Basic Interview Question and Answer

What is c#?

C# is an object oriented, type safe and managed language that is compiled by .Net framework to generate Microsoft Intermediate Language.

What is the difference between constant and read-only variables in C#?

Const keyword is used for making an entity constant. We cannot modify the value later in the code. Value assigning is mandatory to constant variables.

Read-only variable value can be changed during runtime and value to read-only variables can be assigned in the constructor or at the time of declaration.

What is the difference between ref & out parameters?

An argument passed as ref must be initialized before passing to the method whereas out parameter needs not to be initialized before passing to a method.

What is yield?

The yield keyword performs custom and stateful iteration and returns each element of a collection one at a time without the need of creating temporary collections

What is serialization?

The process of converting an object into a stream of bytes is called Serialization. We use Serialization to transport an object through network.

What is deserialization?

The process of converting a stream of bytes into an object is called deserialization. Deserialization is used to recover the objects from the file.

What is boxing and unboxing in c#?

The process of converting value type into object type is called boxing. Similarly the process of converting object type into value type is called unboxing.

```
int i = 123;
// The following line boxes i.

object o = i;

o = 123;
i = (int)o;  // unboxing
```

What are indexers in C# .NET?

Indexers are known as smart arrays in C#. It allows the instances of a class to be indexed in the same way as array.

Can "this" be used within a static method?

We can't use 'This' in a static method because we can only use static variables/methods in a static method.

Can a private virtual method be overridden?

No, because they are not accessible outside the class.

How can we sort the elements of the array in descending order?

Using Sort() methods followed by Reverse() method.

```
using System;
using System.Linq;

namespace IntroductionToDelegate
{
    class MultiCastDelegate
    {
        static void Main()
        {
            int[] Numbers = new int[10] {50,20,10,60,70,80,90,30,40,100};

            Array.Sort(Numbers);
            Array.Reverse(Numbers);

            foreach (var item in Numbers)
            {
                Console.WriteLine("Sorted Array:{0}",item);
            }
        }
    }
}
```

What is constructor?

A constructor is a special method that is used to initialize an object. Constructor is invoked at the time of object creation. Constructor name must be same as its class name. Constructor must have no explicit return type.

What is Destructor?

A Destructor is automatically invoked when an object is finally destroyed

Explain “static” keyword in C#?

“Static” keyword can be used for declaring a static member. If the class is made static then all the members of the class are also made static. If the variable is made static then it will have a single instance and the value change is updated in this instance.

What are the different ways a method can be overloaded?

Methods can be overloaded using different data types for parameter, different order of parameters, and different number of parameters

What are generics in C#?

Generics are used to make reusable code classes to decrease the code redundancy, increase type safety and performance. Using generics, we can create collection classes. To create generic collection, System.Collections.Generic namespace should be used instead of classes such as ArrayList in the System.Collections namespace. Generics promotes the usage of parameterized types

What is an object pool in .NET?

An object pool is a container having objects ready to be used. It tracks the object that is currently in use, total number of objects in the pool. This reduces the overhead of creating and re-creating objects.

What is difference between is and as operators in c#?

"is" operator is used to check the compatibility of an object with a given type and it returns the result as Boolean.

What is difference between the "throw" and "throw ex" in .NET?

"Throw" statement preserves original error stack whereas "throw ex" have the stack trace from their throw point. It is always advised to use "throw" because it provides more accurate error information.

What's a multicast delegate?

A delegate which call multiple methods. + (pulse) and – (minus) operator use to subscribe and unsubscribe. A Multicast delegate is a delegate that has references to more than one function. When you invoke a multicast delegate, all the functions the delegate is pointing to, are invoked.

How to use nullable types in .Net?

Value types can take either their normal values or a null value. Such types are called nullable types.

What are value types and reference types?

Value types are stored in the Stack whereas reference types stored on heap.

Value types: int, enum, byte, decimal, double, float, long.

Reference Types: string, class, interface, object.

What is the difference between a Struct and a Class?

Class	Struct
Supports Inheritance	Does not support Inheritance
Class is Pass by reference (reference type)	Struct is Pass by Copy (Value type)
Members are private by default	Members are public by default
Good for larger complex objects	Good for Small isolated models
Can use waste collector for memory management	Cannot use Garbage collector and hence no Memory management

What is the difference between Continue and Break Statement?

Break statement breaks the loop. It makes the control of the program to exit the loop.

Continue statement makes the control of the program to exit only the current iteration. It does not break the loop.

What is the difference between Virtual method and Abstract method?

A Virtual method must always have a default implementation. However, it can be overridden in the derived class, though not mandatory. It can be overridden using override keyword.

An Abstract method does not have an implementation. It resides in the abstract class. It is mandatory that the derived class implements the abstract method. An override keyword is not necessary here though it can be used

What is difference between the "throw" and "throw ex" in .NET?

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What is Lambda expression?

A lambda expression is a block of code (an expression or a statement block) that is treated as an object. It can be passed as an argument to methods, and it can also be returned by method calls.

What are type of operators in c#?

1. Basic Assignment Operator
2. Arithmetic Operators
3. Relational Operators
4. Logical Operators
5. Unary Operators
6. Ternary Operator
7. Bitwise and Bit Shift Operators
8. Compound Assignment Operators

What are the variable in c#?

There are three main type of variable in c#

1. **Value type**: Value type variables can be assigned a value directly. Derived from the class System.ValueType. int, char, and float, which stores numbers, alphabets, and floating point numbers, respectively.
2. **Reference type**: The reference types do not contain the actual data stored in a variable, but they contain a reference to the variables. Ex-built-in reference types are: object, dynamic, and string.
3. **Pointer type**: Pointer type variables store the memory address of another type.

