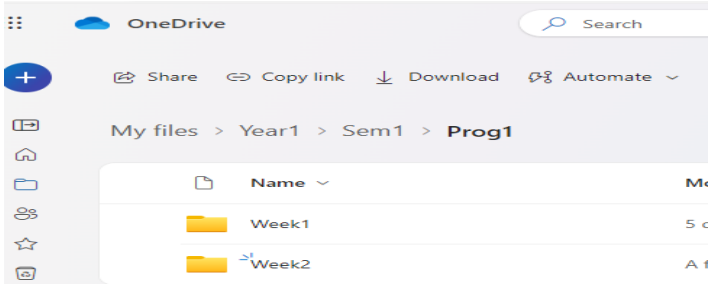
Week 2 , C# Programming 1 Lab Exercise
We will continue to write a few more c# programs from the OS prompt

1. Look at what we did last week in Week1, video available in your shared Programming1 folder
2. Open Visual Studio, Continue without code, Tools, Command Line & Developer Command Prompt

```
C:\Users\amitchell\source\repos>cd ..\..

C:\Users\amitchell>cd "OneDrive - Atlantic TU"

C:\Users\amitchell\OneDrive - Atlantic TU>cd year1

C:\Users\amitchell\OneDrive - Atlantic TU\Year1>cd sem1

C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1>cd week1
The system cannot find the path specified.

C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1>cd prog1

C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1>cd week1

C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week1>dir
 Volume in drive C is OS
 Volume Serial Number is FABC-7774

 Directory of C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week1

26/09/2023  20:32    <DIR>          .
26/09/2023  20:23    <DIR>          ..
21/09/2023  12:08               210 firstprogram.cs
21/09/2023  12:08             4,096 firstprogram.exe
26/09/2023  20:29               225 secondprogram.cs
               3 File(s)          4,531 bytes
               2 Dir(s)  41,235,755,008 bytes free

C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week1>csc secondprogram.cs
Microsoft (R) Visual C# Compiler version 4.3.0-3.22423.10 (b35bb0ba)
Copyright (C) Microsoft Corporation. All rights reserved.


C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week1>dir
 Volume in drive C is OS
 Volume Serial Number is FABC-7774

 Directory of C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week1

26/09/2023  20:34    <DIR>          .
26/09/2023  20:23    <DIR>          ..
21/09/2023  12:08               210 firstprogram.cs
21/09/2023  12:08             4,096 firstprogram.exe
26/09/2023  20:29               225 secondprogram.cs
26/09/2023  20:34             4,096 secondprogram.exe
```

3. Create a new subfolder in OneDrive Year1/Sem1/Prog1/Week2



4. To get to week2 folder

```
C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week1>cd ..

C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1>cd week2

C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week2>dir
 Volume in drive C is OS
 Volume Serial Number is FABC-7774

 Directory of C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week2

26/09/2023  20:36    <DIR>          .
26/09/2023  20:23    <DIR>          ..
26/09/2023  12:55               245 helloprogram.cs
               1 File(s)            245 bytes
               2 Dir(s)  41,234,399,232 bytes free
```

5. In week2 folder use notepad to create a new program called helloprogram.cs. This program is the same as the program you created last week, take a look back at last week's programs.

```
C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week2>notepad helloprogram.cs
```

6. The program will use \n to display a blank line, put \n into your **Console.WriteLine(" Test New Line\n Test");** and see what it looks like

```
using System;
class helloprogram
{
  static void Main()
  {
    Console.WriteLine(" Test New Line\n Test");
```

7. Compile the program and run it

```
C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week2>notepad helloprogram.cs

C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week2>csc helloprogram.cs
Microsoft (R) Visual C# Compiler version 4.3.0-3.22423.10 (b35bb0ba)
Copyright (C) Microsoft Corporation. All rights reserved.


C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week2>helloprogram
Test New Line
 Test
```

8. Now add 3 more line to you output and run the program with similar output to below

```
C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week2>helloprogram
Test New Line
 Test
Hello World its Aine here
Happy days this is my 2nd program

 *** Program Finished ******
```

9. Now we want to add comments to our program
   /* ……. Multi line block comment ***/***
   // …. Line comments
10. Add the following comment to you helloprogram.cs

```
/* Progran name:  helloprogram.cs
   Author: A Mitchell
   Date created : Sept 2023
   Purpose       : Display a Hello message */
using System;
class helloprogram
{
  static void Main()
  {
    //Declaration

    //Input

    //Processing

    // Output
    Console.WriteLine("Test New Line\n Test");
```

11. Create a new c# program with comments called variableProgram.cs
    In this program we will Declare 3 variables to store valued

https://www.w3schools.com/cs/cs_variables.php

C# Variables

Variables are containers for storing data values.

