### Problem 1. Strings in C#.

The **string** type represents a sequence of zero or more Unicode characters. **string** is an alias for [String](https://msdn.microsoft.com/en-us/library/system.string.aspx) in the .NET Framework. Although **string** is a reference type, the equality operators (**==** and **!=**) are defined to compare the values of **string** objects, not references. This makes testing for string equality more intuitive. Strings are *immutable*--the contents of a string object cannot be changed after the object is created, although the syntax makes it appear as if you can do this. For example, when you write this code, the compiler actually creates a new string object to hold the new sequence of characters, and that new object is assigned to b. The string "h" is then eligible for garbage collection. The [] operator can be used for readonly access to individual characters of a **string**:

String literals are of type **string** and can be written in two forms, quoted and @-quoted. Quoted string literals are enclosed in double quotation marks ("):

C#

"good morning" // a string literal

String literals can contain any character literal. Escape sequences are included. The following example uses escape sequence \\ for backslash, \u0066 for the letter f, and \n for newline.

Methods:

|  |  |
| --- | --- |
| [Clone](https://msdn.microsoft.com/en-us/library/system.string.clone(v=vs.110).aspx) | Returns a reference to this instance of [String](https://msdn.microsoft.com/en-us/library/system.string(v=vs.110).aspx). |
| [Compare(String, String)](https://msdn.microsoft.com/en-us/library/84787k22(v=vs.110).aspx) | Compares two specified [String](https://msdn.microsoft.com/en-us/library/system.string(v=vs.110).aspx) objects and returns an integer that indicates their relative position in the sort order. |
| [Compare(String, String, Boolean)](https://msdn.microsoft.com/en-us/library/zkcaxw5y(v=vs.110).aspx) | Compares two specified [String](https://msdn.microsoft.com/en-us/library/system.string(v=vs.110).aspx) objects, ignoring or honoring their case, and returns an integer that indicates their relative position in the sort order. |
| [CompareTo(String)](https://msdn.microsoft.com/en-us/library/35f0x18w(v=vs.110).aspx) | Compares this instance with a specified [String](https://msdn.microsoft.com/en-us/library/system.string(v=vs.110).aspx) object and indicates whether this instance precedes, follows, or appears in the same position in the sort order as the specified string. |
| [Concat(Object)](https://msdn.microsoft.com/en-us/library/khca9w90(v=vs.110).aspx) | Creates the string representation of a specified object. |
| [Contains](https://msdn.microsoft.com/en-us/library/dy85x1sa(v=vs.110).aspx) | Returns a value indicating whether a specified substring occurs within this string. |
| [Copy](https://msdn.microsoft.com/en-us/library/system.string.copy(v=vs.110).aspx) | Creates a new instance of [String](https://msdn.microsoft.com/en-us/library/system.string(v=vs.110).aspx) with the same value as a specified [String](https://msdn.microsoft.com/en-us/library/system.string(v=vs.110).aspx). |
| [Equals(Object)](https://msdn.microsoft.com/en-us/library/fkfd9eh8(v=vs.110).aspx) | Determines whether this instance and a specified object, which must also be a [String](https://msdn.microsoft.com/en-us/library/system.string(v=vs.110).aspx) object, have the same value.(Overrides [Object.Equals(Object)](https://msdn.microsoft.com/en-us/library/bsc2ak47(v=vs.110).aspx).) |
| [Format(String, Object)](https://msdn.microsoft.com/en-us/library/fht0f5be(v=vs.110).aspx) | Replaces one or more format items in a specified string with the string representation of a specified object. |
| [GetType](https://msdn.microsoft.com/en-us/library/system.object.gettype(v=vs.110).aspx) | Gets the [Type](https://msdn.microsoft.com/en-us/library/system.type(v=vs.110).aspx) of the current instance. (Inherited from [Object](https://msdn.microsoft.com/en-us/library/system.object(v=vs.110).aspx).) |
| [IndexOf(Char)](https://msdn.microsoft.com/en-us/library/kwb0bwyd(v=vs.110).aspx) | Reports the zero-based index of the first occurrence of the specified Unicode character in this string. |
| [IsNullOrEmpty](https://msdn.microsoft.com/en-us/library/system.string.isnullorempty(v=vs.110).aspx) | Indicates whether the specified string is null or an [Empty](https://msdn.microsoft.com/en-us/library/system.string.empty(v=vs.110).aspx) string. |
| [Join(String, String[])](https://msdn.microsoft.com/en-us/library/57a79xd0(v=vs.110).aspx) | Concatenates all the elements of a string array, using the specified separator between each element. |
| [PadLeft(Int32)](https://msdn.microsoft.com/en-us/library/0zk6ydzx(v=vs.110).aspx) | Returns a new string that right-aligns the characters in this instance by padding them with spaces on the left, for a specified total length. |
| [Remove(Int32)](https://msdn.microsoft.com/en-us/library/9ad138yc(v=vs.110).aspx) | Returns a new string in which all the characters in the current instance, beginning at a specified position and continuing through the last position, have been deleted. |
| [Split(Char[])](https://msdn.microsoft.com/en-us/library/b873y76a(v=vs.110).aspx) | Returns a string array that contains the substrings in this instance that are delimited by elements of a specified Unicode character array. |
| [Substring(Int32)](https://msdn.microsoft.com/en-us/library/hxthx5h6(v=vs.110).aspx) | Retrieves a substring from this instance. The substring starts at a specified character position and continues to the end of the string. |
| [ToCharArray()](https://msdn.microsoft.com/en-us/library/ezftk57x(v=vs.110).aspx) | Copies the characters in this instance to a Unicode character array. |
| [ToLower()](https://msdn.microsoft.com/en-us/library/e78f86at(v=vs.110).aspx) | Returns a copy of this string converted to lowercase. |
| [oString()](https://msdn.microsoft.com/en-us/library/8tc6ws5s(v=vs.110).aspx) | Returns this instance of [String](https://msdn.microsoft.com/en-us/library/system.string(v=vs.110).aspx); no actual conversion is performed. (Overrides [Object.ToString()](https://msdn.microsoft.com/en-us/library/system.object.tostring(v=vs.110).aspx).) |
| [ToUpper()](https://msdn.microsoft.com/en-us/library/ewdd6aed(v=vs.110).aspx) | Returns a copy of this string converted to uppercase. |
| [Trim()](https://msdn.microsoft.com/en-us/library/t97s7bs3(v=vs.110).aspx) | Removes all leading and trailing white-space characters from the current [String](https://msdn.microsoft.com/en-us/library/system.string(v=vs.110).aspx) object. |