Технический университет Молдовы

Анализ и проектирование алгоритмов

**ОТЧЕТ**

ПО ЛАБАРАТОРНОЙ РАБОТЕ №2

*По предмету «Инструменты и среды разработки»*



Работу выполнил: студент группы TI-155

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Проверил: преподаватель MIDPS

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Кишинев 2017

**Задание:**

Создание простого калькулятора на языке программирования C#.

* 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).

Файл Form1.Design.cs

namespace Lab2

{

partial class Form1

{

/// <summary>

/// Требуется переменная конструктора.

/// </summary>

private System.ComponentModel.IContainer components = null;

/// <summary>

/// Освободить все используемые ресурсы.

/// </summary>

/// <param name="disposing">истинно, если управляемый ресурс должен быть удален; иначе ложно.</param>

protected override void Dispose(bool disposing)

{

if (disposing && (components != null))

{

components.Dispose();

}

base.Dispose(disposing);

}

#region Код, автоматически созданный конструктором форм Windows

/// <summary>

/// Обязательный метод для поддержки конструктора - не изменяйте

/// содержимое данного метода при помощи редактора кода.

/// </summary>

private void InitializeComponent()

{

this.button1 = new System.Windows.Forms.Button();

this.button2 = new System.Windows.Forms.Button();

this.button3 = new System.Windows.Forms.Button();

this.button4 = new System.Windows.Forms.Button();

this.button5 = new System.Windows.Forms.Button();

this.button6 = new System.Windows.Forms.Button();

this.button7 = new System.Windows.Forms.Button();

this.button8 = new System.Windows.Forms.Button();

this.button9 = new System.Windows.Forms.Button();

this.button10 = new System.Windows.Forms.Button();

this.button11 = new System.Windows.Forms.Button();

this.button12 = new System.Windows.Forms.Button();

this.button13 = new System.Windows.Forms.Button();

this.button14 = new System.Windows.Forms.Button();

this.button\_sum = new System.Windows.Forms.Button();

this.button\_clear = new System.Windows.Forms.Button();

this.button\_clearall = new System.Windows.Forms.Button();

this.button\_equal = new System.Windows.Forms.Button();

this.result = new System.Windows.Forms.TextBox();

this.invert\_btn = new System.Windows.Forms.Button();

this.SuspendLayout();

//

// button1

//

this.button1.BackColor = System.Drawing.Color.White;

this.button1.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button1.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button1.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button1.Location = new System.Drawing.Point(12, 67);

this.button1.Name = "button1";

this.button1.Size = new System.Drawing.Size(35, 35);

this.button1.TabIndex = 0;

this.button1.Text = "7";

this.button1.UseVisualStyleBackColor = false;

this.button1.Click += new System.EventHandler(this.button\_click);

//

// button2

//

this.button2.BackColor = System.Drawing.Color.White;

this.button2.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button2.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button2.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button2.Location = new System.Drawing.Point(53, 67);

this.button2.Name = "button2";

this.button2.Size = new System.Drawing.Size(35, 35);

this.button2.TabIndex = 1;

this.button2.Text = "8";

this.button2.UseVisualStyleBackColor = false;

this.button2.Click += new System.EventHandler(this.button\_click);

//

// button3

//

this.button3.BackColor = System.Drawing.Color.White;

this.button3.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button3.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button3.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button3.Location = new System.Drawing.Point(94, 67);

this.button3.Name = "button3";

this.button3.Size = new System.Drawing.Size(35, 35);

this.button3.TabIndex = 2;

this.button3.Text = "9";

this.button3.UseVisualStyleBackColor = false;

this.button3.Click += new System.EventHandler(this.button\_click);

//

// button4

//

this.button4.BackColor = System.Drawing.Color.White;

this.button4.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button4.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button4.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button4.Location = new System.Drawing.Point(12, 108);

this.button4.Name = "button4";

this.button4.Size = new System.Drawing.Size(35, 35);

this.button4.TabIndex = 3;

this.button4.Text = "4";

this.button4.UseVisualStyleBackColor = false;

this.button4.Click += new System.EventHandler(this.button\_click);

//

// button5

//

this.button5.BackColor = System.Drawing.Color.White;

this.button5.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button5.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button5.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button5.Location = new System.Drawing.Point(53, 108);

this.button5.Name = "button5";

this.button5.Size = new System.Drawing.Size(35, 35);

this.button5.TabIndex = 4;

this.button5.Text = "5";

this.button5.UseVisualStyleBackColor = false;

this.button5.Click += new System.EventHandler(this.button\_click);

