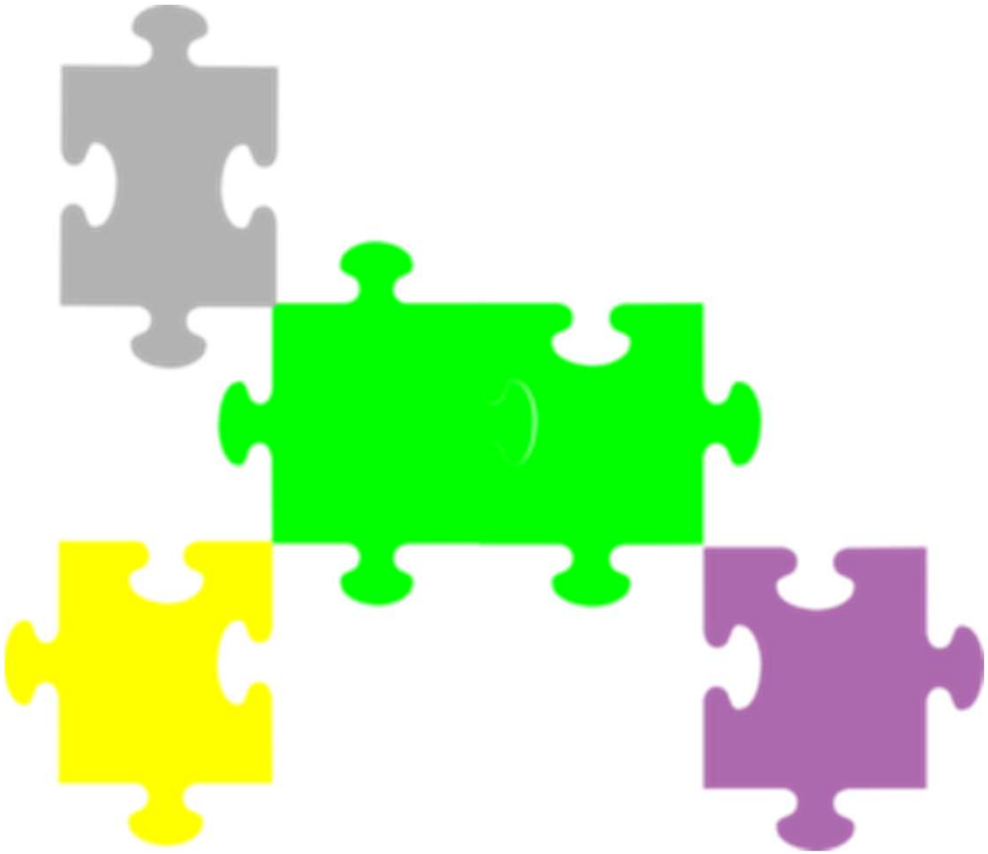
MODULE 1: INTRODUCTION TO PROGRAMMING

Variables and Data Types

Yesterday

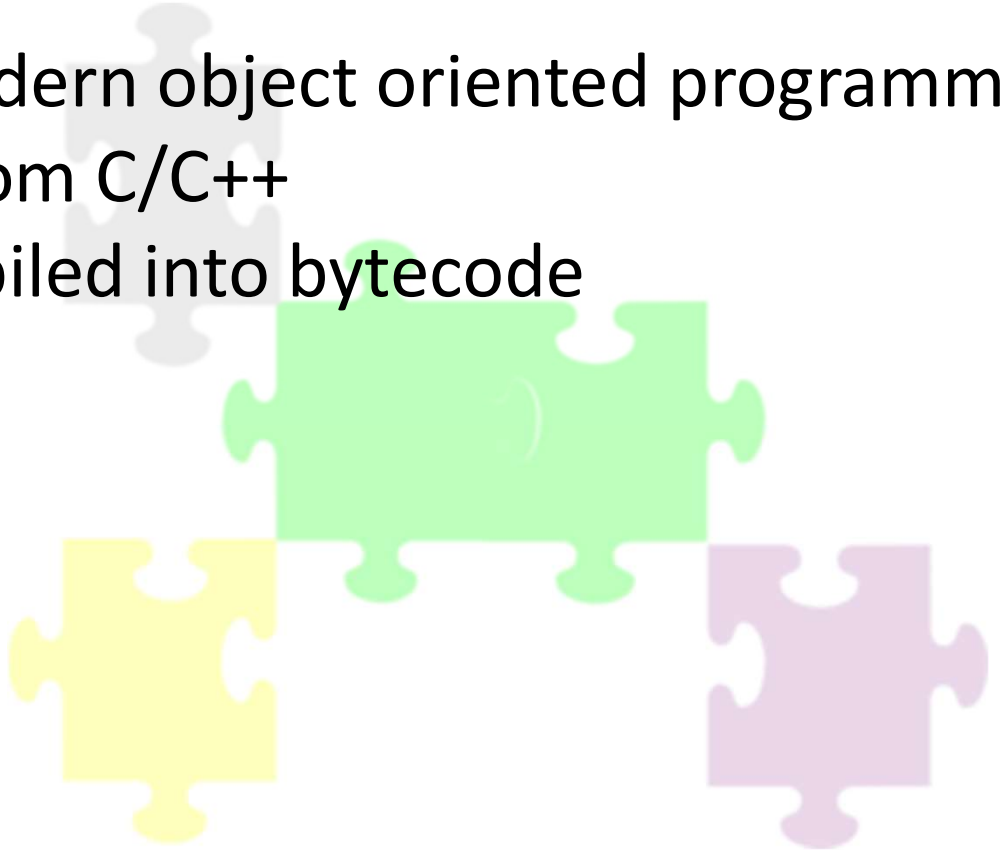
- What is a shell?
- What is Git?
- What is a Repository?

