Logols Learning

WEEKEND WEB DEVELOPMENT BOOT CAMP

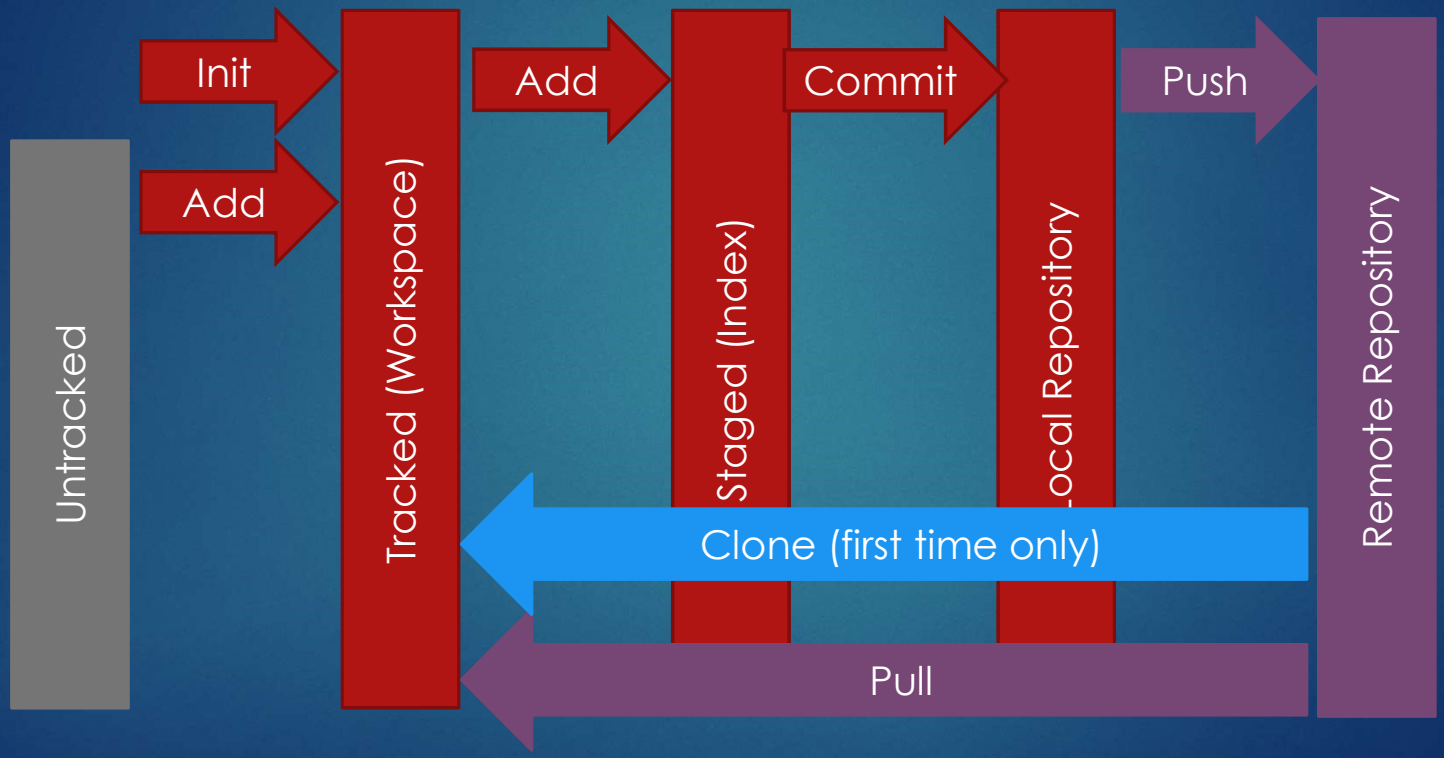
TRAINING: C#

Visual Studio Code

Git

- Version Control System (VCS)
- Repository
  - Central location for code
  - Keeps a history
  - Different versions of code
- Github – hosts repositories

