

MODULE 1: INTRODUCTION TO PROGRAMMING

Variables and Data Types

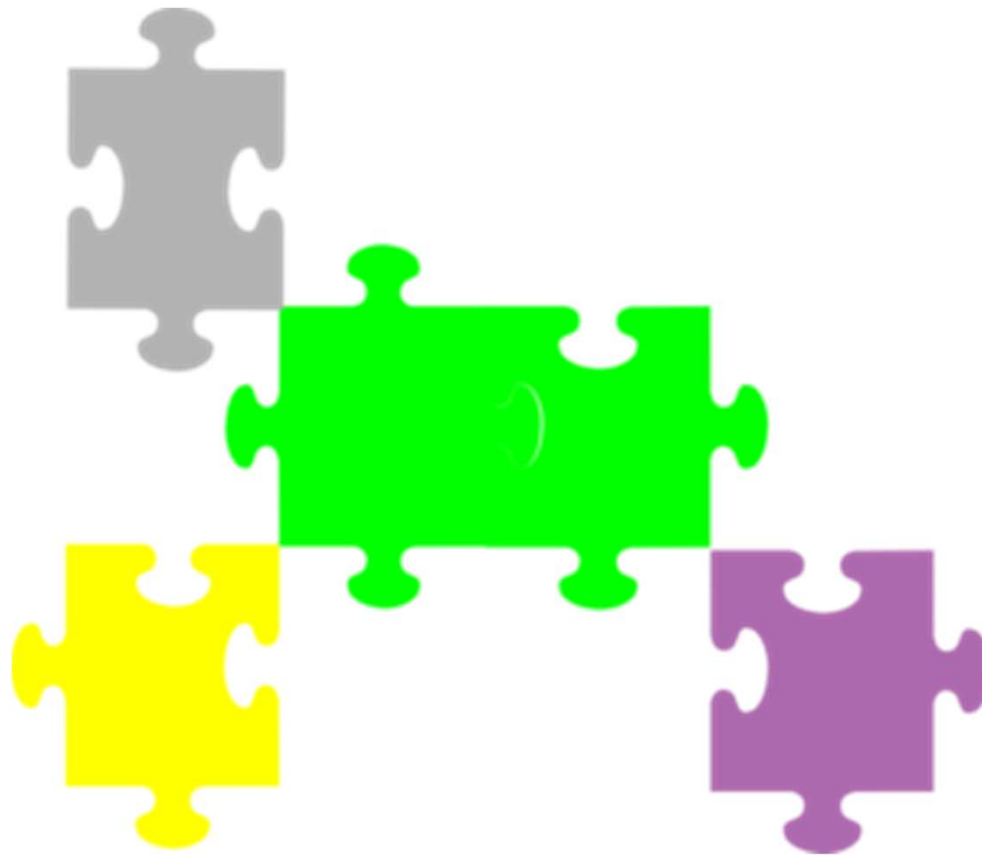




Yesterday

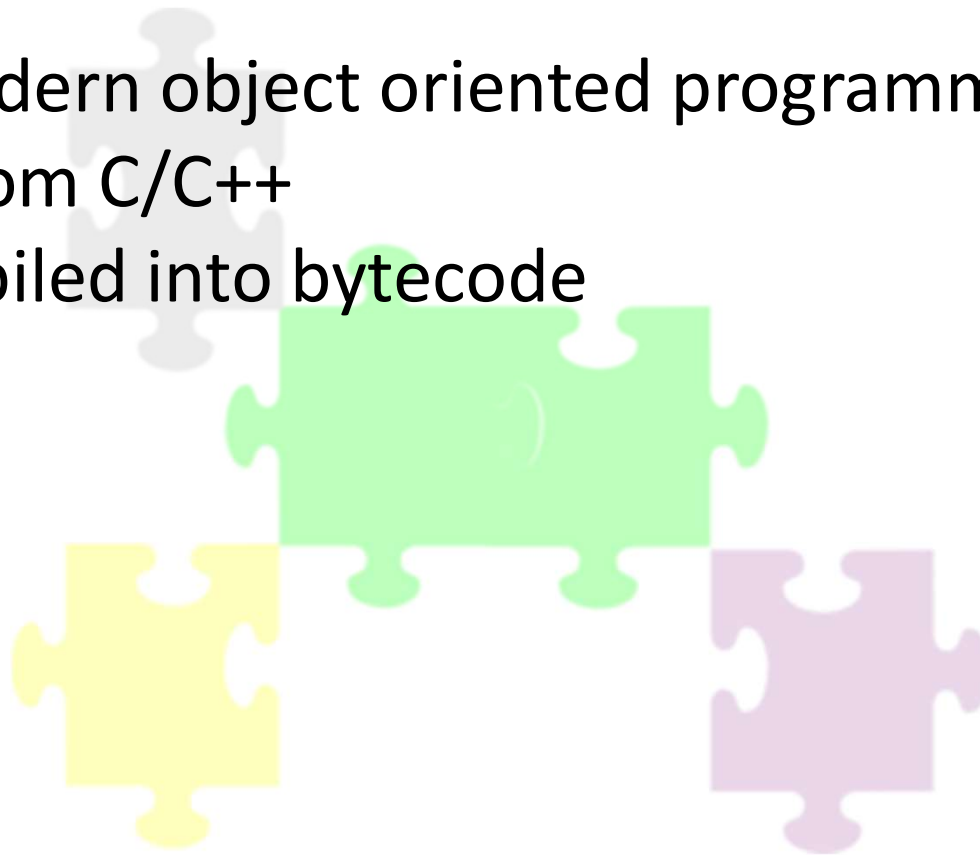
- What is a shell?
- What is Git?
- What is a Repository?