C#, .Net, and Visual Studio



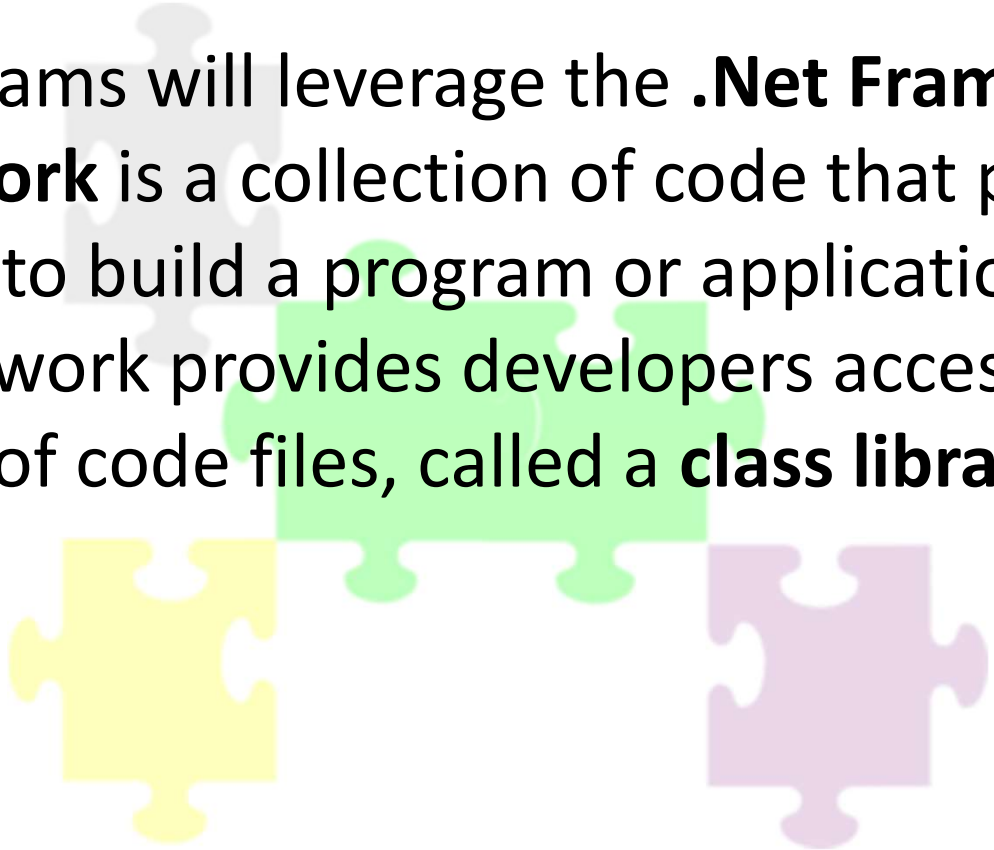
C#, .Net, and Visual Studio

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



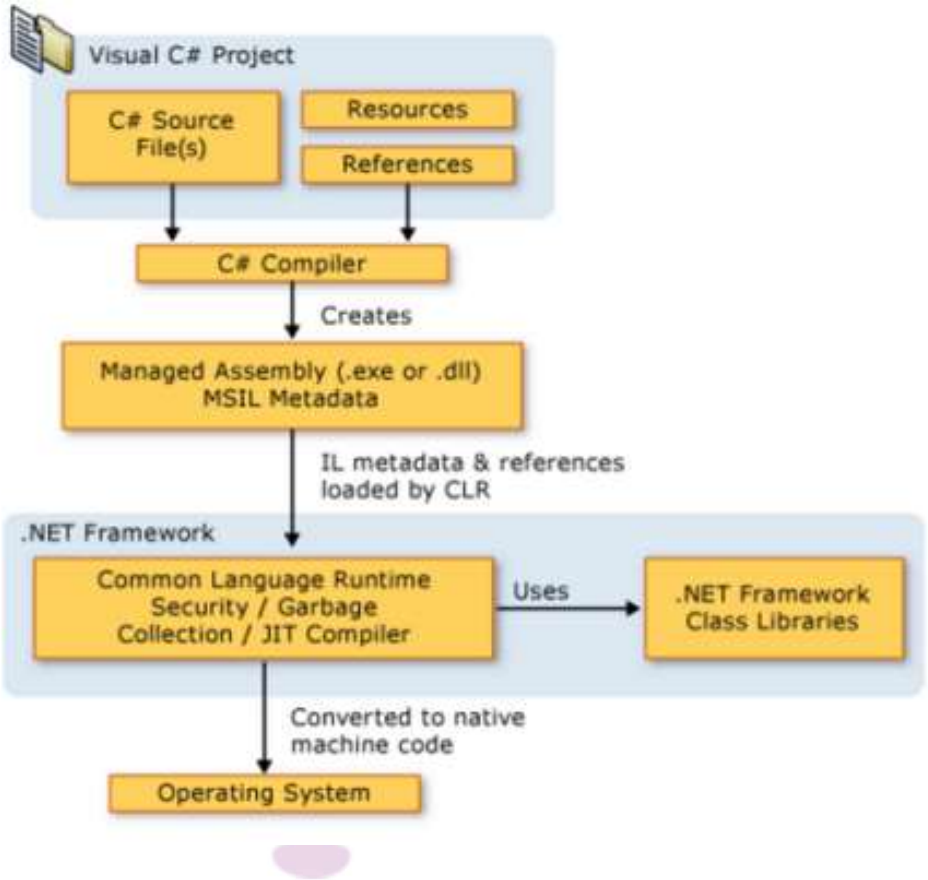
C#, .Net, and Visual Studio

- 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!

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

- int numberOfStudents;

- datatype variableName;

Variable Initialization

- int numberOfStudents;
- datatype variableName;
- numberOfStudents = 0;
- variableName equals value;

Sample Data Types

C#	Range
`bool`	true or false
`byte`	0 to 255
`char`	U+0000 to U+FFFF ('a', 'b', etc.)
`int`	-2^31 to 2^31
`float`	-3.4×10^38 to 3.4×10^38
`double`	±5.0 × 10^−324 to ±1.7 × 10^308
`long`	-2^63 to 2^63
`decimal`	(-7.9×10^28 to 7.9×1028) / (10^0 to 10^28)

Strings

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

LET'S CODE!

Expressions

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

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

LET'S CODE!

Type Conversion

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

```
firstNumber = secondNumber;
```

C#	Range
`bool`	true or false
`byte`	0 to 255
`char`	U+0000 to U+FFFF ('a', 'b', etc.)
`int`	-2^31 to 2^31
`float`	-3.4×10^38 to 3.4×10^38
`double`	±5.0 × 10^−324 to ±1.7 × 10^308
`long`	-2^63 to 2^63
`decimal`	(-7.9×10^28 to 7.9×1028) / (10^0 to 10^28)

LET'S CODE!

WHAT QUESTIONS DO YOU HAVE?

Reading for tonight:
Logical Branching