**Sofia University**
**Department of Mathematics and Informatics**

**Course** : OO Programming with C#.NET
**Date**: October 6, 2020
**Student** Name:

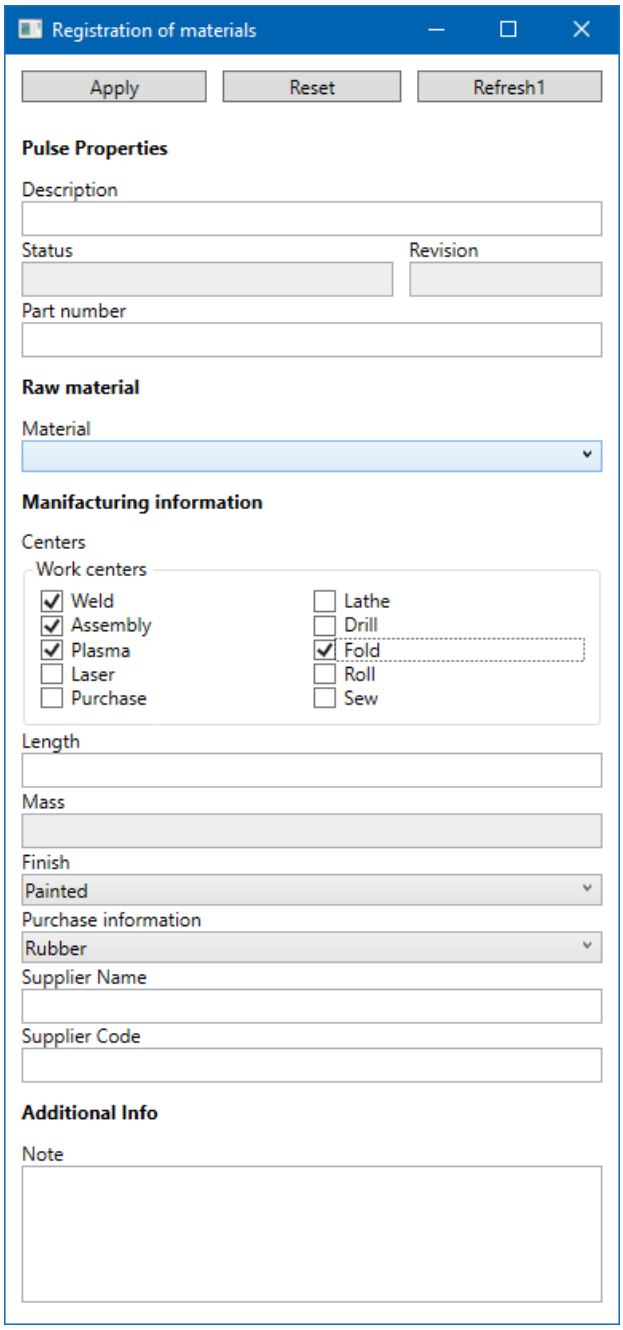
# Lab No. 1a

**Submit the all C# .NET files developed to solve the problems listed below. Use comments and** Modified-Hungarian notation.

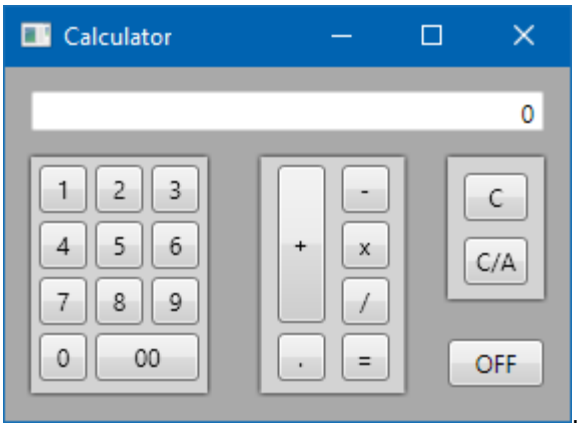
## Problem No. 1

Build the GUIs given in each part of this exercise making use of Blend for Visual Studio. (You need not provide any functionality.) Execute each program, and determine what happens when a control is clicked with the mouse. Drag controls from the **Toolbox** onto the form and resize them as necessary.

a) Design this GUI in a window with size `Height="835" Width="400"`]



b) Create the GUI for the **calculator** as shown below I n a window with `Height="216" and Width="298"`




**Problem No. 2**

Implement the method *Find-median*. The function find-median accepts three irregular values as formal parameters and returns the median of the three numbers. The median of three numbers is the number that is greater than one of the numbers and less than the other number. The median of *10, 30* and *20* is *20*. The median of *5, 5* and *5* is *5*. The median of *12, 20* and *12* is *12*. A call to find-median will take the form:

```
median = Find-median(num1,num2,num3);
```

**Problem No. 3**

A company wants to transmit data over the telephone, but they are concerned that their phones may be tapped. All their data is transmitted as four-digit **Integer**s. They have asked you to write a program that encrypts their data so that it may be transmitted more securely. Your program should read a four-digit **Integer** entered by the user and encrypt it as follows: Replace each digit by *(the sum of that digit plus 7) modulo 10*. Then swap the first digit with the third, and swap the second digit with the fourth. Print the encrypted **Integer**. Write a method that inputs an encrypted four-digit **Integer** and another method that decrypts it to form the original number.

**Problem No. 4**

Write a program that inputs one number consisting of **five** digits from the user, separates the number into its individual digits and prints the digits separated from one another by three spaces each. For example, if the user types in the number **42339**, the program should print

**4 2 3 3 9**

Use the command window for input and output. [*Hint*: You will need to use both and modulus operations to “pick off” each digit.]

**Problem No. 5**

A four- digit number N is used to store genetic information about the four nucleotide bases denoted by each one of the A, C, G and T in terms of the powers of the digit 4.

Let

$$N = \sum_{i=0}^{n} k_i 4^i,$$

where $k_i \in [0, 3]$. Assume, the digits 0, 1, 2 ,3 denote the characters ‘A’, ‘C’,’G’, ‘T’ of the four nucleotide bases. Write a C#.NET application that reads a four digit integer number and outputs its representation in terms of the characters ‘A’, ‘C’,’G’, ‘T’