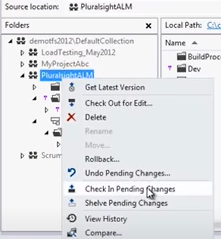
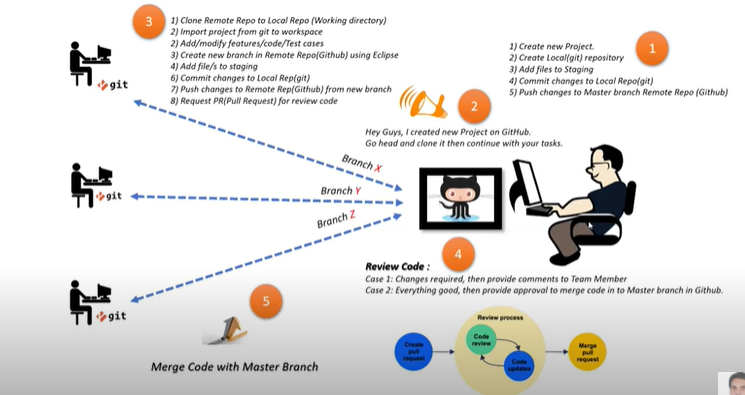
TFS



GIT



# **1. What is DBMS?**

A Database Management System (DBMS) is a program that controls creation, maintenance and use of a database. DBMS can be termed as File Manager that manages data in a database rather than saving it in file systems.

# **2. What is RDBMS?**

RDBMS stands for Relational Database Management System. RDBMS store the data into the collection of tables, which is related by common fields between the columns of the table. It also provides relational operators to manipulate the data stored into the tables.

**Example: SQL Server.**

# **3. What is SQL?**

SQL stands for Structured Query Language, and it is used to communicate with the Database. This is a standard language used to perform tasks such as retrieval, updation, insertion and deletion of data from a database.

Standard SQL Commands are Select.

# **4. What is a Database?**

Database is nothing but an organized form of data for easy access, storing, retrieval and managing of data. This is also known as structured form of data which can be accessed in many ways.

Example: School Management Database, Bank Management Database.

# **5. What are tables and Fields?**

A table is a set of data that are organized in a model with Columns and Rows. Columns can be categorized as vertical, and Rows are horizontal. A table has specified number of column called fields but can have any number of rows which is called record.

Example:.

Table: Employee.

Field: Emp ID, Emp Name, Date of Birth.

Data: 201456, David, 11/15/1960.

# **6. What is a primary key?**

A primary key is a combination of fields which uniquely specify a row. This is a special kind of unique key, and it has implicit NOT NULL constraint. It means, Primary key values cannot be NULL.

# **7. What is a unique key?**

A Unique key constraint uniquely identified each record in the database. This provides uniqueness for the column or set of columns.

A Primary key constraint has automatic unique constraint defined on it. But not, in the case of Unique Key.

There can be many unique constraint defined per table, but only one Primary key constraint defined per table.

# **8. What is a foreign key?**

A foreign key is one table which can be related to the primary key of another table. Relationship needs to be created between two tables by referencing foreign key with the primary key of another table.

# **9. What is a join?**

This is a keyword used to query data from more tables based on the relationship between the fields of the tables. Keys play a major role when JOINs are used.

# **10. What are the types of join and explain each?**

There are various types of join which can be used to retrieve data and it depends on the relationship between tables.

* **Inner Join.**

Inner join return rows when there is at least one match of rows between the tables.

* **Right Join.**

Right join return rows which are common between the tables and all rows of Right hand side table. Simply, it returns all the rows from the right hand side table even though there are no matches in the left hand side table.

* **Left Join.**

Left join return rows which are common between the tables and all rows of Left hand side table. Simply, it returns all the rows from Left hand side table even though there are no matches in the Right hand side table.

* **Full Join.**

Full join return rows when there are matching rows in any one of the tables. This means, it returns all the rows from the left hand side table and all the rows from the right hand side table.

# **11. What is normalization?**

Normalization is the process of minimizing redundancy and dependency by organizing fields and table of a database. The main aim of Normalization is to add, delete or modify field that can be made in a single table.

