**PROG1780 – Programming Fundamentals: Fall 2020**

**Assignment 3**

**[Maximum points: 25]**

**This assignment consists of 2 questions – Create a separate Console Application Project for each Question.**

1. In this part of the assignment, you are required to create a C# Console Application project. The project name should be A3Group11P1. For example, a student with first name John and Last name Smith would name the project A3JohnSmithP1.

You are creating a console-based program that allows the user to ~~view a list of numbers~~ and do a few calculations. This program will be ~~shown as a menu with~~ **~~three (3) options~~**. **The menu should be ~~created with a do loop~~.** You may user numbers or letter to represent each option.

**Option 1**

The first option is to display a list of **20** numbers starting at a number the user specifies ; when the option is selected – ~~first ask the user for the starting number~~.

After the user provides this input, all the values should be ~~displayed at once~~ as follows:

* **~~User a for loop~~** to ~~increment~~ through the numbers (beginning with the starting number)
* ~~For each number: multiply the even ones by 7~~ and ~~multiply the odd numbers by 8~~.

**Option 2**

**This option should be created ~~using a while loop~~.** It must ~~display the result of any number the user provides divided by 3~~. The option ~~should begin by asking the user for a number.~~ – the program should then ~~display the result~~ of that number divided by 3.

This process should be repeated until the user ~~types~~ **~~“END”~~** ~~to~~ return ~~to the original menu.~~

*Further explanation*

If the user enters a number, then the result of the number the user enters divided by ~~3 must be printed to the screen.~~ The user will then be ~~asked for input again~~. This continues until the user wishes to end the sequence ~~by entering~~ **~~“END”~~**~~.~~

**Option 3**

The third option is to ~~exit the program.~~

**~~Any invalid option entered by the user should prompt the menu to reappear and ask the same three options.~~**

**Any string entry by the user, in place of the expected numeric value ~~should not crash the program~~.  
~~You must use the appropriate loop for each segment as stated for each question~~**

Your program must:

* 1. ~~Encapsulate the logic of options 1 and 2 each within their own method~~. [2 marks]
  2. The functionality of the menu is correct as described. [2 marks]
  3. Proper error handling. [3 marks]
  4. Adhere to coding standards as described by the course. Marks will be taken off wherever coding standards are not followed.

1. **In this part of the assignment, you are required to create a separate C# Console Application project.** The project name should be A3<FirstName><LastName>P2. For example a student with first name John and Last name Smith would name the project A3JohnSmithP2.

Write a C# (console) program to create an interface that acts as a simple four number calculator. Your program should continue doing calculations until it is closed or exited. [2 Marks]

Instead of a GUI keypad, this calculator will use console input to accept the four numbers to be used in the calculation. This calculator needs to prompt the user for ONE selection of any of these simple math operators: plus, minus, multiply, or divide.

Five (5) inputs will need to be prompted:

1. one for the selected mathematical operation,
2. one for the first input,
3. one for the second input,
4. and one for the third input.
5. and one for the fourth input.

The output will be displayed when the mathematical operation is known and the four inputs (numbers) are entered.

* If the user selects addition (plus) add all numbers together.
* If the user selects subtraction only subtract(minus) the third number from the first number.
* If the user selects division (divide) divide the fourth number by the sum of the first number and the second number (e.g. 4/(1+2)).
* If the user selects multiplication (multiply), multiply only the first and third numbers.

The output will not be editable by the user. After the calculation is executed, the application will display error messages (or other status message), **and can be as you deem appropriate**. [4 marks]

* **The program only needs to run once then exit**
* **This calculator will handle all errors using try/catch statements.** The error message output should display at least 3 different types of error (or status) messages, depending on what the user has done incorrectly**. Your program should be able to catch all possible errors the user may do; it should not crash. [6 marks]**

The format for submitting the assignment is as follows:

1. **eConestoga Submission**: A single compressed (.zip format) archive file containing the entire project folder for each of the programs (Part 1 & Part 2) submitted to eConestoga.
2. **Demonstration of the Programs in Class**: Please ensure all work is uploaded to e-Conestoga before your turn to demonstrate and explain your work.