**MODULE 3 [ MVC .NET Functions]**

1. **What is C#?**

* C# is a simple & powerful object-oriented programming language developed by Microsoft.
* C# can be used to create various types of applications, such as web, windows, console applications or other types of applications using Visual studio.

1. **Can we use keywords as an identifier? Why?**

* Keywords are reserved words in a programming language that have a predefined meaning and are used to perform specific tasks or operations.
* Keywords cannot be used as identifiers in a program because they have a special meaning and are reserved for a particular purpose. If you try to use a keyword as an identifier, the compiler or interpreter will raise a syntax error because the keyword is not a valid name for a variable, function, or other identifiers.

1. **Explain any 5 string operation methods**
2. **ToUpper() :-** ToUpper function converts string to upper case. It is return value in string.
3. **ToLower() :-** ToLower function converts string to Lower case. It is return value in string.
4. **Clone() :-**  making of an exact copy of an object. It return value in Object.
5. **Copy() :-** Creates a new instance of String with the same value as a specified String. It is return value in string.
6. **CompareTo() :-**  Compare two strings and returns integer value as output. It returns 0 for true and 1 for false.
7. **What do you mean by loop variable?**

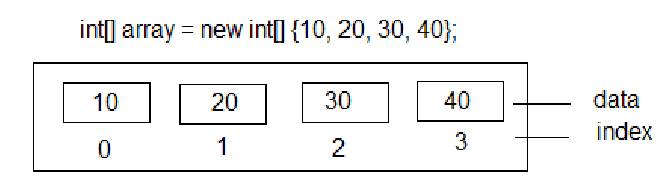
* The loop variable defines the loop index value for each iteration. You set it in the first line of a statement.
* For values across all iterations, the loop variable must evaluate to ascending consecutive integers. Each iteration is independent of all others, and each has its own loop index value.

1. **What do you mean by integration?**

* Integration tests ensure that an app's components function correctly at a level that includes the app's supporting infrastructure, such as the database, file system, and network.

1. **What is Array?**

* An array is a special type of data type which can store fixed number of values sequentially.



* Index is a number starting from 0, which stores the value.
* You can store a fixed number of values in an array. Array index will be increased by 1

sequentially till the maximum specified array size.

1. **What is jagged array? Explain with example**

* A jagged array is an array of an array. Jagged arrays store arrays instead of any other data type value directly.
* A jagged array is initialized with two square brackets [][].
* The first bracket specifies the size of an array and the second bracket specifies the dimension of the array which is going to be stored as values.
* int[][] a = new int[3][];

a[0] = new int[2]{4, 5};

a[1] = new int[3]{11, 2, 8 };

a[2] = new int[2]{7,9};

1. **How can we manage runtime errors?**

* To deal with runtime errors, you'll need to trap (catch) the errors, handle them, and then resume execution after the error is handled:
* Trapping Runtime Errors
* Handling Errors Inline
* Using Error Handling Routines

1. **What is abstract class?**

* Abstract classes contain abstract methods, which are implemented by the derived class.
* Following some rules for abstract class:-

• Can not create instance of abstract class.

• you cannot declare an abstract method outside an abstract class

• When a class is declared sealed, it cannot be inherited, abstract classes cannot be declared sealed.

1. **What is thread?**

* Threads in .NET are the basic unit of execution within a process.
* When a new application starts on Windows, it creates a process for the application with a process id and some resources are allocated to this new process.
* Every process contains at least one primary thread which takes care of the entry point of the application execution.
* A single thread can have only one path of execution but as mentioned earlier, sometimes you may need multiple paths of execution and that is where threads play a role.
* In .NET Core, the common language runtime (CLR) plays a major role in creating and managing

threads lifecycle.

* In a new .NET Core application, the CLR creates a single foreground thread to

execute application code via the Main method.

* A C# program is single threaded by design.
* That means, only one path of the code is executed at a time by the main or primary thread

1. **What is DLL?**

* A **DLL** is a library that contains code and data that can be used by more than one program at the same time.
* By using a DLL, a program can be modularized into separate components.
* Additionally, updates are easier to apply to each module without affecting other parts of the program.

1. **What is namespace?**

* A namespace is designed for providing a way to keep one set of names separate from another.
* The class names declared in one namespace does not conflict with the same class names declared in another.
* Collection of classes called namespace.
* In C#, every class belongs to a namespace and the namespace needs to be referenced or imported to use the class.
* The using keyword states that the program is using the names in the given namespace.
* For example, we are using the System namespace in our programs.

1. **What is difference between else if ladder and switch case. What will occur if we not write break statement in switch case?**

* In **else if ladder**, the control goes through the every else if statement until it finds true value of the statement or it comes to the end of the else if ladder. In case of **switch** case, as per the value of the switch, the control jumps to the corresponding case.
* You can use the break statement to end processing of a particular labeled statement within the switch statement. It branches to the end of the switch statement. **Without break**, the program continues to the next labeled statement, executing the statements until a break or the end of the statement is reached. This continuation may be desirable in some situations.

1. **What is difference between entry loop and exit loop? Explain with example**

* **Entry loop :** A condition is checked before executing the loop. It is also called as a pre-checking loop.
* **For Loops :** It is a repetition control structure that allows you to efficiently write A loop that needs to execute a specific number of times.
* **While Loops :** It repeatedly executes a target statement as long as the Given condition is true
* **Exit loop :** A condition is checked after executing the loop. It is also called as a post-checking loop.
* **Do-while Loop :** Do-while loop is similar to while loop , except the fact that it Will execute once even if condition is false.