//

// button6

//

this.button6.BackColor = System.Drawing.Color.White;

this.button6.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button6.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button6.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button6.Location = new System.Drawing.Point(94, 108);

this.button6.Name = "button6";

this.button6.Size = new System.Drawing.Size(35, 35);

this.button6.TabIndex = 5;

this.button6.Text = "6";

this.button6.UseVisualStyleBackColor = false;

this.button6.Click += new System.EventHandler(this.button\_click);

//

// button7

//

this.button7.BackColor = System.Drawing.Color.White;

this.button7.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button7.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button7.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button7.Location = new System.Drawing.Point(12, 149);

this.button7.Name = "button7";

this.button7.Size = new System.Drawing.Size(35, 35);

this.button7.TabIndex = 6;

this.button7.Text = "1";

this.button7.UseVisualStyleBackColor = false;

this.button7.Click += new System.EventHandler(this.button\_click);

//

// button8

//

this.button8.BackColor = System.Drawing.Color.White;

this.button8.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button8.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button8.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button8.Location = new System.Drawing.Point(53, 149);

this.button8.Name = "button8";

this.button8.Size = new System.Drawing.Size(35, 35);

this.button8.TabIndex = 7;

this.button8.Text = "2";

this.button8.UseVisualStyleBackColor = false;

this.button8.Click += new System.EventHandler(this.button\_click);

//

// button9

//

this.button9.BackColor = System.Drawing.Color.White;

this.button9.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button9.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button9.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button9.Location = new System.Drawing.Point(94, 149);

this.button9.Name = "button9";

this.button9.Size = new System.Drawing.Size(35, 35);

this.button9.TabIndex = 8;

this.button9.Text = "3";

this.button9.UseVisualStyleBackColor = false;

this.button9.Click += new System.EventHandler(this.button\_click);

//

// button10

//

this.button10.BackColor = System.Drawing.Color.White;

this.button10.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button10.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button10.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button10.Location = new System.Drawing.Point(12, 203);

this.button10.Name = "button10";

this.button10.Size = new System.Drawing.Size(76, 35);

this.button10.TabIndex = 9;

this.button10.Text = "0";

this.button10.UseVisualStyleBackColor = false;

this.button10.Click += new System.EventHandler(this.button\_click);

//

// button11

//

this.button11.BackColor = System.Drawing.Color.White;

this.button11.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button11.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button11.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button11.Location = new System.Drawing.Point(94, 203);

this.button11.Name = "button11";

this.button11.Size = new System.Drawing.Size(35, 35);

this.button11.TabIndex = 10;

this.button11.Text = ",";

this.button11.UseVisualStyleBackColor = false;

this.button11.Click += new System.EventHandler(this.button\_click);

//

// button12

//

this.button12.BackColor = System.Drawing.Color.Azure;

this.button12.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button12.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button12.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button12.Location = new System.Drawing.Point(156, 67);

this.button12.Name = "button12";

this.button12.Size = new System.Drawing.Size(35, 35);

this.button12.TabIndex = 11;

this.button12.Text = "/";

this.button12.UseVisualStyleBackColor = false;

this.button12.Click += new System.EventHandler(this.operation\_click);

//

// button13

//

this.button13.BackColor = System.Drawing.Color.Azure;

this.button13.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button13.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button13.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button13.Location = new System.Drawing.Point(156, 108);

this.button13.Name = "button13";

this.button13.Size = new System.Drawing.Size(35, 35);

this.button13.TabIndex = 12;

this.button13.Text = "\*";

this.button13.UseVisualStyleBackColor = false;

this.button13.Click += new System.EventHandler(this.operation\_click);

//

// button14

//

this.button14.BackColor = System.Drawing.Color.Azure;

this.button14.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button14.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button14.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button14.Location = new System.Drawing.Point(156, 149);

this.button14.Name = "button14";

this.button14.Size = new System.Drawing.Size(35, 35);

this.button14.TabIndex = 13;

this.button14.Text = "-";

this.button14.UseVisualStyleBackColor = false;

this.button14.Click += new System.EventHandler(this.operation\_click);