Git Workflow



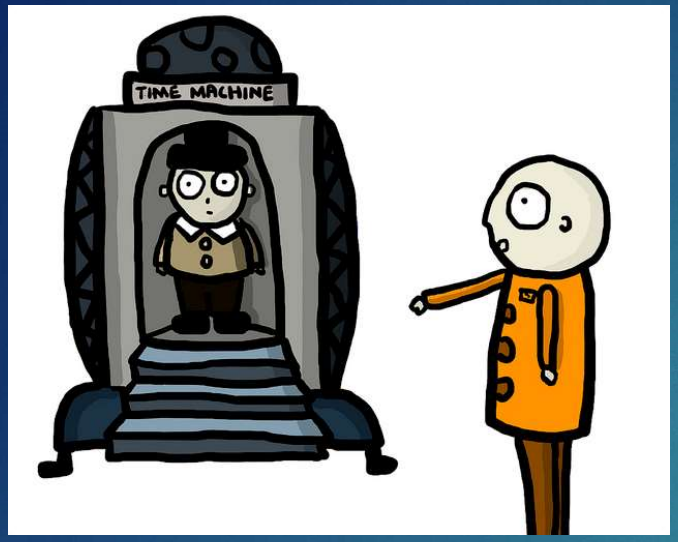
Git / Github

.Net Command Line Interface (CLI)

- Commands within the command line
- Entered in the terminal window
- Basic Commands
  - new, build, run
- Project Modification Commands
  - add/remove package, add/remove reference

CLI new Examples

- mkdir – create directory
- cd – change directory
- Console project:
  - dotnet new console
- Class Library project:
  - dotnet new classlib
- Web API project:
  - dotnet new webapi

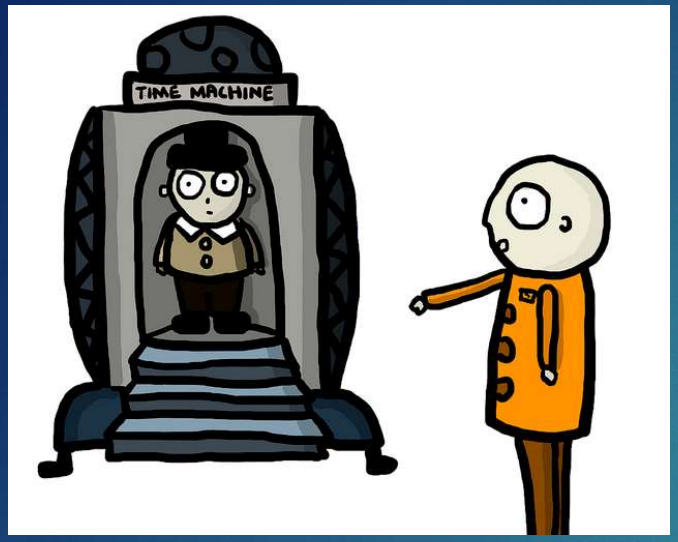


EXAMPLE

NEW CONSOLE APPLICATION IN VISUAL STUDIO CODE

Statements

- Made up of:
  - Keywords
  - Expressions
  - Operators
- Statements end with a Semicolon ;
- Statements can span multiple lines
- Statement blocks contain multiple statements
  - Surrounded by curly braces { }
  - Can have blocks within blocks