1. **What do you mean by multi-dimension array?**

* An array is the collection of similar objects stored in a contiguous memory location. The dimension of an array determines the number of arrays present in an array. Multi-dimensional arrays store data in tabular form.
* In a multi-dimensional array, the data arranged is in the form of rows and columns or many rows and columns.
* The size of the array determines the dimension of an array. For example, a two-dimensional array would include two sizes that would be arranged in the form of a table. Each element in an array has a unique index that determines its position within the array.
* Two-dimensional arrays, three-dimensional arrays, four-dimensional arrays are all multi-dimensional arrays.

1. **Explain 5 method of array class with example**
2. **GetLength(int dimension) :** Returns the number of elements in the specified dimension.
3. **GetLowerBound(int dimension) :** Returns the lowest index of the specified dimension.
4. **GetUpperBound(int dimension) :** Returns the highest index of the specified dimension.
5. **GetValue(int index) :** Returns the value at the specified index.
6. **Sort(int arr) :** Sort the Array
7. **What is difference between for loop and foreach loop?**

* **for loop :** Executes a sequence of statements multiple times and abbreviates the code that manages the loop variable.
* **Syntax:**

for(Initialization; Condition; Increment/Decrement)

{

Loop statements until the condition is true loop will execute

}

* **foreach loop :** The foreach statement is a collection of items such as an array or list, The foreach body must be enclosed in {} braces unless it consists of a single statement
* **Syntax:**

foreach(variable in collection)

{

Loop statements until the condition is true loop will execute

}

1. **What is dictionary? Advantages of Dictionary?**

* **Dictionary** is a collection of keys and values in C#. Same English dictionary.
* English dictionary is a collection of words and their definitions, often listed alphabetically in one or more specific languages.
* In the same way, the Dictionary in C# is a collection of Keys and Values, where key is like word and value is like definition.
* Dictionary cannot include duplicate or null keys, where as values can be duplicated or set as null. Keys must be unique otherwise it will throw a runtime exception.
* **Advantages :**
* They are very efficient for accessing values by their keys.
* They can be used to store a large number of key-value pairs.
* They are easy to use and manage.

1. **What is multithread?**

* **Multithread** is a programming concept in which the application can create a small unit of tasks to execute in parallel. If you are working on a computer, it runs multiple applications and allocates processing power to them. A simple program runs in sequence and the code statements execute one by one. This is a single-threaded application. But, if the programming language supports creating multiple threads and passes them to the operating system to run in parallel, it’s called multithread.

1. **How to prevent class to be instantiate?**

* You can prevent instantiation by hiding the constructor, and raising an exception to prevent instantiation via reflection.

1. **What is mutable and immutable string?**

* **A mutable** string can be changed, and **an immutable** string cannot be changed.

1. **What is difference between array and list?**

* **An array** is a data structure that stores a fixed-size collection of elements of the same type. Arrays are indexed by a integer value, and the elements of an array are stored contiguously in memory.
* **A list** is a data structure that stores an ordered collection of elements, and the elements of a list can be of different types. Lists are typically implemented using a dynamic array or a linked list, and they are indexed by an integer value. Lists provide more flexibility than arrays because they can grow or shrink in size and they can store elements of different types.

1. **What are generics? Explain with example**

* Generics allow you to define a class with placeholders for the type of its fields, methods,

parameters, etc.

* Permits classes,structs,interfaces,delegates,and methods to be parameterized by the types of data they store and manipulate.
* Generics replace these placeholders with some specific type at compile time.
* A generic class can be defined using angle brackets <>
* Generics in C# and .NET procedure many of the benefits of strongly-typed collections as well as provide a higher quality of and a performance boost for code
* The System.Collection.Generic namespace also defines a number of classes that implement many of these key interfaces.
* Generics are useful because they provide stronger compile-time typechecking,require fewer explicit conversions between datatypes, and reduce the need for boxing operations and run-time type checks.

1. **What is use of method overriding?**

* Method overriding is used to provide the specific implementation of a method which is already provided by its superclass(parent class).
* Method overriding is used for runtime polymorphism

1. **Write a program to get 10 Employee details including name, salary, department and show name and designation whose salary is highest.**

* insert into tbl\_emp values('Neena',24000,'Administration'),

('Riya',17000,'Marketing'),

('Shivanee',25000,'Purchasing'),

('Nency',20000,'Shipping'),

('Urvashi',18000,'IT'),

('Darpan',30000,'Sales'),

('Krupa',25000,'Executive'),

('Akshay',20000,'Accounting'),

('Harsh',35000,'Benefits'),

('Khushbu',15000,'Operations')

* select \* from tbl\_emp
* select emp\_name,department from tbl\_emp where emp\_salary = (select MAX(emp\_salary) from tbl\_emp)

1. **Differentiate explicit and implicit conversation.**

* **An implicit conversion** does not require any special syntax in the source code. In the following example, implicitly converts the value of k to a single-precision floating-point value before assigning it to q.
* k = 432

q = k

* **An explicit conversion** uses a type conversion keyword. Visual Basic provides several such keywords, which coerce an expression in parentheses to the desired data type. These keywords act like functions, but the compiler generates the code inline, so execution is slightly faster than with a function call.
* In the following extension of the preceding example, the Int keyword converts the value of q back to an integer before assigning it to k.
* ' q had been assigned the value 432 from k.

q = Math.Sqrt(q)

k = Int(q)

' k now has the value 21 (rounded square root of 432).