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CS-311-ON

Basic Structures (MO 1.3)

Language Map for C#

Variable Declaration *Is this language strongly typed or dynamically typed? Provide at least three examples (with different data types or keywords) of how variables are declared in this language.*	C# is strongly typed - any passing of wrong parameter as argument creates compilation error int myInteger = 1994; string myString = “My name is …”; bool isTrue = true; (boolean)
Data Types *List all of the data types (and ranges) supported by this language.*	int (Int32) - range: -2,147,483,648 to 2,147,483,647 float - range: ±1.5 x 10^-45 to ±3.4 x 10^38 string - arbitrary sequence of characters bool - boolean value (true or false) char - a single character double - range: ±5.0 x 10^-324 to ±1.7 x 10^308 decimal - range: ±1.0 x 10^-28 to ±7.9 x 10^28

Selection Structures
 	
Provide examples of all selection structures supported by this language (if, if else, etc.) ***Don’t just list them, show***
	If statement:
	
	if (condition)
	
	{
	
	// Code to execute if condition is true

code samples of how each would look in a real program.	}
	If-else statement:
	if (condition)
	{
	  // Code to execute if condition is true
	}
	else
	{
	  // Code to execute if condition is false
	}
	Switch statement:
	switch (variable)
	{
	  case value1:
	  // Code for value1
	  break;
	  case value2:
	  // Code for value2
	  break;
	  default:
	  // Code for other cases
	  break;
	}

Repetition Structures
 	
Provide examples of all repetition structures supported by this language (loops, etc.) ***Don't just list them, show code samples of how each would look in a real program.***
	For loop:
	
	for (int i = 0; i < 10; i++)
	
	{
	
	// Code to repeat
	
	}
	
	While loop:
	
	while (condition)
	
	{
	
	// Code to repeat
	
	}
	
	Do-while loop:
	
	do
	
	{
	
	// Code to repeat
	
	} while (condition);

Arrays *If this language supports arrays, provide* ***at least two examples*** *of creating an array with a primitive or String data types (e.g. float, int, String, etc.) If the language supports declaring arrays in multiple ways, provide an example of way.*	**Array of Integers:** int[] intArray = new int[] { 1, 2, 3, 4, 5 }; **Strings:** string[] stringArray = new string[] { "Levi", "Mary", "Paul" };

Data Structures *If this language provides a standard set of data structures, provide a list of the data structures and their Big-Oh complexity (identify what the complexity represents).*	There are various data structures like LIst, Dictionary, and HashSet. The BigO complexities vary depending on the operation - List has O(1) for indexing and O(n) for insertion and deletion. O(1) means the runtime is independent and bounded by a constant, whereas O(n) means the algorithm increases linearly with the size of the input.

Objects
 	
If this language support object-orientation, provide an example of how you would write a simple object with a default constructor and then how you would instantiate it.
	class MyClass
	{
	public int MyProperty { get; set; }
	Public MyClass()
	{
	MyProperty = 0;
	}
	//end default constructor
	}
	//instantiate MyClass
	MyClass myObject = new MyClass();
	//Set properties
	myObject.MyProperty = 42;

Runtime Environment *What runtime environment does this language compile to? For example, Java compiles to the Java Virtual Machine.*	C# is compiled into Common Intermediate Language and runs on the Common Language Runtime(CLR) similarly to F# and VB.NET.

Do other languages also compile to this runtime? If so, what these other languages?	
Libraries/Frameworks *What are the popular libraries or frameworks used by programmers for this language? List at least three (3) and describe what they are used for.*	- ASP.NET: Used for building web applications. - Entity Framework: An Object-Relational Mapping (ORM) framework for database interactions. - Xamarin: Used for developing cross-platform mobile applications.
Domains *What industries or domains use this programming language? Provide at least three specific examples of companies that use this language and what they use it for**. E.g. Company X uses C# for its line of business applications.***	- Microsoft uses C# for Windows applications and Azure cloud services. - Financial institutions use C# for building trading platforms. - Game development companies use C# with Unity for game development