//

// button\_sum

//

this.button\_sum.BackColor = System.Drawing.Color.Azure;

this.button\_sum.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button\_sum.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button\_sum.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button\_sum.Location = new System.Drawing.Point(156, 203);

this.button\_sum.Name = "button\_sum";

this.button\_sum.Size = new System.Drawing.Size(35, 35);

this.button\_sum.TabIndex = 14;

this.button\_sum.Text = "+";

this.button\_sum.UseVisualStyleBackColor = false;

this.button\_sum.Click += new System.EventHandler(this.operation\_click);

//

// button\_clear

//

this.button\_clear.BackColor = System.Drawing.Color.Azure;

this.button\_clear.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button\_clear.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button\_clear.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold);

this.button\_clear.Location = new System.Drawing.Point(197, 67);

this.button\_clear.Name = "button\_clear";

this.button\_clear.Size = new System.Drawing.Size(52, 35);

this.button\_clear.TabIndex = 15;

this.button\_clear.Text = "CE";

this.button\_clear.UseVisualStyleBackColor = false;

this.button\_clear.Click += new System.EventHandler(this.button\_clear\_Click);

//

// button\_clearall

//

this.button\_clearall.BackColor = System.Drawing.Color.Azure;

this.button\_clearall.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button\_clearall.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button\_clearall.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button\_clearall.Location = new System.Drawing.Point(197, 108);

this.button\_clearall.Name = "button\_clearall";

this.button\_clearall.Size = new System.Drawing.Size(52, 35);

this.button\_clearall.TabIndex = 16;

this.button\_clearall.Text = "C";

this.button\_clearall.UseVisualStyleBackColor = false;

this.button\_clearall.Click += new System.EventHandler(this.clearAll);

//

// button\_equal

//

this.button\_equal.BackColor = System.Drawing.Color.Azure;

this.button\_equal.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.button\_equal.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.button\_equal.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.button\_equal.Location = new System.Drawing.Point(197, 203);

this.button\_equal.Name = "button\_equal";

this.button\_equal.Size = new System.Drawing.Size(52, 35);

this.button\_equal.TabIndex = 17;

this.button\_equal.Text = "=";

this.button\_equal.UseVisualStyleBackColor = false;

this.button\_equal.Click += new System.EventHandler(this.button\_equal\_Click);

//

// result

//

this.result.Font = new System.Drawing.Font("Microsoft Sans Serif", 15.75F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.result.Location = new System.Drawing.Point(12, 21);

this.result.Name = "result";

this.result.Size = new System.Drawing.Size(237, 31);

this.result.TabIndex = 18;

this.result.Text = "0";

this.result.TextAlign = System.Windows.Forms.HorizontalAlignment.Right;

//

// invert\_btn

//

this.invert\_btn.BackColor = System.Drawing.Color.Azure;

this.invert\_btn.FlatAppearance.BorderColor = System.Drawing.Color.Silver;

this.invert\_btn.FlatStyle = System.Windows.Forms.FlatStyle.Flat;

this.invert\_btn.Font = new System.Drawing.Font("Microsoft Sans Serif", 12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.invert\_btn.Location = new System.Drawing.Point(197, 149);

this.invert\_btn.Name = "invert\_btn";

this.invert\_btn.Size = new System.Drawing.Size(52, 35);

this.invert\_btn.TabIndex = 19;

this.invert\_btn.Text = "+-";

this.invert\_btn.UseVisualStyleBackColor = false;

this.invert\_btn.Click += new System.EventHandler(this.invert);

//

// Form1

//

this.AutoScaleDimensions = new System.Drawing.SizeF(6F, 13F);

this.AutoScaleMode = System.Windows.Forms.AutoScaleMode.Font;

this.BackColor = System.Drawing.Color.PaleTurquoise;

this.ClientSize = new System.Drawing.Size(272, 255);

this.Controls.Add(this.invert\_btn);

this.Controls.Add(this.result);

this.Controls.Add(this.button\_equal);

this.Controls.Add(this.button\_clearall);

this.Controls.Add(this.button\_clear);

this.Controls.Add(this.button\_sum);

this.Controls.Add(this.button14);

this.Controls.Add(this.button13);

this.Controls.Add(this.button12);

this.Controls.Add(this.button11);

this.Controls.Add(this.button10);

this.Controls.Add(this.button9);

this.Controls.Add(this.button8);

this.Controls.Add(this.button7);

this.Controls.Add(this.button6);

this.Controls.Add(this.button5);

this.Controls.Add(this.button4);

this.Controls.Add(this.button3);

this.Controls.Add(this.button2);

this.Controls.Add(this.button1);

this.Name = "Form1";

this.StartPosition = System.Windows.Forms.FormStartPosition.CenterScreen;

this.Text = "Form1";

this.Load += new System.EventHandler(this.Form1\_Load);

this.Enter += new System.EventHandler(this.button\_equal\_Click);

this.KeyPress += new System.Windows.Forms.KeyPressEventHandler(this.pressing);

this.ResumeLayout(false);

this.PerformLayout();