# **12. What is Denormalization.**

DeNormalization is a technique used to access the data from higher to lower normal forms of database. It is also process of introducing redundancy into a table by incorporating data from the related tables.

# **13. What are all the different normalizations?**

The normal forms can be divided into 5 forms, and they are explained below -.

* **First Normal Form (1NF):.**

This should remove all the duplicate columns from the table. Creation of tables for the related data and identification of unique columns.

* **Second Normal Form (2NF):.**

Meeting all requirements of the first normal form. Placing the subsets of data in separate tables and Creation of relationships between the tables using primary keys.

* **Third Normal Form (3NF):.**

This should meet all requirements of 2NF. Removing the columns which are not dependent on primary key constraints.

* **Fourth Normal Form (4NF):.**

Meeting all the requirements of third normal form and it should not have multi- valued dependencies.

# **14. What is a View?**

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

# **15. What is an Index?**

An index is performance tuning method of allowing faster retrieval of records from the table. An index creates an entry for each value and it will be faster to retrieve data.

# **16. What are all the different types of indexes?**

There are three types of indexes -.

* **Unique Index.**

This indexing does not allow the field to have duplicate values if the column is unique indexed. Unique index can be applied automatically when primary key is defined.

* **Clustered Index.**

This type of index reorders the physical order of the table and search based on the key values. Each table can have only one clustered index.

* **NonClustered Index.**

NonClustered Index does not alter the physical order of the table and maintains logical order of data. Each table can have 999 nonclustered indexes.

# **17. What is a Cursor?**

A database Cursor is a control which enables traversal over the rows or records in the table. This can be viewed as a pointer to one row in a set of rows. Cursor is very much useful for traversing such as retrieval, addition and removal of database records.

# **18. What is a relationship and what are they?**

Database Relationship is defined as the connection between the tables in a database. There are various data basing relationships, and they are as follows:.

* One to One Relationship.
* One to Many Relationship.
* Many to One Relationship.
* Self-Referencing Relationship.

# **19. What is a query?**

A DB query is a code written in order to get the information back from the database. Query can be designed in such a way that it matched with our expectation of the result set. Simply, a question to the Database.

# **20. What is subquery?**

A subquery is a query within another query. The outer query is called as main query, and inner query is called subquery. SubQuery is always executed first, and the result of subquery is passed on to the main query.

# **21. What are the types of subquery?**

There are two types of subquery – Correlated and Non-Correlated.

A correlated subquery cannot be considered as independent query, but it can refer the column in a table listed in the FROM the list of the main query.

A Non-Correlated sub query can be considered as independent query and the output of subquery are substituted in the main query.

# **22. What is a stored procedure?**

Stored Procedure is a function consists of many SQL statement to access the database system. Several SQL statements are consolidated into a stored procedure and execute them whenever and wherever required.

# **23. What is a trigger?**

A DB trigger is a code or programs that automatically execute with response to some event on a table or view in a database. Mainly, trigger helps to maintain the integrity of the database.

Example: When a new student is added to the student database, new records should be created in the related tables like Exam, Score and Attendance tables.

# **24. What is the difference between DELETE and TRUNCATE commands?**

DELETE command is used to remove rows from the table, and WHERE clause can be used for conditional set of parameters. Commit and Rollback can be performed after delete statement.

TRUNCATE removes all rows from the table. Truncate operation cannot be rolled back.

# **25. What are local and global variables and their differences?**

Local variables are the variables which can be used or exist inside the function. They are not known to the other functions and those variables cannot be referred or used. Variables can be created whenever that function is called.

Global variables are the variables which can be used or exist throughout the program. Same variable declared in global cannot be used in functions. Global variables cannot be created whenever that function is called.

# **26. What is a constraint?**

Constraint can be used to specify the limit on the data type of table. Constraint can be specified while creating or altering the table statement. Sample of constraint are.

* NOT NULL.
* CHECK.
* DEFAULT.
* UNIQUE.
* PRIMARY KEY.
* FOREIGN KEY.