C#, .Net, and Visual Studio



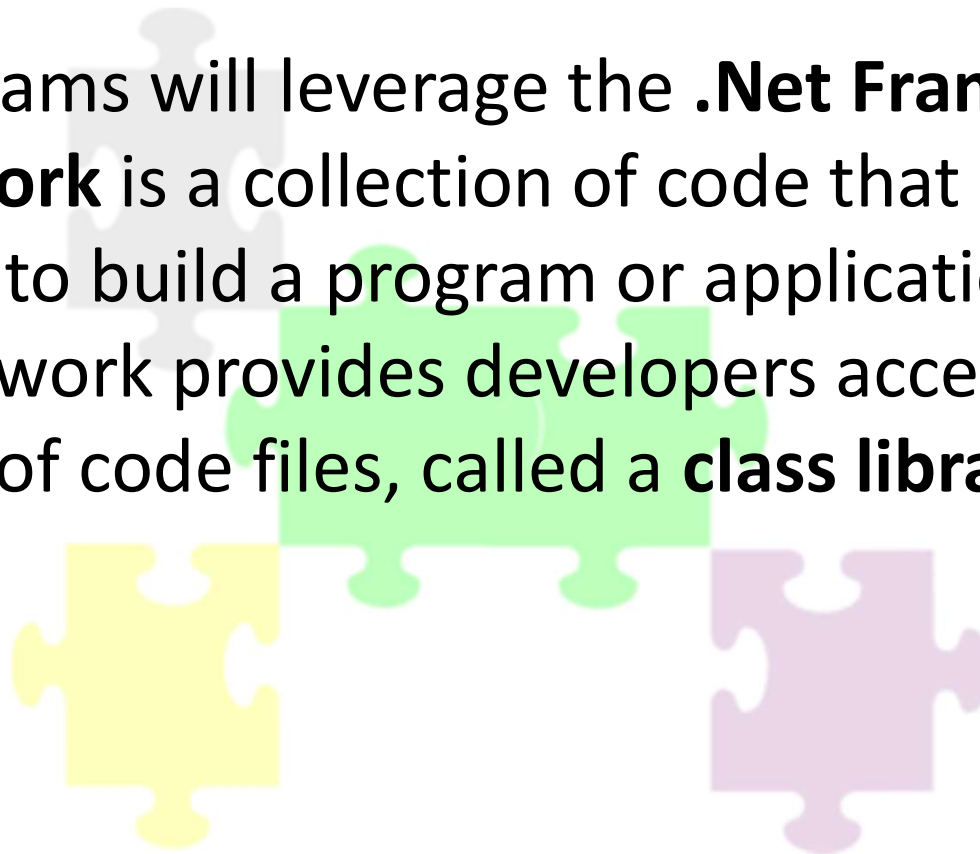
C#, .Net, and Visual Studio

- **C#** is a modern object oriented programming language derived from C/C++
- C# is compiled into bytecode



