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.

Yes, C# is a strongly typed language – meaning every variable, constant, and method declaration must specify a name, the type & kind of the input data, as well as the type & kind of the return data.

```
// declarative variable
float temperature;
string name;

// user-defined declarative variables with initializers
float temperature = 60.2;
string name = "Adam";
```

Data Types

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

int	4 bytes	whole numbers from -2,147,483,648 to 2,147,483,647
long	8 bytes	whole numbers from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807
float	4 bytes	fractional numbers with 6 to 7 decimal places
double	8 bytes	fractional numbers with 15 decimal places
bool	1 bit	true or false
char	2 bytes	single character/letter, surrounded by single quote ' '
string	2 bytes per character	sequence of characters/letters, surrounded by double quotes " "

Selection Structures

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

if

```
if (10 > 20) {
   Console.WriteLine("20 is greater than 10");
}
```

else

```
if (i > 20) {
   Console.WriteLine("20 is greater than i");
}
else {
   Console.WriteLine("20 is less than i");
}
```

if else

```
int myNumber = 10;

if (myNumber == 10) {
   Console.WriteLine("Value is 10");
}
```

		else {
		Console.WriteLine("Value is NOT 10");
		}

	else if	int timeOfDay = 22;
		
		if (timeOfDay < 10) {
		Console.WriteLine("Good morning");
		}
		else if (time < 20) {
		Console.WriteLine("Good afternoon");
		}
		else {
		Console.WriteLine("Good Evening");
		}

	switch	int day;
		
		switch(day) {
		case 1:
		Console.WriteLine("Monday");
		break;
		case 2:
		Console.WriteLine("Tuesday");
		break;
		case 3:
		Console.WriteLine("Wednesday");
		break;
		case 4:
		Console.WriteLine("Thursday");
		break;
		case 5:
		Console.WriteLine("Friday");
		break;
		}

Repetition Structures	while	int i = 0;

Provide examples of all repetition structures supported by this language (loops, etc.)

	while (i < 5) { **Console.WriteLine(i);** **i++;** **}**
do while	**int i = 0;** **do {** **Console.WriteLine(i);** **i++;** **}** **while (i < 5);**
for	**for (int i = 0; i < 5; i++) {** **Console.WriteLine(i);** **}**
foreach	**string [] drinks = {"Coke", "Pepsi", "Sprite"};** **foreach (string i in drinks) {** **Console.WriteLine(i);** **}**

Arrays

If this language supports arrays, provide an example of creating an array with a primitive data type (e.g. float, int, etc.)

```
string [] drinks = {"Coke", "Pepsi", "Sprite"};
```

Data Structures

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

Arrays	**O(1)**
LinkedList	**O(n)**
Stack	**O(1)**
Queue	**O(1)**
Linked List	**O(n)**
Hashtable	**O(1)**
Binary Tree	**O(log n)**
Binary Search Tree	**O(log n)**
Graphs	**O(1)**

Objects

If this language supports object-orientation, provide an example of how to create a simple object with a default constructor.

```
class Drink {
   string flavor = "Sprite";

   static void Main(string[] args) {
      Drink testObj = new Drink();
      Console.WriteLine(testObj.flavor);
```

	} **}**
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# programs are compiled to the .NET runtime environment. Other languages that compile to the .NET runtime environment are F#, Visual Basic, C++, J#, JScript, IronPython, IronRuby, and Windows Powershell.**
Libraries/Frameworks *What are the popular libraries or frameworks used by programmers for this language? List at least three (3).*	**1. Hangfire – *fire-and-forget* (automate) tasks for your .NET applications.** **2. Swashbuckle – simplifies API development for users (documentation, UI to explore and test operations)** **3. AutoMapper – helps remove code that mapped one object to another.**
Domains *What industries or domains use this programming language? Provide specific examples of companies that use this language and what they use it for.*	**C# is primarily used in the app development industry. For example, Microsoft uses it for web & game development. Amazon uses it in their cloud-computing divisions to assist in front-end development. Epic Games uses C# to develop its Unreal Engine to help with visual game development**