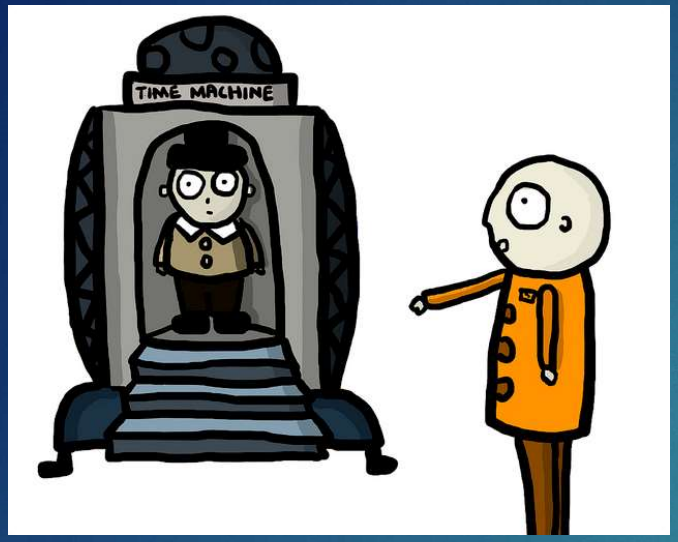


EXAMPLE

STATEMENTS AND STATEMENT BLOCKS

C# Comments

- // this is a comment
  - Single line comments
- /* this is a multi line comment */
  - Multi-line comments



EXAMPLE

COMMENTS

Types

- Basic Built-In Types
  - bool
  - int
  - decimal
  - string
  - array

Declaring String Variables

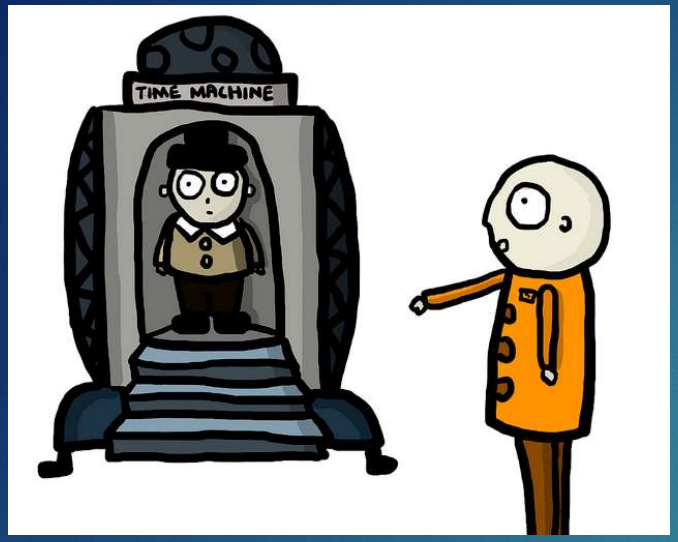
- Declaring Variables
  - string myString;
  - string myString = “test string”;
- Using Variables
  - Console.WriteLine(myString);

Declaring Number Variables

- Declaring Variables
  - int myInt;
  - int myInt = 5;
  - decimal myDecimal = 5.234;
- Using Variables
  - Console.WriteLine(myDecimal);

Declaring Bool Variables

- Declaring Variables
  - bool myBool;
  - bool myBool = true;
- Using Variables
  - Console.WriteLine(myBool);

