Language Map for C#

Variable Declaration

Is this language strongly typed or dynamically typed? Provide an example of how variables are declared in this language.

- C# is a strongly typed language.
- Variables are declared with a data type, a name for the data type, an equals sign, the value, and ends with a semicolon
- Examples: int x = 5; string str1 = “Hello World”;

Data Types

List all of the data types (and ranges) supported by this language.

TYPE	DESCRIPTION	RANGE
byte	8-bit unsigned integer	0-255
sbyte	8-bit signed integer	-128 - 127
short	16-bit signed integer	-32,768 - 32,767
ushort	16-bit unsigned integer	0 – 65,535
int	32-bit signed integer	-2,147,483,648 – 2,147,483,647
uint	32-bit unsigned integer	0 – 4,294,967,295
long	64-bit signed integer	-9,223,372,036,854,775,808 – 9,223,372,036,854,775,807
ulong	64-bit unsigned integer	0 – 18,446,744,073,709,551,615
float	32-bit single precision floating point type	-3.402823e308 – 3.402823e308
double	64-bit double precision floating point type	-1.79769313486232e308 - 1.79769313486232e308
decimal	128-bit decimal type	(+ or -) 1.0x10e-28 – 7.9x10e28
char	16-bit single Unicode character	Any valid character
bool	8-bit logical true/false value	True or False
string	A sequence of Unicode characters	
DateTime	Represents date and time	0:00:00am 1/1/01 to 11:59:59pm 12/31/9999

Selection Structures

Provide examples of all selection structures supported by this language (if, if else, etc.)

SELECTION STRUCTURE	EXAMPLE

if	if (x <10)
	{
	x = x+1;
	}

if-else	if (x < 10)
	{
	  x = x+1;
	}
	else
	{
	  int y = x;
	}

else-if	if (x < 10)
	{
	  x = x+1;
	}
	else if (x > 10)
	{
	  x = x-1;
	}
	else
	{
	  int y = x;
	}

Switch	int value;
	string output = “”;
	switch (value)
	{
	  case 1:
	  output = “A”;
	  break;
	  case 2:
	  output = “B”;
	  break;
	  case 3:
	  output = “C”;
	  break;
	  case 4:
	  output = “D”;
	  break;
	  case 5:

<table>
<tr><td></td><td>
<table>
<tr><td></td><td>output = “F”;
break;
default:
output = “default”;
break;</td></tr>
</table>
</td></tr>
<tr><td>Repetition Structures
Provide examples of all repetition structures supported by this language (loops, etc.)</td><td>
<table>
<tr><th>REPETITION STRUCTURE</th><th>EXAMPLE</th></tr>
<tr><td>while loop</td><td>int num = 0;
while (num < 5)
{
num = num + 1;
}</td></tr>
<tr><td>do loop</td><td>int num = 0;
do
{
num = num + 1;
}
while (num < 5)</td></tr>
<tr><td>for loop</td><td>for (int i = 0; i < 10; i++)</td></tr>
<tr><td>for-each loop</td><td>ArrayList list = new ArrayList( );
foreach(int number in list)
Console.WriteLine(number)</td></tr>
</table>
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<tr><td>Arrays
If this language supports arrays, provide an example of creating an array with a primitive data type (e.g. float, int, etc.)</td><td>int[ ] array = new int[5];

OR

int[ ] array = new int[ ] {1, 2, 3, 4, 5};</td></tr>
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Data Structures

If this language provides a standard set of data structures, provide a list of the data structures and their Big-Oh complexity.

Data Structure	Time Complexity								Space Complexity
	Average				Worst				Worst
	Access	Search	Insertion	Deletion	Access	Search	Insertion	Deletion	
Array	O(1)	O(n)	O(n)	O(n)		O(n)	O(n)	O(n)	O(n)
Stack	O(n)	O(n)	O(1)	O(1)	O(n)	O(n)	O(1)	O(1)	O(n)
Queue	O(n)	O(n)	O(1)	O(1)	O(n)	O(n)	O(1)	O(1)	O(n)
Singly-Linked List	O(n)	O(n)	O(1)	O(1)	O(n)	O(n)	O(1)	O(1)	O(n)
Doubly-Linked List	O(n)	O(n)	O(1)	O(1)	O(n)	O(n)	O(1)	O(1)	O(n)
Skip List	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n)	O(n)	O(n)	O(n)	O(n log(n))
Hash Table		O(1)	O(1)	O(1)		O(n)	O(n)	O(n)	O(n)
Binary Search Tree	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n)	O(n)	O(n)	O(n)	O(n)
Cartesian Tree		O(n log(n))	O(n log(n))	O(n log(n))		O(n)	O(n)	O(n)	O(n)
B-Tree	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n)
Red-Black Tree	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n)
Splay Tree		O(n log(n))	O(n log(n))	O(n log(n))		O(n log(n))	O(n log(n))	O(n log(n))	O(n)
AVL Tree	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n)
KD Tree	O(n log(n))	O(n log(n))	O(n log(n))	O(n log(n))	O(n)	O(n)	O(n)	O(n)	O(n)

Objects
If this language support object-orientation, provide an example of how to create a simple object with a default constructor.
	public class Adult
	{
	int age;
	public Adult( )
	{
	age = 18
	}
	public Adult(int age)
	{
	this.age = age;
	}
	}

Runtime Environment *What runtime environment does this language compile to? For example, Java compiles to the Java Virtual Machine.* *Do other languages also compile to this runtime?*	C# uses the Common Language Runtime (CLR)
Libraries/Frameworks *What are the popular libraries or frameworks used by programmers for this language? List at least three (3).*	1. Newtonsoft 2. NzbDrone 3. Cake 4. Orchard 5. dnSpy
Domains *What industries or domains use this programming language? Provide specific examples of companies that use this language and what they use it for.*	Microsoft - C# was created by Microsoft - It is used to develop Windows desktop applications StackOverflow - Website developed in C# that is designed to help programmers through Q&A's