}

#endregion

private System.Windows.Forms.Button button1;

private System.Windows.Forms.Button button2;

private System.Windows.Forms.Button button3;

private System.Windows.Forms.Button button4;

private System.Windows.Forms.Button button5;

private System.Windows.Forms.Button button6;

private System.Windows.Forms.Button button7;

private System.Windows.Forms.Button button8;

private System.Windows.Forms.Button button9;

private System.Windows.Forms.Button button10;

private System.Windows.Forms.Button button11;

private System.Windows.Forms.Button button12;

private System.Windows.Forms.Button button13;

private System.Windows.Forms.Button button14;

private System.Windows.Forms.Button button\_sum;

private System.Windows.Forms.Button button\_clear;

private System.Windows.Forms.Button button\_clearall;

private System.Windows.Forms.Button button\_equal;

private System.Windows.Forms.TextBox result;

private System.Windows.Forms.Button invert\_btn;

}

}

Файл Form1.cs

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;

namespace Lab2

{

public partial class Form1 : Form

{

private double memory = 0;

private string actionForResult = "";

private double number = 0;

private Boolean operation = false;

public Form1()

{

InitializeComponent();

this.KeyPreview = true;

}

private void button\_click(object sender, EventArgs e)

{

Button b = (Button)sender;

if (result.Text == "0")

result.Clear();

result.Text += b.Text;

}

private void button\_clear\_Click(object sender, EventArgs e)

{

result.Text = "0";

}

private void button\_equal\_Click(object sender, EventArgs e)

{

if(this.operation) this.number = Convert.ToDouble(result.Text);

if (this.actionForResult.Equals("+")) this.memory += this.number;

if (this.actionForResult.Equals("-")) this.memory -= this.number;

if (this.actionForResult.Equals("\*")) this.memory \*= this.number;

if (this.actionForResult.Equals("/")) this.memory /= this.number;

this.operation = false;

result.Text = Convert.ToString(this.memory);

}

private void clearAll(object sender, EventArgs e)

{

this.number = 0;

this.actionForResult = "";

this.memory = 0;

result.Text = "0";

}

private void get\_operation(object sender, EventArgs e, String text)

{

this.number = Convert.ToDouble(result.Text);

this.memory = this.number;

this.actionForResult = text;

this.button\_clear\_Click(sender, e);

this.operation = true;

}

private void operation\_click(object sender, EventArgs e)

{

Button b = (Button)sender;

get\_operation(sender, e, b.Text);

}

private void invert(object sender, EventArgs e)

{

result.Text = Convert.ToString(-1\*Convert.ToDouble(result.Text));

}

private void pressing(object sender, KeyPressEventArgs e)

{

if (e.KeyChar == 42 || e.KeyChar == 43 || e.KeyChar == 45 || e.KeyChar == 47)

{

get\_operation(sender, e, e.KeyChar.ToString());

return;

}

if ((e.KeyChar >= 48 && e.KeyChar <= 57)||e.KeyChar==44)

{

if (result.Text == "0")

result.Clear();

result.Text += e.KeyChar.ToString();

}

}

}

}

Файл Program.cs

using System;

using System.Collections.Generic;

using System.Linq;

using System.Threading.Tasks;

using System.Windows.Forms;

namespace Lab2

{

static class Program

{

/// <summary>

/// Главная точка входа для приложения.

/// </summary>

[STAThread]

static void Main()

{

Application.EnableVisualStyles();

Application.SetCompatibleTextRenderingDefault(false);

Application.Run(new Form1());

}

}

}

**Вывод:**

В ходе проделанной работы я познакомился с языком программирования C#. Созданный мной калькулятор позволяет выполнять элементарные арифметические функции такие как: сложение и вычитание, умножение и деление. Помимо того, у него есть возможность инверсии числа и удаление данных введенных на экране. Также был реализован ввод данных с клавиатуры, а не только нажатием на клавиши калькулятора.