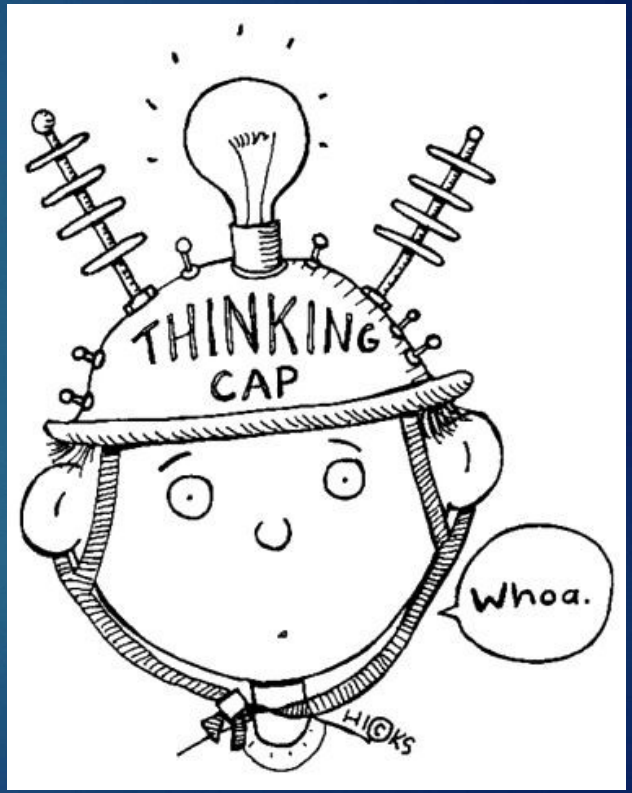


EXAMPLE

DECLARING VARIABLES

ASSESSMENT

CLI, STATEMENTS, BLOCKS, COMMENTS, VARIABLES



Comparison Operators

- ***Do not compare with =***
- < Less Than
- > Greater Than
- <= Less Than or Equal To
- >= Greater Than or Equal To
- == Equal To
- != Not Equal To

Logical Operators

- & And
- | Inclusive Or
- && Conditional And
- || Conditional Or

If Statement

- Example:

```
bool myVariable = true;
If (myVariable)
{
   console.writeLine(“true”);
}
```

If-Else Statement

- Example:

```
bool myVariable = true;
If (myVariable)
{
   console.writeLine(“true”);
}
else
{
 console.writeLine(“false”);
}
```

Nested If Statement

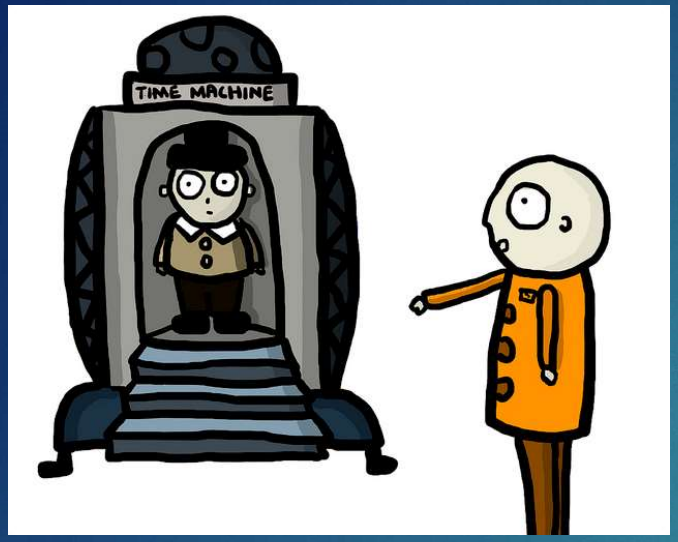
- Example:

```
bool myVariable = true;
bool myVariable2 = false;
If (myVariable)
{
   if(myVariable2)
   {
      console.writeLine(“true”);
   }
}
```

If Multiple Else Statement

- Example:

```
bool myVariable = true;
bool myVariable2 = true;
If (myVariable)
{
   console.writeLine("true");
}
else if(myVariable2)
{
   console.writeline("variable2 true");
}
else
…
```