# **27. What is data Integrity?**

Data Integrity defines the accuracy and consistency of data stored in a database. It can also define integrity constraints to enforce business rules on the data when it is entered into the application or database.

# **28. What is Auto Increment?**

Auto increment keyword allows the user to create a unique number to be generated when a new record is inserted into the table. AUTO INCREMENT keyword can be used in Oracle and IDENTITY keyword can be used in SQL SERVER.

Mostly this keyword can be used whenever PRIMARY KEY is used.

# **29. What is the difference between Cluster and Non-Cluster Index?**

Clustered index is used for easy retrieval of data from the database by altering the way that the records are stored. Database sorts out rows by the column which is set to be clustered index.

A nonclustered index does not alter the way it was stored but creates a complete separate object within the table. It point back to the original table rows after searching.

# **30. What is Datawarehouse?**

Datawarehouse is a central repository of data from multiple sources of information. Those data are consolidated, transformed and made available for the mining and online processing. Warehouse data have a subset of data called Data Marts.

# **31. What is Self-Join?**

Self-join is set to be query used to compare to itself. This is used to compare values in a column with other values in the same column in the same table. ALIAS ES can be used for the same table comparison.

# **32. What is Cross-Join?**

Cross join defines as Cartesian product where number of rows in the first table multiplied by number of rows in the second table. If suppose, WHERE clause is used in cross join then the query will work like an INNER JOIN.

# **33. What is user defined functions?**

User defined functions are the functions written to use that logic whenever required. It is not necessary to write the same logic several times. Instead, function can be called or executed whenever needed.

# **34. What are all types of user defined functions?**

Three types of user defined functions are.

* Scalar Functions.
* Inline Table valued functions.
* Multi statement valued functions.

Scalar returns unit, variant defined the return clause. Other two types return table as a return.

# **35. What is collation?**

Collation is defined as set of rules that determine how character data can be sorted and compared. This can be used to compare A and, other language characters and also depends on the width of the characters.

ASCII value can be used to compare these character data.

# **36. What are all different types of collation sensitivity?**

Following are different types of collation sensitivity -.

* Case Sensitivity – A and a and B and b.
* Accent Sensitivity.
* Kana Sensitivity – Japanese Kana characters.
* Width Sensitivity – Single byte character and double byte character.

# **37. Advantages and Disadvantages of Stored Procedure?**

Stored procedure can be used as a modular programming – means create once, store and call for several times whenever required. This supports faster execution instead of executing multiple queries. This reduces network traffic and provides better security to the data.

Disadvantage is that it can be executed only in the Database and utilizes more memory in the database server.

# **38. What is Online Transaction Processing (OLTP)?**

Online Transaction Processing (OLTP) manages transaction based applications which can be used for data entry, data retrieval and data processing. OLTP makes data management simple and efficient. Unlike OLAP systems goal of OLTP systems is serving real-time transactions.

Example – Bank Transactions on a daily basis.

# **39. What is CLAUSE?**

SQL clause is defined to limit the result set by providing condition to the query. This usually filters some rows from the whole set of records.

Example – Query that has WHERE condition

Query that has HAVING condition.

# **40. What is recursive stored procedure?**

A stored procedure which calls by itself until it reaches some boundary condition. This recursive function or procedure helps programmers to use the same set of code any number of times.

# **41. What is Union, minus and Interact commands?**

UNION operator is used to combine the results of two tables, and it eliminates duplicate rows from the tables.

MINUS operator is used to return rows from the first query but not from the second query. Matching records of first and second query and other rows from the first query will be displayed as a result set.

INTERSECT operator is used to return rows returned by both the queries.

# **42. What is an ALIAS command?**

ALIAS name can be given to a table or column. This alias name can be referred in WHERE clause to identify the table or column.

Example-.

Select st.StudentID, Ex.Result from student st, Exam as Ex where st.studentID = Ex. StudentID

Here, st refers to alias name for student table and Ex refers to alias name for exam table.