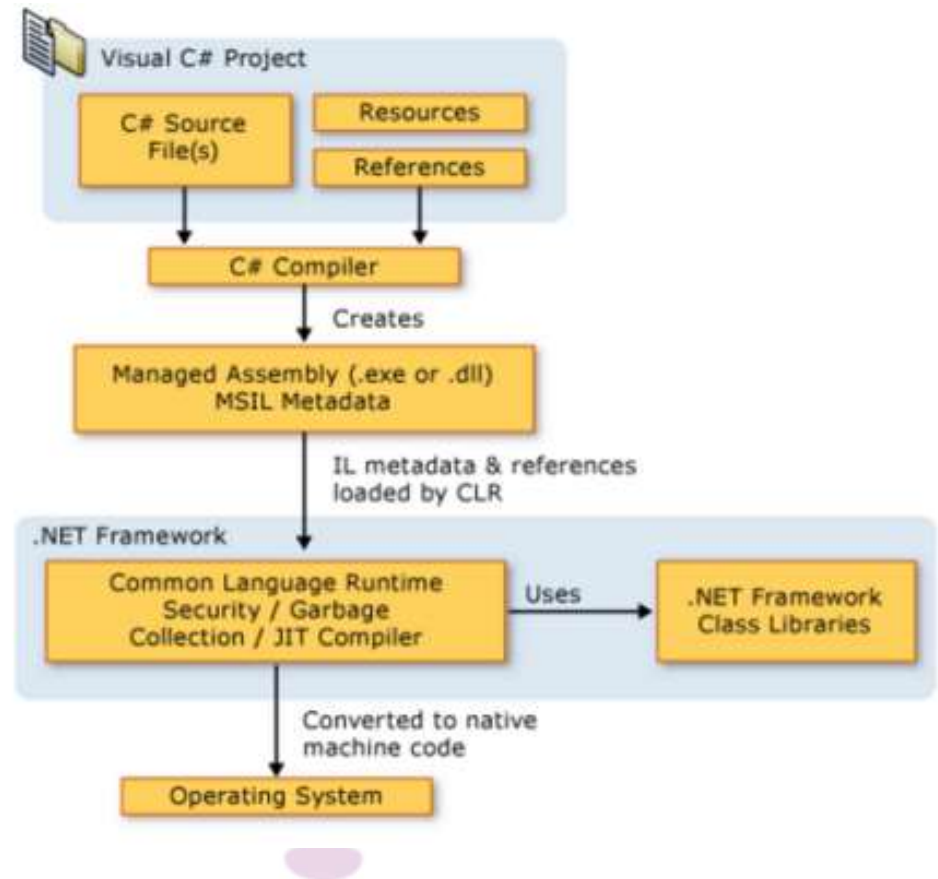
C#, .Net, and Visual Studio

- Your programs will leverage the **.Net Framework**
- A **Framework** is a collection of code that programmers can utilize to build a program or application.
- The framework provides developers access to a collection of code files, called a **class library**.



C#, .Net, and Visual Studio

- CLR: Common Language Runtime
- A **runtime** environment is a virtual environment that allows a program to send instructions to the computer's processor.



C#, .Net, and Visual Studio

- Visual Studio is an IDE (Integrated Developer Environment)
- IDEs are handy for:
 - organizing code into projects and solutions
 - providing immediate feedback on syntax errors
 - code assistance through intellisense
 - support suspending a program to step through and debug code

LET'S CODE!



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What is program or application?

- Two aspects: Data and Behavior
 - **Data** that will hold information that our program will store
 - **Behavior** will manipulate that data and transform it into something valuable

Variables

- **Variable** is a storage container paired with a symbolic name or identifier.
- Variables have **value** and **type**

Variable Declaration and Initialization

- `int numberOfStudents;`

- `datatype variableName;`



Declaration

Variable Declaration and Initialization

- `int numberOfStudents;`

- `datatype variableName;`



Declaration

- `numberOfStudents = 0;`

- `variableName equals value;`



Initialization

Sample Data Types

C#	Range
<code>bool</code>	true or false
<code>byte</code>	0 to 255
<code>char</code>	U+0000 to U+FFFF ('a', 'b', etc.)
<code>int</code>	-2^{31} to 2^{31}
<code>float</code>	-3.4×10^{38} to 3.4×10^{38}
<code>double</code>	$\pm 5.0 \times 10^{-324}$ to $\pm 1.7 \times 10^{308}$
<code>long</code>	-2^{63} to 2^{63}
<code>decimal</code>	$(-7.9 \times 10^{28}$ to $7.9 \times 10^{28}) / (10^0$ to $10^{28})$

Strings

- **string** represents a sequence of zero or more Unicode characters.
- Escape characters: `\n` and `\t`

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Expressions

- An **expression** is statement of code which can be evaluated to produce a result.

Category	Operators
multiplicative	* or / or %
additive	+ or -
assignment	=

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Type Conversion

```
int firstNumber = 15;  
double secondNumber = 150;  
secondNumber = firstNumber;
```

```
firstNumber = secondNumber;
```



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C#	Range
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int	-2^{31} to 2^{31}
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LET'S CODE!



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WHAT QUESTIONS DO
YOU HAVE?



Reading for tonight: **Logical Branching**