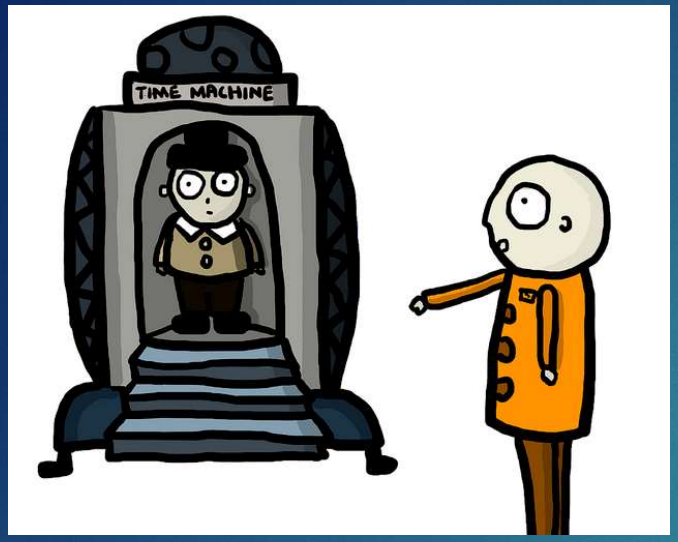
EXAMPLE

IF ELSE STATEMENTS

Switch Statement

- Example

```
int myVariable;
switch(myVariable)
{
   case 1:
      Console.WriteLine("1");
      break;
   case 2:
   case 3:
      Console.WriteLine("2 or 3");
      break;
   default:
      Console.WriteLine("default");
      break;
}
```

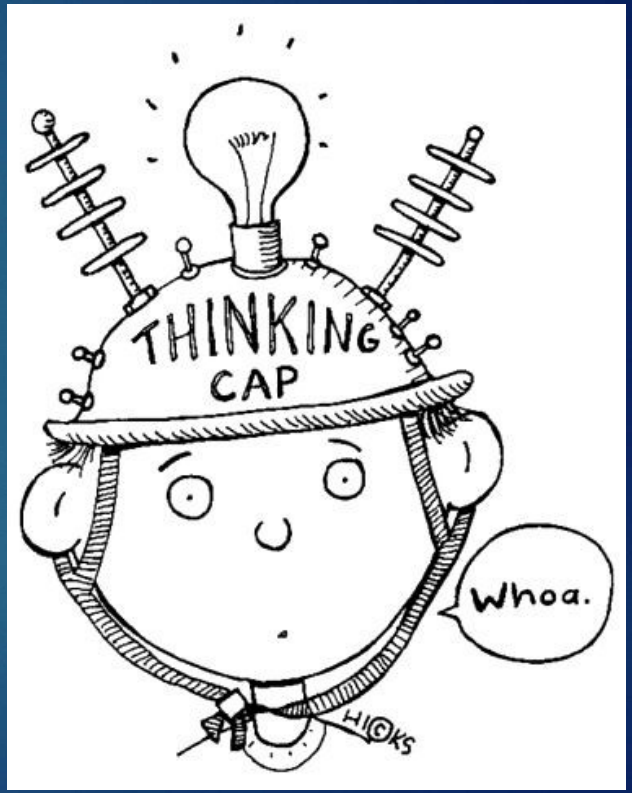


EXAMPLE

SWITCH STATEMENTS

ASSESSMENT

CONDITIONAL STATEMENTS



Assignment

- A status report is needed of all government employees. Statuses are:
  - 1: Alive, 2: Zombie, 3: Dead, 4: Unknown
- Given an int variable, write if else statements and console out the persons status.
- Using the same int variable, modify your code to perform the same operation with a switch statement.

Value and Reference Types

- Type System
  - Value Types
    - Contain data within it's own memory location.
    - int, decimal, bool
  - Reference Types
    - Contain a pointer to a memory location.
    - Require a new instance of an object.
    - Are null if no instance of an object has been provided.
    - string, array, class

Default Values

- Value Types
  - 0 for int or decimal
  - false for bool
- Reference Types
  - null
  - This means lack of a value
  - To check for null
    - If (variable == null)

Declaring Arrays

- Declaring Variables
  - int[] myArray;
  - myArray = new int [5];
  - myArray = new int[] {0, 1, 2, 3};
  - int[] myArray = new int[] {0, 1, 2, 3};
  - int[] myArray = {0, 1, 2, 3};
- Using Variables
  - myArray[5] = 6;
  - Console.WriteLine(myArray[5]);
  - myArray.Length

while Loop

- Example

```
int[] myArray = {0, 1, 2, 3};
int counter = 0;

while (counter < myArray.Length)
{
   Console.WriteLine(myArray[counter]);
   counter++;
}
```

