FORM INTERFACE

Label Control

ARABIC
↑
Name : Arabic Int

Roman numeral
↑
Name : roman Int

introm1
↑
Num value
in roman

num value
in roman
↓
name : introm2

} Label Control

Numeric
Updown Control {
0 △▽ → name : Int 1
0 △▽ → name : Int2

+
↓
Name : addButton

−
↓
Name : SubButton

Button Controll
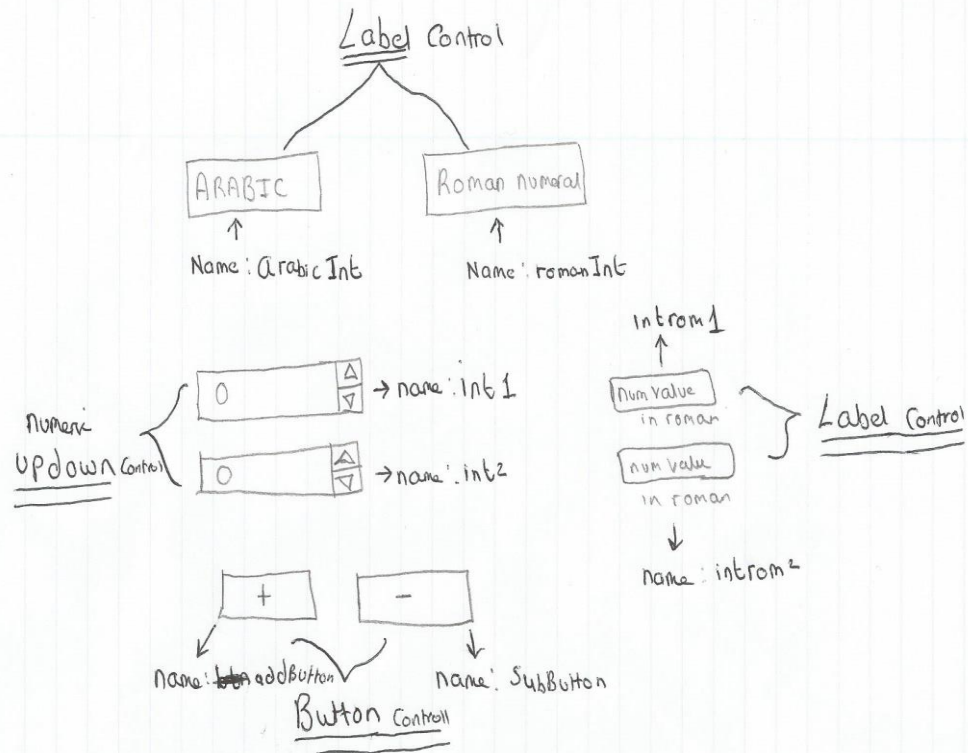
CODING

```vb
Public Class Form1

    Dim output As Integer
```
(DIM variable that we are defining. The variable output that we are going to get is going to be an integer (whole number)

```vb
    Dim roman As String
```
(roman is defined as a string so in our case a list of characters which denotes roman numerals.)

```vb
    Private Sub Label1_Click(sender As System.Object, e As System.EventArgs) Handles arabicInt.Click

    End Sub

    Private Sub NumericUpDown1_ValueChanged(sender As System.Object, e As System.EventArgs) Handles int1.ValueChanged

    End Sub
```
(here the numericbox has been assigned name as int1.)

```vb
    Private Sub addButton_Click(sender As System.Object, e As System.EventArgs) Handles addButton.Click
        output = int1.Value + int2.Value
        roman = ""
```
(when you use the button function, the addition one is this case, the output value will be integers 1 value plus integers 2 value. In our case the integers values 1 and 2 are assigned to the numericbox. So whatever value is in their will be our output values. The roman value is defined to show strings characters so once we set our values the roman numerals will correspond to whatever we assign to it. Below we set our roman numerals values)

```vb
        If output < 0 Then
            output = 0
        End If
        If output > 5000 Then
            output = 0
        End If
```
(this is our loop statement, where it goes through each statement until required result is satisfied. For example, the above loop states any value that is less than 0 will be shown to the user as 0. If that's not the case it moves onto the next statement, where any output value over 5000 will be shown as 0.)

```vb
        arabicInt.Text = output
```