# **43. What is the difference between TRUNCATE and DROP statements?**

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

# **44. What are aggregate and scalar functions?**

Aggregate functions are used to evaluate mathematical calculation and return single values. This can be calculated from the columns in a table. Scalar functions return a single value based on the input value.

Example -.

Aggregate – max(), count - Calculated with respect to numeric.

Scalar – UCASE(), NOW() – Calculated with respect to strings.

# **45. How can you create an empty table from an existing table?**

Example will be -.

Select \* into studentcopy from student where 1=2

Here, we are copying student table to another table with the same structure with no rows copied.

# **46. How to fetch common records from two tables?**

Common records result set can be achieved by -.

Select studentID from student INTERSECT Select StudentID from Exam

# **47. How to fetch alternate records from a table?**

Records can be fetched for both Odd and Even row numbers -.

To display even numbers-.

Select studentId from (Select rowno, studentId from student) where mod(rowno,2)=0

To display odd numbers-.

Select studentId from (Select rowno, studentId from student) where mod(rowno,2)=1

from (Select rowno, studentId from student) where m**o**d(rowno,2)=1.[/sql]

# **48. How to select unique records from a table?**

Select unique records from a table by using DISTINCT keyword.

Select DISTINCT StudentID, StudentName from Student.

# **49. What is the command used to fetch first 5 characters of the string?**

There are many ways to fetch first 5 characters of the string -.

Select SUBSTRING(StudentName,1,5) as studentname from student

Select LEFT(Studentname,5) as studentname from student

# **50. Which operator is used in query for pattern matching?**

LIKE operator is used for pattern matching, and it can be used as -.

1. % - Matches zero or more characters.
2. \_(Underscore) – Matching exactly one character.

**Example -.**

Select \* from Student where studentname like 'a%'

Select \* from Student where studentname like 'ami\_'

## Advance Differences between Stored Procedure and Function in SQL Server

1. The procedure allows SELECT as well as DML(INSERT/UPDATE/DELETE) statement in it whereas Function allows only SELECT statement in it.
2. Procedures cannot be utilized in a SELECT statement whereas Function can be embedded in a SELECT statement.
3. Stored Procedures cannot be used in the [SQL](https://en.wikipedia.org/wiki/SQL) statements anywhere in the WHERE/HAVING/SELECT section whereas Function can be.
4. Functions that return tables can be treated as another rowset. This can be used in JOINs with other tables.
5. Inline Function can be though of as views that take parameters and can be used in JOINs and other Rowset operations.
6. An exception can be handled by try-catch block in a Procedure whereas try-catch block cannot be used in a Function.
7. We can use Transactions in Procedure whereas we can't use Transactions in Function.

# **1. What are the two authentication modes in SQL Server?**

There are two authentication modes –

* Windows Mode
* Mixed Mode

Modes can be changed by selecting the tools menu of SQL Server configuration properties and choose security page.

# **2. What Is SQL Profiler?**

SQL Profiler is a tool which allows system administrator to monitor events in the SQL server. This is mainly used to capture and save data about each event of a file or a table for analysis.

# **3. What is recursive stored procedure?**

SQL Server supports recursive stored procedure which calls by itself. Recursive stored procedure can be defined as a method of problem solving wherein the solution is arrived repetitively. It can nest up to 32 levels.

CREATE PROCEDURE [dbo].[Fact]

(

@Number Integer,

@RetVal Integer OUTPUT

)

AS

DECLARE @In Integer

DECLARE @Out Integer

IF @Number != 1

BEGIN

SELECT @In = @Number – 1

EXEC Fact @In, @Out OUTPUT - Same stored procedure has been called again(Recursively)

SELECT @RetVal = @Number \* @Out

END

ELSE

BEGIN

SELECT @RetVal = 1

END

RETURN

GO

# **4. What are the differences between local and global temporary tables?**

* Local temporary tables are visible when there is a connection, and are deleted when the connection is closed.

CREATE TABLE #<tablename>

* Global temporary tables are visible to all users, and are deleted when the connection that created it is closed.

CREATE TABLE ##<tablename>

# **5. What is CHECK constraint?**

A CHECK constraint can be applied to a column in a table to limit the values that can be placed in a column. Check constraint is to enforce integrity.