In C#, there are different **types** of variables (defined with different keywords), for example:

- `int` - stores integers (whole numbers), without decimals, such as 123 or -123
- `double` - stores floating point numbers, with decimals, such as 19.99 or -19.99
- `char` - stores single characters, such as 'a' or 'B'. Char values are surrounded by single quotes
- `string` - stores text, such as "Hello World". String values are surrounded by double quotes
- `bool` - stores values with two states: true or false

12. Declare and initialise a **string** variable *A string is an object of type String whose value is text.*
    string name =”Aine”;
13. Declare and initialise a **int** variable - *integer data type is a 32-bit signed integer and can hold values ranging from -2,147,483,648 to 2,147,483,647*
    Int age=30;
14. Declare and initialise a **double** variable A double has a floating point precision
    double lunch_cost=5.99;

C# floating point numbers

Floating point numbers represent real numbers in computing. Real numbers measure continuous quantities, like weight, height, or speed. In C# we have three floating point types: `float`, `double`, and `decimal`.

C# Alias	.NET Type	Size	Precision	Range
float	System.Single	4 bytes	7 digits	$+-1.5 \times 10^{-45}$ to $+-3.4 \times 10^{38}$
double	System.Double	8 bytes	15-16 digits	$+-5.0 \times 10^{-324}$ to $+-1.7 \times 10^{308}$
decimal	System.Decimal	16 bytes	28-29 decimal places	$+-1.0 \times 10^{-28}$ to $+-7.9 \times 10^{28}$

Now your program will look like

```
/* Progran name:  variableProgram.cs
   Author: A Mitchell
   Date created : Sept 2023
   Purpose       : Program to store and display variables  */
using System;
class variableProgram
{
  static void Main()
  {
    //Declaration and Initialise variables
    string name="Aine";
    int age =30;
    double lunch_cost=5.99;

    //Input

    //Processing

    // Output

   }

}
```

Console.WriteLine("My name is " + name);

15. Display and output the value of the variable name

```
    // Output
     Console.WriteLine("My name is " + name);
  }
```

16. Now compile and run the program and the output should be as below

```
C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week2>csc variableprogram.cs
Microsoft (R) Visual C# Compiler version 4.3.0-3.22423.10 (b35bb0ba)
Copyright (C) Microsoft Corporation. All rights reserved.

variableprogram.cs(12,9): warning CS0219: The variable 'age' is assigned but its value is never used
variableprogram.cs(13,12): warning CS0219: The variable 'lunch_cost' is assigned but its value is never used

C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week2>variableprogram
My name is Aine
```

17. Output the values of age and lunch_cost variable and output as below

```
C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week2>variableprogram
My name is Aine
My age is 30
My Lunch Cost is 5.99Euros
```

18. Create a new program called UserName.cs that will input a name and output that name

```
/* Progran name:  UserName.cs
   Author: A Mitchell
   Date created : Sept 2023
   Purpose       : Program to input and output a name  */
using System;
class UserName
{
  static void Main()
  {
    //Declaration
    string name;
    //Input
     Console.WriteLine("Name Program \n");
     Console.Write("Enter your name : ");
     name= Console.ReadLine();
    // Processing
    // Output
     Console.WriteLine("Your Name is "+name);
   }
}
```

19. Program output as below

```
C:\Users\amitchell\OneDrive - Atlantic TU\Year1\Sem1\Prog1\Week2>username
Name Program

Enter your name : Aine
Your Name is Aine
```

Program with Input Output and Processing

20. Create a program called sum.cs that allows user to input 2 integer values add the two numbers and output the result. No decimal places needed, using integer values.
    Use **int.parse()** function to convert string to integer, could also use **Convert.ToInt32()** function

```
/* Progran name:  sum.cs
   Author: A Mitchell
   Date created : Sept 2023
   Purpose      : Program to input 2 numbers add numbers and display result  */
using System;
class UserName
{
  static void Main()
  {
    //Declaration
    int firstnumber, secondnumber, result;
    //Input
     Console.WriteLine("Sum Program \n");
     Console.Write("Enter First Number : ");
     firstnumber = int.Parse(Console.ReadLine());
     Console.Write("Enter Second Number : ");
     secondnumber = int.Parse(Console.ReadLine());
    // Processing
     result=firstnumber+secondnumber;
    // Output
     Console.WriteLine("The sum of " + firstnumber + "+" + secondnumber + "=" +result );
   }
}
```

```
C:\Users\amitchell\OneDrive - Atlantic TU\Year1\S
Sum Program

Enter First Number : 23
Enter Second Number : 14
The sum of 23+14=37
```

21. Now write a program called multiply.cs that will multiply two numbers that is inputted and output the result (***** is multiply and **/** is divide)

```
// Processing
 result=firstnumber*secondnumber;
// Output
```

```
Multiple Program

Enter First Number  : 8
Enter Second Number : 9
The sum of 8*9=72
```

22. Now your week2 folder should look like the below

```
26/09/2023  20:49               293 helloprogram.cs
26/09/2023  21:21             4,096 helloprogram.exe
26/09/2023  21:52               722 multiply.cs
26/09/2023  21:52             4,096 multiply.exe
26/09/2023  21:45               706 sum.cs
26/09/2023  21:45             4,096 sum.exe
26/09/2023  21:32               460 UserName.cs
26/09/2023  21:32             4,096 username.exe
26/09/2023  21:25               563 variableProgram.cs
26/09/2023  21:26             4,096 variableprogram.exe
```