Universitatea Tehnica din Moldova

Raport

la lucrarea de laborator nr. 3
la disciplina "MIDPS"

GUI Calculator

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Obiectivele lucrarii

- Realizeaza un simplu GUI Calculator
- Operatiile simple: +,-,*,/,putere,radical,InversareSemn(+/-),operatii cu numere zecimale.
- Divizare proiectului in doua module - Interfata grafica(Modul GUI) si Modulul de baza(Core Module).

Sarcina lucrarii

Advanced level:

- Realizeaza un simplu GUI calculator care suporta urmatoare functii: +, -, /, *, putere, radical, InversareSemn(+/-), operatii cu numere zecimale.
- Divizare proiectului in doua module - Interfata grafica(Modul GUI) si Modulul de baza(Core Module).

1 Listingul

1.1 Modul GUI

Modul GUI va fi encapsulat in clasa Form1.

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;
using GUICalc.CalcCore;

namespace GUICalc
```

```
{
    public partial class Form1 : Form
    {
        public bool prevOp = false;
        public bool singleOp = false;
        public bool prevEq = false;
        public Form1()
        {
            InitializeComponent();
        }

        private void Form1_Load(object sender, EventArgs e)
        {
            field.TextAlign = HorizontalAlignment.Right;
        }

        private void Form1_Shown(object sender, EventArgs e)
        {

        }

        private void button2_Click(object sender, EventArgs e)
        {
            putNum(0);
        }

        private void putNum(int num)
        {
            if (field.Text.Equals("0") || prevOp ||
            singleOp || prevEq)
                field.Text = "" + num;
            else field.Text = field.Text + num + "";
            prevOp = false;
            singleOp = false;
            prevEq = false;
        }

        private void plus_Click(object sender, EventArgs e)
```

```
{
    prevEq = false;
    double d;
    Double.TryParse(field.Text, out d);
    if (prevOp == false)
    {
        Processor.setVal(d);
        setText("" + Processor.mem1);
    }
    Processor.curOp = Processor.operations.plus;
    prevOp = true;
}

private void c_Click(object sender, EventArgs e)
{
    prevEq = false;
    field.Text = "0";
    prevOp = false;
    Processor.mem1 = Processor.mem2 = 0;
    Processor.v1 = Processor.v2 = false;
    Processor.curOp = Processor.operations.none;
}

private void val1_Click(object sender, EventArgs e)
{
    putNum(1);
}

private void val2_Click(object sender, EventArgs e)
{
    putNum(2);
}

private void val3_Click(object sender, EventArgs e)
{
    putNum(3);
}
```

```
        private void val4_Click(object sender, EventArgs e)
        {
            putNum(4);
        }

        private void val5_Click(object sender, EventArgs e)
        {
            putNum(5);
        }

        private void val6_Click(object sender, EventArgs e)
        {
            putNum(6);
        }

        private void val7_Click(object sender, EventArgs e)
        {
            putNum(7);
        }

        private void val8_Click(object sender, EventArgs e)
        {
            putNum(8);
        }

        private void val9_Click(object sender, EventArgs e)
        {
            putNum(9);
        }

        private void equ_Click(object sender, EventArgs e)
        {
            double d;
            if (prevEq == true)
            {
                Console.WriteLine("SECOND = " + Processor.mem1 + "
" + Processor.mem2);
                Double.TryParse(field.Text, out d);
```

```
            Processor.mem1 = d;
            if (Processor.curOp != Processor.operations.none)
                setText(Processor.getResult(Processor.curOp)
                + "");
            return;
        }
        Double.TryParse(field.Text, out d);
        Processor.mem2 = d;
        if (Processor.curOp != Processor.operations.none)
        setText(Processor.getResult(Processor.curOp)
        + "");
        Processor.v1 = Processor.v2 = false;
        prevOp = false;
        prevEq = true;
    }

    private void div_Click(object sender, EventArgs e)
    {
        prevEq = false;
        double d;
        Double.TryParse(field.Text, out d);
        if (prevOp == false)
        {
            Processor.setVal(d);
            setText("" + Processor.mem1);
        }
        Processor.curOp = Processor.operations.div;
        prevOp = true;
    }

    private void mult_Click(object sender, EventArgs e)
    {
        prevEq = false;
        double d;
        Double.TryParse(field.Text, out d);
        if (prevOp == false)
        {
            Processor.setVal(d);
```

```
            setText("" + Processor.mem1);
        }
        Processor.curOp = Processor.operations.mult;
        prevOp = true;
    }

    private void minus_Click(object sender, EventArgs e)
    {
        prevEq = false;
        double d;
        Double.TryParse(field.Text, out d);
        if (prevOp == false)
        {
            Processor.setVal(d);
            setText("" + Processor.mem1);
        }
        Processor.curOp = Processor.operations.minus;
        prevOp = true;
    }

    private void sqrt_Click(object sender, EventArgs e)
    {
        Console.WriteLine("BC = "+field.Text);
        if (prevEq == false)
            equ.PerformClick();
        Console.WriteLine("AC = " + field.Text);
        singleOp = true;
        prevEq = false;
        Processor.curOp = Processor.operations.sqrt;
        double d;
        Double.TryParse(field.Text, out d);
        Console.WriteLine("PARSED " + d);
        Processor.mem1 = d;
        setText("" + Processor.getResult(Processor.curOp));
        Processor.curOp = Processor.operations.none;
    }