do-while Loop

- Example

```
int[] myArray = {0, 1, 2, 3};
int counter = 0;

do
{
   Console.WriteLine(myArray[counter]);
   counter++;
} while (counter < myArray.Length);
```

for Loop

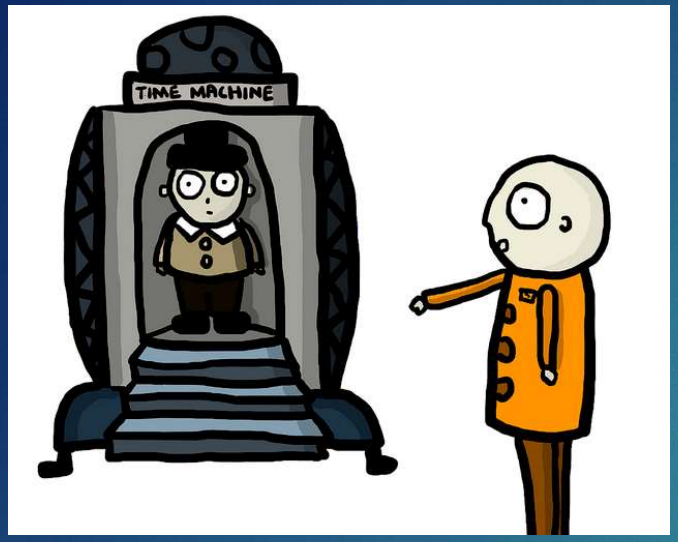
- Example

```
int[] myArray = {0, 1, 2, 3};

for(int counter = 0;  counter < myArray.Length;
counter++)
{
   Console.WriteLine(myArray[counter]);
}
```

foreach Loop

- Example

```
int[] myArray = {0, 1, 2, 3};

foreach(int value in myArray)
{
   Console.WriteLine(value);
}
```

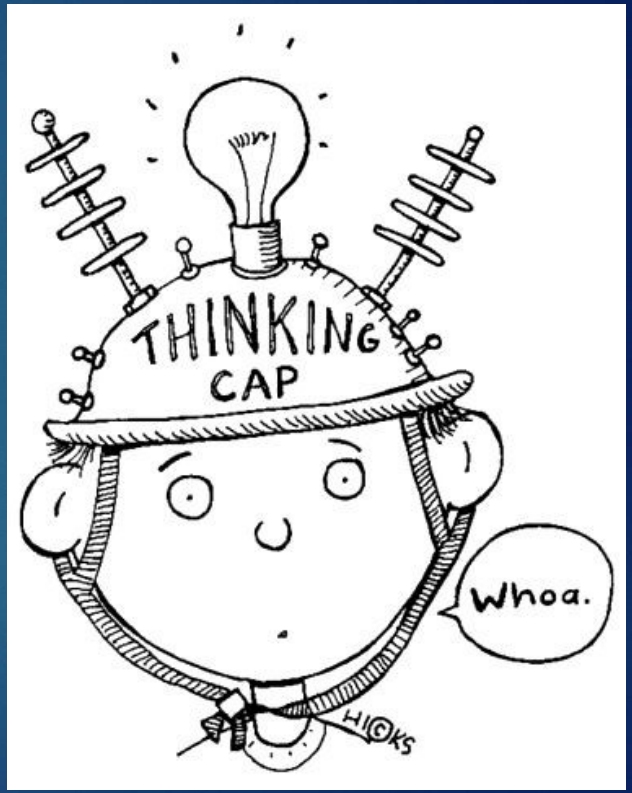


EXAMPLE

LOOPS

ASSESSMENT

LOOPS



Assignment

- A status report is needed of all government employees. Statuses are:
  - 1: Alive, 2: Zombie, 3: Dead, 4: Unknown
- Given an array of int variable, write loops with if else statements and console out everyone's status.
- Use all loop types.