# **6. Can SQL servers linked to other servers?**

SQL server can be connected to any database which has OLE-DB provider to give a link. Example: Oracle has OLE-DB provider which has link to connect with the SQL server group.

# **7. 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

# **8. What are the types of sub query?**

There are three types of sub query –

* Single row sub query which returns only one row
* Multiple row sub query which returns multiple rows
* Multiple column sub query which returns multiple columns to the main query. With that sub query result, Main query will be executed.

# **9. What is SQL server agent?**

The SQL Server agent plays a vital role in day to day tasks of SQL server administrator(DBA). Server agent's purpose is to implement the tasks easily with the scheduler engine which allows our jobs to run at scheduled date and time.

# **10. What are scheduled tasks in SQL Server?**

Scheduled tasks or jobs are used to automate processes that can be run on a scheduled time at a regular interval. This scheduling of tasks helps to reduce human intervention during night time and feed can be done at a particular time. User can also order the tasks in which it has to be generated.

# **11. What is COALESCE in SQL Server?**

COALESCE is used to return first non-null expression within the arguments. This function is used to return a non-null from more than one column in the arguments.

Example –

Select COALESCE(empno, empname, salary) from employee;

# **12. How exceptions can be handled in SQL Server Programming?**

Exceptions are handled using TRY----CATCH constructs and it is handles by writing scripts inside the TRY block and error handling in the CATCH block.

# **13. What is the purpose of FLOOR function?**

FLOOR function is used to round up a non-integer value to the previous least integer. Example is given

FLOOR(6.7)

Returns 6.

# **14. Can we check locks in database? If so, how can we do this lock check?**

Yes, we can check locks in the database. It can be achieved by using in-built stored procedure called sp\_lock.

# **15. What is the use of SIGN function?**

SIGN function is used to determine whether the number specified is Positive, Negative and Zero. This will return +1,-1 or 0.

Example –

SIGN(-35) returns -1

# **16. 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.

# **17. What are the types of Triggers?**

There are four types of triggers and they are:

* Insert
* Delete
* Update
* Instead of

# **18. 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.

# **19. What is Bulkcopy in SQL?**

Bulkcopy is a tool used to copy large amount of data from Tables. This tool is used to load large amount of data in SQL Server.

# **20. What will be query used to get the list of triggers in a database?**

Query to get the list of triggers in database-

Select \* from sys.objects where type='tr'

# **21. 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.

# **22. 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.

# **23. What are the differences between Stored Procedure and the dynamic SQL?**

Stored Procedure is a set of statements which is stored in a compiled form. Dynamic SQL is a set of statements that dynamically constructed at runtime and it will not be stored in a Database and it simply execute during run time.

# **24. What is Collation?**

Collation is defined to specify the sort order in a table. There are three types of sort order –

1. Case sensitive
2. Case Insensitive
3. Binary

# **25. How can we get count of the number of records in a table?**

Following are the queries can be used to get the count of records in a table -

Select \* from <tablename> Select count(\*) from <tablename> Select rows from sysindexes where id=OBJECT\_ID(tablename) and indid<2

# **26. What is the command used to get the version of SQL Server?**

Select SERVERPROPERTY('productversion')

is used to get the version of SQL Server.

# **27. What is UPDATE\_STATISTICS command?**

UPDATE\_STATISTICS command is used to update the indexes on the tables when there is a large amount of deletions or modifications or bulk copy occurred in indexes.

# **28. What is the use of SET NOCOUNT ON/OFF statement?**

By default, NOCOUNT is set to OFF and it returns number of records got affected whenever the command is getting executed. If the user doesn't want to display the number of records affected, it can be explicitly set to ON- (SET NOCOUNT ON).

# **29. Which SQL server table is used to hold the stored procedure scripts?**

Sys.SQL\_Modules is a SQL Server table used to store the script of stored procedure. Name of the stored procedure is saved in the table called Sys.Procedures.

# **30. What are Magic Tables in SQL Server?**

During DML operations like Insert, Delete, and Update, SQL Server creates magic tables to hold the values during the DML operations. These magic tables are used inside the triggers for data transaction.

