

## Language Map for C#

<p><b>Variable Declaration</b>  <i>Is this language strongly typed or dynamically typed?  Provide an example of how variables are declared in this language.</i></p>	<p>C# is a strongly typed language  Variables are declared much like in Java  int hours = 12;  double cost = 2.99;  string name = "Jake";</p>
<p><b>Data Types</b>  <i>List all of the data types (and ranges) supported by this language.</i></p>	<p>byte ranges 0 to 255  sbyte ranges -128 to 127  short ranges -32,768 to 32,767  ushort ranges 0 to 65,535  int ranges -2,147,483,648 to 2,147,483,647  uint ranges 0 to 4,294,967,295  long ranges -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807  ulong ranges 0 to 18,446,744,073,709,551,615  float ranges -3.402823e38 to 3.402823e38  double ranges -1.79769313486232e308 to 1.79769313486232e308  decimal ranges (-7.9 x 10<sup>28</sup> to 7.9 x 10<sup>28</sup>) / (100 to 28)  char ranges Any valid character, a,*, \x0058 (hex), or\u0058  bool ranges True or False</p>
<p><b>Selection Structures</b>  <i>Provide examples of all selection structures supported by this language (if, if else, etc.)</i></p>	<pre> if else : if (temp &lt; 40)     {         Console.WriteLine(" It's Cold!");     } else     {         Console.WriteLine("Not Bad!");     } if:    if (money = 0)     {         Console.WriteLine("Insufficient Funds");     }     {         Console.WriteLine("Bills Paid");     } </pre>

	<pre> Switch: switch (temp) {     Temp &lt; 32:         Console.WriteLine("It is freezing!");         break;      Temp &gt; 32 &amp;&amp; Temp &lt; 80:         Console.WriteLine("Not too bad!");         break;      Temp &gt; 80:         Console.WriteLine("It's Hot!");         break; } </pre>
<b>Repetition Structures</b> <i>Provide examples of all repetition structures supported by this language (loops, etc.)</i>	<pre> for loop: int number = 10;         for(int i = 0; i &lt; number; i++)             Console.WriteLine(i);  While loop: int number = 0             while(number &lt; 10)             {                 Console.WriteLine(number);                 number = number + 1;             }  do loop: int number = 0;         do         {             Console.WriteLine(number);             number = number + 1;         } while(number &lt; 5);  foreach loop: int[] numbers = { 1, 2, 3, 4, 5 };             foreach (int i in numbers)             {                 Console.WriteLine("The value of i = {0}", i );             } </pre>
<b>Arrays</b>	<pre> int[] newNum = {20,30,40,50}; </pre>

<p><i>If this language supports arrays, provide an example of creating an array with a primitive data type (e.g. float, int, etc.)</i></p>	<pre>int[] newNum = new int[4]; int[] newNum = new int[4]{20,30,40,50};</pre>
<p><b>Data Structures</b></p> <p><i>If this language provides a standard set of data structures, provide a list of the data structures and their Big-Oh complexity.</i></p>	<p>Big O worst cases</p> <p>Array- Search O(n), Insertion O(n), Deletion O(n)</p> <p>Stack- Search O(n), Insertion O(1) Deletion O(1)</p> <p>Queue- Search O(n), Insertion O(1), Deletion O(1)</p> <p>Linked Lists- Search O(n), Insertion O(1), Deletion O(1)</p> <p>Hashtable- Search O(n), Insertion O(n), Deletion O(n)</p> <p>Binary Search Tree- Search O(n), Insertion O(n), Deletion O(n)</p>
<p><b>Objects</b></p> <p><i>If this language support object-orientation, provide an example of how to create a simple object with a default constructor.</i></p>	<p>C# is an object-oriented programming language</p> <p>Creating an object is similar to how you do it in java</p> <pre>Car myCar = new Car();</pre>
<p><b>Runtime Environment</b></p> <p><i>What runtime environment does this language compile to? For example, Java compiles to the Java Virtual Machine.</i></p> <p><i>Do other languages also compile to this runtime?</i></p>	<p>C# uses the .NET runtime and compiles it IL(intermediate language). Other languages use this as well like C++, Visual Basic, Ada, F# and more</p>
<p><b>Libraries/Frameworks</b></p> <p><i>What are the popular libraries or frameworks used by programmers for this language? List at least three (3).</i></p>	<p>.NET framework was development by Microsoft for building and running applications on Windows. Mono is another framework sponsored by Microsoft that allows developers to easily create cross platform applications that are part of the .NET foundation. Accord.NET is another Framework that contains audio and image processing libraries. This is used for building production-grade computer vision, computer audition and statistical application for commercial use.</p>
<p><b>Domains</b></p> <p><i>What industries or domains use this programming language? Provide specific examples of companies that use this language and what they use it for.</i></p>	<p>C# is popular for web app development, game development, workflow applications, and windows services. Microsoft uses this for web and game development on their Xbox. City National Bank uses it for cloud development. Stack Overflow uses it for web service and its application development.</p>