Methods

- Smaller and Manageable
- Cohesive Actions
- Reusable
- Functions Return a Value
  - Only one value can be returned
- Voids do not Return a Value
- Parameters
- Method Overloads

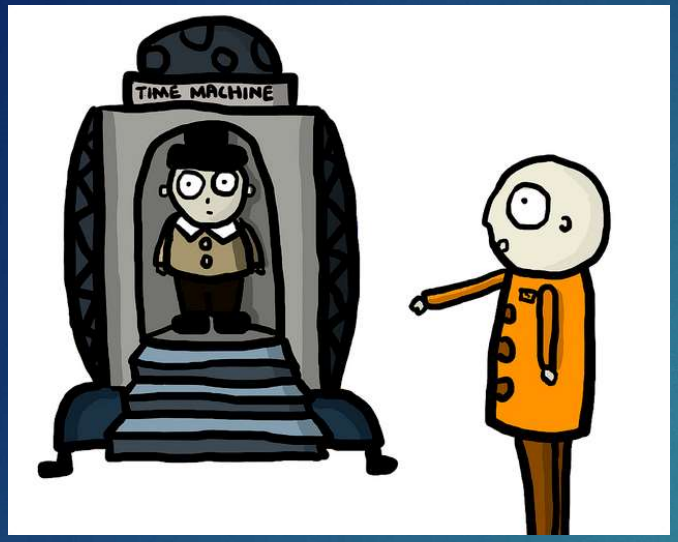
Method Syntax

[access modifier] [return type] [name]([type1] [parameter1], [type2] [parameter2])

```
{
    Statements...;
}
```

- Example:

```
private int AddNumbers(int num1, int num2)
{
    Statements...;
}
```