# **31. What is the difference between SUBSTR and CHARINDEX in the SQL Server?**

The SUBSTR function is used to return specific portion of string in a given string. But, CHARINDEX function gives character position in a given specified string.

SUBSTRING('Smiley',1,3)

Gives result as Smi

CHARINDEX('i', 'Smiley',1)

Gives 3 as result as I appears in 3rd position of the string

# **32. How can you create a login?**

You can use the following command to create a login

CREATE LOGIN MyLogin WITH PASSWORD = '123';

# **33. What is ISNULL() operator?**

ISNULL function is used to check whether value given is NULL or not NULL in sql server. This function also provides to replace a value with the NULL.

# **34. What is the use of FOR Clause?**

FOR clause is mainly used for XML and browser options. This clause is mainly used to display the query results in XML format or in browser.

# **35. What will be the maximum number of index per table?**

For SQL Server 2008 100 Index can be used as maximum number per table. 1 Clustered Index and 999 Non-clustered indexes per table can be used in SQL Server.

1000 Index can be used as maximum number per table. 1 Clustered Index and 999 Non-clustered indexes per table can be used in SQL Server.

1 Clustered Index and 999 Non-clustered indexes per table can be used in SQL Server.

# **36. What is the difference between COMMIT and ROLLBACK?**

Every statement between BEGIN and COMMIT becomes persistent to database when the COMMIT is executed. Every statement between BEGIN and ROOLBACK are reverted to the state when the ROLLBACK was executed.

# **37. What is the difference between varchar and nvarchar types?**

Varchar and nvarchar are same but the only difference is that nvarhcar can be used to store Unicode characters for multiple languages and it also takes more space when compared with varchar.

# **38. What is the use of @@SPID?**

A @@SPID returns the session ID of the current user process.

# **39. What is the command used to Recompile the stored procedure at run time?**

Stored Procedure can be executed with the help of keyword called RECOMPILE.

Example

Exe <SPName> WITH RECOMPILE

Or we can include WITHRECOMPILE in the stored procedure itself.

# **40. How to delete duplicate rows in SQL Server?**

Duplicate rows can be deleted using CTE and ROW NUMER feature of SQL Server.

# **41. Where are SQL Server user names and passwords stored in SQL Server?**

User Names and Passwords are stored in sys.server\_principals and sys.sql\_logins. But passwords are not stored in normal text.

# **42. What is the difference between GETDATE and SYSDATETIME?**

Both are same but GETDATE can give time till milliseconds and SYSDATETIME can give precision till nanoseconds. SYSDATE TIME is more accurate than GETDATE.

# **43. 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.

# **44. What is TABLESAMPLE?**

TABLESAMPLE is used to extract sample of rows randomly that are all necessary for the application. The sample rows taken are based on the percentage of rows.

# **45. Which command is used for user defined error messages?**

RAISEERROR is the command used to generate and initiates error processing for a given session. Those user defined messages are stored in sys.messages table.

# **46. What do mean by XML Datatype?**

XML data type is used to store XML documents in the SQL Server database. Columns and variables are created and store XML instances in the database.

# **47. What is CDC?**

CDC is abbreviated as Change Data Capture which is used to capture the data that has been changed recently. This feature is present in SQL Server 2008.

# **48. What is SQL injection?**

SQL injection is an attack by malicious users in which malicious code can be inserted into strings that can be passed to an instance of SQL server for parsing and execution. All statements have to checked for vulnerabilities as it executes all syntactically valid queries that it receives.

Even parameters can be manipulated by the skilled and experienced attackers.

# **49. What are the methods used to protect against SQL injection attack?**

Following are the methods used to protect against SQL injection attack:

* Use Parameters for Stored Procedures
* Filtering input parameters
* Use Parameter collection with Dynamic SQL
* In like clause, user escape characters

# **50. What is Filtered Index?**

Filtered Index is used to filter some portion of rows in a table to improve query performance, index maintenance and reduces index storage costs. When the index is created with WHERE clause, then it is called Filtered Index