C# Interview Questions:

1. **What is a static method?**

A static function, unlike a regular (*instance*) function, is not associated with an instance of the class.

A static class is a class which can only contain static members, and therefore cannot be instantiated.

For example:

class SomeClass {

public int InstanceMethod() { return 1; }

public static int StaticMethod() { return 42; }

}

In order to call InstanceMethod, you need an instance of the class:

SomeClass instance = new SomeClass();

instance.InstanceMethod(); //Fine

instance.StaticMethod(); //Won't compile

SomeClass.InstanceMethod(); //Won't compile

SomeClass.StaticMethod(); //Fine

1. **What is the new operator?**

The new operator creates an instance of an object.

1. **What is the ‘this’ keyword?**

The ‘this’ keyword is a reference to the current object.

1. **What does immutable mean?**

Mutable can be changed, Immutable can’t be changed. String is standard Immutable, StringBuilder is mutable string type.

1. Array vs ArrayList vs List

An Array (System.Array) is fixed in size once it is allocated. You can't add items to it or remove items from it. Also, all the elements must be the same type. As a result, it is type safe, and is also the most efficient of the three, both in terms of memory and performance. Also, System.Array supports multiple dimensions (i.e. it has a [Rank](https://msdn.microsoft.com/en-us/library/system.array.rank(v=vs.110).aspx) property) while List and ArrayList do not (although you can create a List of Lists or an ArrayList of ArrayLists, if you want to).

An ArrayList is a flexible array which contains a list of objects. You can add and remove items from it and it automatically deals with allocating space. If you store value types in it, they are boxed and unboxed, which can be a bit inefficient. Also, it is not type-safe.

A List<> leverages generics; it is essentially a type-safe version of ArrayList. This means there is no boxing or unboxing (which improves performance) and if you attempt to add an item of the wrong type it'll generate a compile-time error.