    private void inv_Click(object sender, EventArgs e)
```

```
{
    if (prevEq == false)
    equ.PerformClick();
    singleOp = true;
    prevEq = false;
    Processor.curOp = Processor.operations.inv;
    double d;
    Double.TryParse(field.Text, out d);
    Processor.mem1 = d;
    field.Text = "" + Processor.getResult(Processor.curOp);
    setText("" + Processor.getResult(Processor.curOp));
    Processor.curOp = Processor.operations.none;
}

private void pow_Click(object sender, EventArgs e)
{
    prevEq = false;
    double d;
    Double.TryParse(field.Text, out d);
    if (prevOp == false)
    {
        Processor.setVal(d);
        setText("" + Processor.mem1);
    }
    Processor.curOp = Processor.operations.pow;
    prevOp = true;
}

private void dot_Click(object sender, EventArgs e)
{
    prevEq = false;
    if (field.Text.Contains(",")) return;
    if (field.Text.Equals("0") || prevOp)
        setText("0,");
    else setText(field.Text + ",");
    prevOp = false;
}
```

```
        private void setText(String s)
        {
            if (Double.IsNaN(Processor.last))
            {
                field.Text = "Invalid operation";
                Processor.last = 0;
            }
            else if (Double.IsNegativeInfinity(Processor.last)
            || Double.IsPositiveInfinity(Processor.last))
            {
                field.Text = "Division by zero is not allowed";
                Processor.last = 0;
            }
            else field.Text = s;
            if (field.Text.Contains("-0"))
                field.Text = "0";
        }
    }
}
```

1.2 Modul Core

Modul de baza (Core Module) va fi encapsulat in clasa Processor

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace GUICalc.CalcCore
{
    public abstract class Processor
    {
        public static double mem1 = 0;
        public static double mem2 = 0;
        public static bool v1 = false;
```

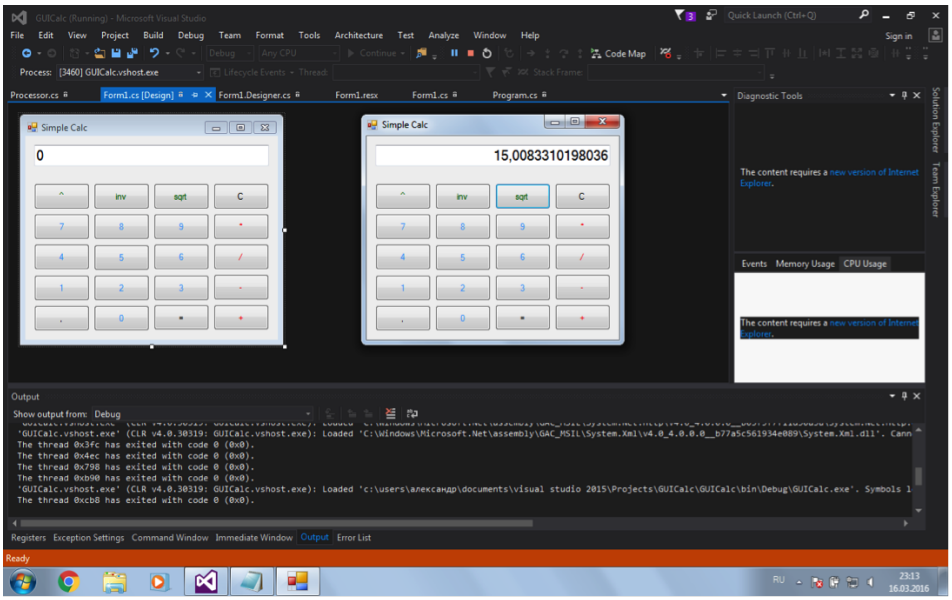
```
public static bool v2 = false;
public static operations curOp;
public static int opCount;
public enum operations {plus, minus, mult, div,
sqrt, pow, inv };

public static double getResult(operations op)
{
    switch (op)
    {
        case operations.plus: return mem1 + mem2;
        case operations.minus: return mem1 - mem2;
        case operations.mult: return mem1*mem2;
        case operations.div: return mem1/mem2;
        case operations.sqrt: return Math.Sqrt(mem1);
        case operations.pow: return Math.Pow(mem1,mem2);
        case operations.inv: return -mem1;
    }
    return 0;
}

public static bool setVal(double val)
{
    if (v1 == false) {
    mem1 = val;
        v1 = true;
        Console.WriteLine("1");
        return false;
    } else
    {
        mem2 = val;
        //v1 = false;
        Console.WriteLine("2");
        mem1 = getResult(curOp);
        mem2 = 0;
        return true;
    }
}
```

```
        }
}
```

2 Rezultatele



Concluzii

In cadrul acestei lucrari de laborator am creat simplu calculator GUI prin intermediul IDE Visual Studio 2015 in limbajul C#. Calculatorul suporta operatiile simple: +,-,*,/,putere,radical,InversareSemn(+/-), operatii cu numere zecimale. Produsul soft realizat poate fi executat nu doar sub Windows, dar si sub alte platforme (Linux, Mac) n cazul n care este instalat Mono Framework, desi aplicatia este de tip cross-platform. Cunostintele obtinute pe parcursul desfasurarii lucrarii de laborator vor fi utile pentru realizarea proiectelor ce urmeaza.

Bibliografie

1. https://msdn.microsoft.com/ru-ru/library/67ef8sbd.aspx - **C# Programming**