Can abstract class have constructors in C#?

Yes, abstract class can have constructor in C#.

Can abstract class be sealed in C#?

An abstract class cannot be a sealed class because the sealed modifier prevents a class from being inherited and the abstract modifier requires a class to be inherited.

Can we declare abstract methods as private in C#?

No. Abstract methods cannot be private in C#.

Can abstract class have static methods in C#?

Yes, Abstract class can have static methods in C#

Can abstract class contain main method in C#?

Yes, Abstract class can contain main method in C#.

Does Abstract class support multiple Inheritance?

No, Abstract class does not support multiple Inheritance.

When to use Abstract class in C#?

If various implementations are of the same kind and use common behavior or status then abstract class is better to use.

Can Interface inherit another interface?

Yes

Can Interface inherit another class?

Interface cannot inherit another class.

Can you create an instance of an interface?

No, you cannot create an instance of an interface.

What are the advantages of using interfaces?

1. Interfaces facilitate parallel application development.
2. They are great for implementing Inversion of Control or Dependency Injection.
3. Interfaces enable mocking for better unit testing.
4. Interfaces allow us to develop very loosely coupled systems.
5. Interfaces also allow us to implement polymorphic behavior.

What are the difference between interfaces and abstract classes?

1. Abstract classes can have implementations for some of its members, but the interface can’t have implementation for any of its members.
2. Interfaces cannot have fields where as an abstract class can have fields.
3. An interface can inherit from another interface only and cannot inherit from any class; where as an abstract class can inherit from another class or another interface.
4. A class can inherit from multiple interfaces at the same time (**In this situation C# supports multiple inheritance**), where as a class cannot inherit from multiple classes at the same time.
5. Abstract class members can have access modifiers whereas interface members cannot have access modifiers.

What are the uses of delegates?

There are two basic uses of delegates:-

- Callbacks / events.
- Method and function abstraction.

Can a class implement interface with same method name in C#

Yes

```
using System;
namespace InterviewQuetions
{
    interface IOne
    {
        void MethodOne();
    }
    interface ITwo
    {
        void MethodOne();
    }
    class A : IOne, ITwo
    {
        void IOne.MethodOne()
        {
            Console.WriteLine("Interface One method");
        }

        void ITwo.MethodOne()
        {
            Console.WriteLine("Interface Two method");
        }
    }
    class Program
    {
        static void Main(string[] args)
        {
            IOne objOne = new A();
            objOne.MethodOne();

            ITwo objTwo = new A();
            objTwo.MethodOne();
            Console.ReadLine();
        }
    }
}
```

What is a point of a pointer when we can invoke the actual function/method?

Many times rather than pointing to actual methods, we would like to point to abstraction. For example rather than pointing to “Add(int, int)” , “Subtract(int, int)” , we create an abstract delegate pointer “Operation(int, int)” and point to any of them above.

What are events?

Events are encapsulation over delegates.

What are multi-cast delegates?

If we want one delegate to point to multiple methods / function we use multicast delegates.

What are the different ways of creating a delegate in C#?

1. Func
2. Predicate
3. Lambda
4. Anonymous types

Difference between Array and ArrayList in C#

Array	ArrayList
Array is strongly typed. This means that an array can store only specific type of items\elements.	ArrayList can store any type of items\elements.
Array stores fixed number of elements. Size of an Array must be specified at the time of initialization.	ArrayList grows automatically and you don't need to specify size.
No need to cast elements of an array while retrieving because it is strongly type and stores specific type of items only.	Items of ArrayList need to be cast to appropriate data type while retrieving.
Use static helper class Array to perform different tasks on the array.	ArrayList itself includes various utility methods for various tasks

What are Jagged Arrays in C#?

A jagged array is an array of arrays.

What is ArrayList?

ArrayList is a non-generic type of collection in C#. It can contain elements of any data types. It is similar to an array, except that it grows automatically as you add items in it.

What is collection?

Collection classes are specialized classes for data storage and retrieval. These classes provide support for stacks, queues, lists, and hash tables.

What is namespace in C#?

A namespace is collection of classes, methods, structure interface etc.

What are the uses of using statement in c#?

1. As a directive, when it is used to create an alias for a namespace or to import types defined in other namespaces.
2. As a statement, when it defines a scope at the end of which an object will be disposed.

What are the two uses of a ‘using’ statement in c#?

1. To import a namespace.
2. To close a connection properly. The connection is automatically closed at the end of ‘using’ block.

What is exception in c#?

An exception is a problem that arises during the execution of a program. A C# exception is a response to an exceptional circumstance that arises while a program is running, such as an attempt to divide by zero.

- **try** − A try block identifies a block of code for which particular exceptions is activated. It is followed by one or more catch blocks.
- **catch** − A program catches an exception with an exception handler at the place in a program where you want to handle the problem. The catch keyword indicates the catching of an exception.
- **finally** − The finally block is used to execute a given set of statements, whether an exception is thrown or not thrown. For example, if you open a file, it must be closed whether an exception is raised or not.
- **throw** − A program throws an exception when a problem shows up. This is done using a throw keyword.

What is differences between System.String and System.Text.StringBuilder?

System.String is immutable. When we modify the value of a string variable then a new memory is allocated to the new value and the previous memory allocation released.

System.Text.StringBuilder was designed to have concept of a mutable string where a variety of operations can be performed without allocation separate memory location for the modified string.

What is difference between System.Array.CopyTo() and System.Array.Clone()?

using CopyTo() method, all the elements of existing array copies into another existing array. Both the methods perform a shallow copy.

Using Clone() method, we creates a new array object containing all the elements in the original array.