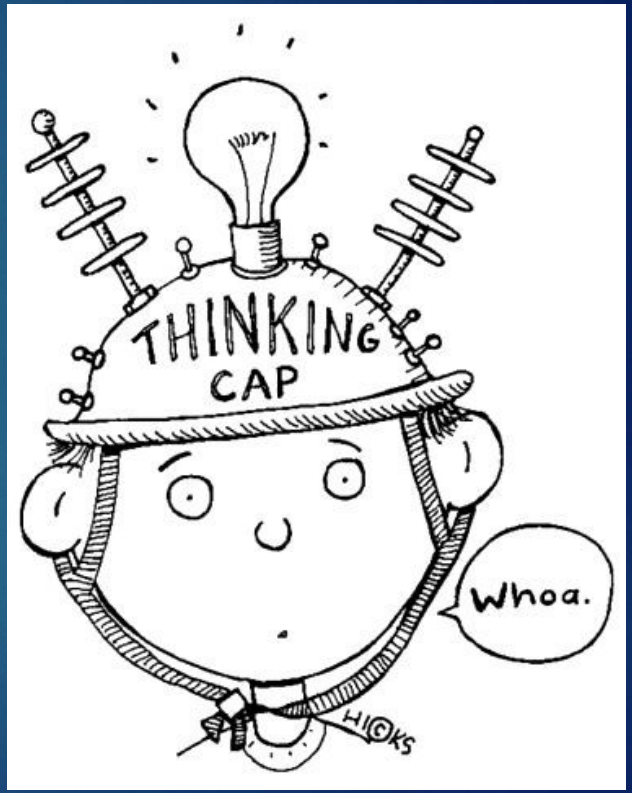


EXAMPLE

METHODS

ASSESSMENT

METHODS



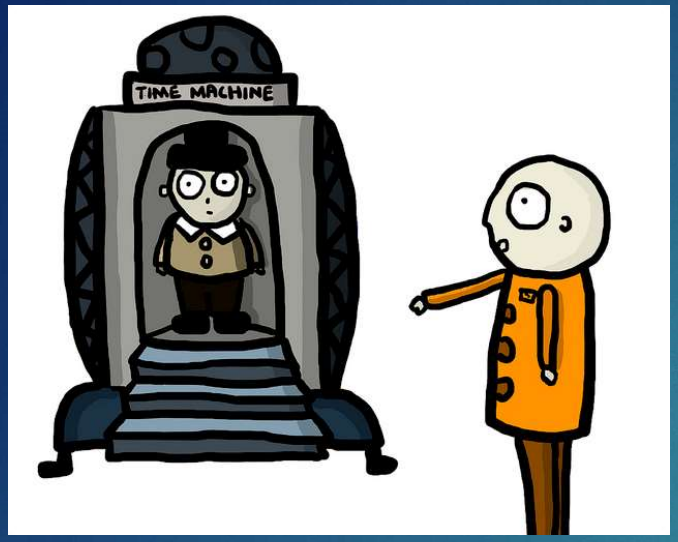
Assignment

- A status report is needed of all government employees. Statuses are:
  - 1: Alive, 2: Zombie, 3: Dead, 4: Unknown
- Modify your previous program to create a method that handles the condition given a parameter for status that returns the status string.

Working with Generic Types

- Type Safety
- Re-use
- Generic Collections – System.Collections.Generic
- Example:

```
List<string> strings = new List<string>();
strings.Add("test");
List<int> ints = new List<int>();
int.s.Add(3);
```

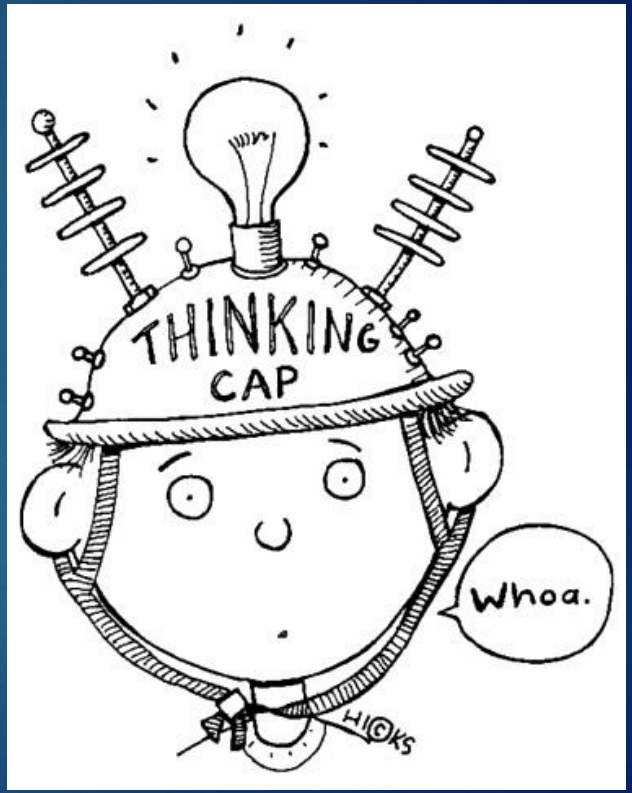


EXAMPLE

GENERICS

ASSESSMENT

GENERICS



Assignment

- A status report is needed of all government employees. Statuses are:
  - 1: Alive, 2: Zombie, 3: Dead, 4: Unknown
- Modify your previous program to create a generic list of status descriptions.

QUICK REVIEW

C#

Not really a sign you'd want to see whilst driving through an eerily quiet neighbourhood...

Additional Resources

- Code Katas
  - https://www.codewars.com/
- DotNet Fiddle
  - https://dotnetfiddle.net/
- Codeasy.net
  - https://codeasy.net/welcome
- Microsoft Virtual Academy
  - https://mva.microsoft.com/
- Microsoft Docs
  - https://docs.microsoft.com/en-us/dotnet/csharp/index

Keep Practicing!

- Try declaring different types of variables.
- Try different combinations of if, else statements.
- Try different combinations and logic for loops.
- Try creating different methods with different parameters and return types.
- Try different ways of working with the generic list.