQL Server 2005) or 999(for SQL Server 2008) non-clustered Index.

Clustered Index is faster to read than non-clustered as data is physically stored in index order.

Insert and Update operations are quicker in Non-clustered Index compared to clustered Index.

1. What is HEAP? (OR) What is a table called, if it does have neither Cluster nor Non-cluster Index?

A Table with No Index (OR) if a table does not contain cluster or non cluster index it is called heap table.

1. Can I make a Primary key not to be Clustered Index?

Yes

1. What is size of a Page

Size of a page is 8 Kbytes.

1. What is an Extent?

Extent is combination of 8 pages.

1. What is size of an Extent

Size of a page is 64 Kbytes.

1. What is Fill Factor?

Fill factor is the value that determines the percentage of space on each leaf-level page to be filled with data. The default value for Fill Factor is 100, which is same as value 0. There will be no or very little empty space left in the page, when the fill factor is 100.

1. What is Pad Index?

Pad Index represents the same percentage (as that of Fill factor) at the non-leaf level of the index. PAD\_INDEX ON means “Apply fill factor to all layers” i.e. Root level and Intermediate levels.

1. What is External Fragmentation?

When on disk, the physical storage of pages and extents is not contiguous. When the extents of a table are not physically stored contiguously on disk, switching from one extent to another causes higher disk rotations, and this is called Extent Fragmentation.

1. What is Internal Fragmentation?

Internal Fragmentation is said to occur if there is unused space between records in a page. It is due to deletes and updates.

1. What is Bookmark Lookup?

A bookmark lookup is the process of finding the actual data in the SQL table, based on an entry found in a non-clustered index. When you search for a value in a non-clustered index, and your query needs more fields than are part of the index leaf node (all the index fields, plus any possible INCLUDE columns), then SQL Server needs to go retrieve the actual data pages. Bookmark Lookup affects the performance.

1. How to avoid Bookmark Lookup?

In case of clustered Index use composite Clustered Index and In case of Non-clustered Index use Non-clustered Index with Included columns.

1. Order of Indexes

Always create Clustered Index first and non-cluster Index later.

1. What is covered Index?

A query is covered if all the columns it uses come from one or more indexes. These columns include the columns you want the query to return as well as columns in any JOIN, WHERE, HAVING, and ORDER BY clause.

1. What is covering Index?

Covering index is also a type of composite index which covers a query. In other words, it includes all the columns that are needed to execute a query.

Triggers

1. What is a Trigger?

Trigger is a special kind of stored procedure that executes automatically when a user attempts the specified data-modification or data defining statement on the specified table. Triggers are used to maintain the referential integrity of data by changing the data in a systematic fashion. The difference between SP and Trigger is that it can be activated when data is added or edited or deleted from a table in a database.

1. What is a DDL Trigger?-DDL triggers are a special kind of trigger that fire in response to Data Definition Language (DDL) statements. They can be used to perform administrative tasks in the database such as auditing and regulating database operations.
2. What is a DML Trigger?

A DML trigger is an action programmed to execute when a data manipulation language (DML) event occurs in the database server. DML events include UPDATE, INSERT, or DELETE statements issued against a table or view. DML triggers are used to enforce business rules when data is modified and to extend the integrity checking logic of SQL Server constraints, defaults, and rules.

1. Can we have a trigger for TRUNCATE command? No
2. Explain Magic Tables?

Whenever a trigger is fired two special tables (INSERTED & DELETED tables) are created. These are called as Magic Tables. These are the conceptual tables and are similar in structure to the table on which trigger is defined.

The INSERTED table contains a copy of all records that are inserted in trigger table.

The DELETED table contains all records that have been deleted from the trigger table.

Whenever an UPDATE takes place, the trigger uses both the inserted and deleted tables.

1. What is the difference between a foreign key constraint and Trigger?

Both Foreign Key and Trigger are used to maintain referential integrity of data. For Foreign Key constraint, both parent and child tables should be in same database. Triggers can be created on a table in one database can call the table in other database. So, Triggers can go across databases.

1. Explain ’INSTEAD OF’ and ‘AFTER’ options in a trigger?

INSTEAD OF causes the trigger to fire instead of executing the triggering event or action. It prevents unnecessary changes to be made. ‘AFTER’ fires the trigger after executing the triggering event or action.

1. Can we define an AFTER trigger on a view?

No. We can only define INSTEAD OF trigger on views

5. What will be the default trigger type if we didn’t mention anything in the code? - AFTER Trigger

1. Explain Direct & Indirect Recursion in triggers?-Direct Recursion: If Trigger A causes an event that fires Trigger A

Indirect Recursion: If Trigger A causes an event that fires Trigger B which in return causes an event that fires Trigger A

Nested Trigger: If Trigger A causes an event that fires Trigger B. //Disabling the RECURSIVE\_TRIGGERS setting only prevents direct recursions. To disable indirect recursion also, set the nested triggers server option to 0 by using sp\_configure. If nested triggers is off, recursive triggers is also disabled, regardless of the RECURSIVE\_TRIGGERS setting set by using ALTER DATABASE

1. Up to what level the triggers are nested? -32
2. What will be the firing sequence among a Declarative Referential Integrity constraint (Foreign Key), AFTER trigger and INSTEAD OF trigger?

INSTEAD OF trigger, Foreign Key, AFTER trigger

1. Can a trigger call a Stored Procedure? - yes
2. Does a trigger follow Deferred Name Resolution? - yes
3. How many triggers can be implemented in a table?-There is no limit on the no. of triggers that can be implemented on a table. But, it is good to keep their number as low as possible.

**VIEWS**

1. What is a view? -

If we have several tables in a db and we want to view only specific columns from specific tables we can go for views. It would also suffice the needs of security sometimes allowing specific users to see only specific columns based on the permission that we can configure on the view. Views also reduce the effort that is required for writing queries to access specific columns every time.

1. Is a view Updatable?

A view is created by joining one or more tables. When you update records in a view, it updates

the records in the underlying tables that make up the view. So, yes, you can update the data in a

view providing you have the proper privileges to the underlying tables.

You cannot update a view if there is a Group by Statement. You also cannot update a view if it has multiple tables.

1. How can I prevent a Table from being dropped in a view?

Views or tables that participate in a view created with the SCHEMABINDING clause cannot be

dropped unless that view is dropped or changed so that it no longer has schema binding.

1. 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.
2. What is a transaction and what are ACID properties?

A transaction is a logical unit of work in which, all the steps must be performed or none. ACID stands for Atomicity, Consistency, Isolation, and Durability. These are the properties of a transaction.

1. What is OLTP (Online Transaction Processing)?

In OLTP – online transaction processing systems relational database design use the discipline of data modeling and generally follow the Codd rules of data normalization in order to ensure absolute data integrity. Using these rules complex information is broken down into its most simple structures (a table) where all of the individual atomic level elements relate to each other and satisfy the normalization rules.