(this sets the arabicint to the value of the output, hence the 2 values from integer 1 and 2 will be shown under the Arabic label box)

```vb
        While output >= 1000
```
(when the output is greater than or equal to 1000 the roman numeral will be assigned M value.)

```vb
            roman = roman + "M"
```
(this denotes what the roman value will be. It can be any roman numeral that satisfies the input data plus M that will be shown as the value.)
```vb
            output = output - 1000
```
(Takes away 1000 from the output so the while loop can find what the next number is going to be)

```
End While
```
(ends the while loop)

```
        While output >= 900
            roman = roman + "CM"
            output = output - 900
```

(takes away 900 from the output because this is the assigned value CM in roman numerals.)

(Loop continues for each value stated and their corresponding roman numeral value is assigned to that.eg below output is greater than or equal to 500 roman numerals will be D)
```
        End While
        While output >= 500
            roman = roman + "D"
            output = output - 500
        End While
        While output >= 400
            roman = roman + "CD"
            output = output - 400
        End While
        While output >= 100
            roman = roman + "C"
            output = output - 100
        End While
        While output >= 90
            roman = roman + "XC"
            output = output - 90
        End While
        While output >= 50
            roman = roman + "L"
            output = output - 50
        End While
        While output >= 40
            roman = roman + "XL"
            output = output - 40
        End While
        While output >= 10
            roman = roman + "X"
            output = output - 10
        End While
        While output >= 9
            roman = roman + "IX"
            output = output - 9
        End While
        While output >= 5
            roman = roman + "V"
            output = output - 5
        End While
        While output >= 4
            roman = roman + "IV"
            output = output - 4
        End While
        While output >= 1
            roman = roman + "I"
            output = output - 1
        End While
        romanInt.Text = roman

    End Sub
```

```vbnet
    Private Sub Form1_Load(sender As System.Object, e As System.EventArgs) Handles
MyBase.Load

    End Sub

    Private Sub subButton_Click(sender As System.Object, e As System.EventArgs)
Handles subButton.Click
(this will handle the values for when we minus the numbers together.)

        output = int1.Value - int2.Value
        roman = ""
        If output < 0 Then
            output = 0
        End If
        If output > 5000 Then
            output = 0
        End If
        arabicInt.Text = output
        While output >= 1000
            roman = roman + "M"
            output = output - 1000
        End While
        While output >= 900
            roman = roman + "CM"
            output = output - 900
        End While
        While output >= 500
            roman = roman + "D"
            output = output - 500
        End While
        While output >= 400
            roman = roman + "CD"
            output = output - 400
        End While
        While output >= 100
            roman = roman + "C"
            output = output - 100
        End While
        While output >= 90
            roman = roman + "XC"
            output = output - 90
        End While
        While output >= 50
            roman = roman + "L"
            output = output - 50
        End While
        While output >= 40
            roman = roman + "XL"
            output = output - 40
        End While
        While output >= 10
            roman = roman + "X"
            output = output - 10
        End While
        While output >= 9
            roman = roman + "IX"
            output = output - 9
        End While
        While output >= 5
            roman = roman + "V"
```

```
        output = output - 5
    End While
    While output >= 4
        roman = roman + "IV"
        output = output - 4
    End While
    While output >= 1
        roman = roman + "I"
        output = output - 1
    End While
    romanInt.Text = roman
End Sub
End Class
```

TESTING TABLE:

Test Number	Description of test	Test Data	Expected outcome	Actual Outcome
1	ADDING 2 VALID NUMBERS	NUMBERS 50 +22	72 LXXII	FIGURE 1
2	ADDING VALID 2ND NUMBER	1+2	3 III	FIGURE 2
3	VALID SUBTRACTION	10-5	5 V	FIGURE 3
4	SUBTRACTION EQUAL 0	52-52	0	FIGURE 4
5	SUBTRACTION LESS THAN 0	79-99	0	FIGURE 5

FIGURE 1: ADDING 2 NUMBERS (VALID 1ST NUMBER)
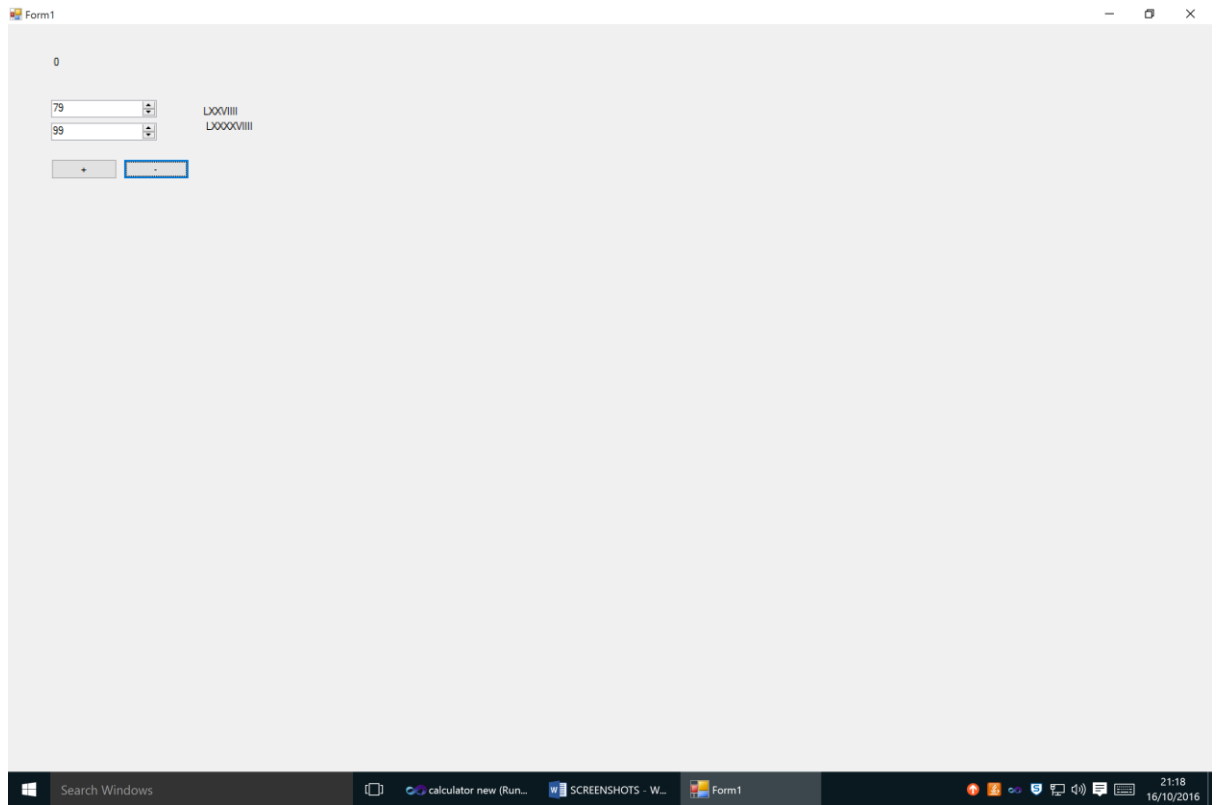

FIGURE 2:   VALID 2ND NUMBER

FIGURE 3: VALID SUBTRACTION

FIGURE 4: SUBTRACTION = 0

FIGURE 5: SUBTRACTION LESS THAN 0