**Пермский национальный исследовательский политехнический университет**

Кафедра “Информационные технологии и автоматизированные системы”

**Творческая работа**

По дисциплине «Основы алгоритмизации и программирования»

**Тема:**

Разработка калькулятора

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Пермь, 2020

**Постановка задачи**

|  |  |
| --- | --- |
| Обыкновенные и десятичные дроби. | Сложение, вычитание, умножение, деление, преобразование десятичной дроби в обыкновенную и обратно, отмена последней операции, сброс результата. |

**Код**

MyForm.cpp

#include "MyForm.h"

#include <vector>

#include <string>

#include <msclr\marshal\_cppstd.h>

using namespace cl;

using namespace std;

Double num;

vector <float> vec{ 0,1,1 };

void main() {

Application::EnableVisualStyles();

Application::SetCompatibleTextRenderingDefault(false);

Application::Run(gcnew MyForm);

}

using namespace System;

System::Void cl::MyForm::textBox1\_KeyPress(System::Object^ sender, System::Windows::Forms::KeyPressEventArgs^ e)

{

char number = e->KeyChar;

if ((e->KeyChar <= 47 || e->KeyChar > 58)&& (e->KeyChar <= 39 || e->KeyChar > 46) && number != 47 && number!=8) //калькулятор

{

e->Handled = true;

}

}

System::Void cl::MyForm::button1\_Click(System::Object^ sender, System::EventArgs^ e)

{

int c = 0;

vec[1] = 1; vec[2] = 1;

String^ dl = textBox1->Text;

string stroka = msclr::interop::marshal\_as<string>(dl);

string res;

//Вычисляем сложение и вычитание

for (int k = 0; k < stroka.size(); k++) {

////

if (k == stroka.size() - 1) { res.push\_back(stroka[k]);

/////

if (c == 1) { vec[1] \*= stof(res); c=0; res = ""; }else

if(c==2){ vec[2] \*= stof(res); c = 0; res = ""; }

else

vec[0] += stof(res);

}

//когда вижу знак плюс

if (stroka[k] == '+') {

if (c == 1) { vec[1] \*= stof(res); c=0; res = ""; }

else if(c==2){ vec[2] \*= stof(res); c = 0; res = ""; }

else {vec[0] += stof(res); res = ""; }

}

else

//Когда вижу знак минус

if ((stroka[k] == '-') && (k != 0)) {

if (c == 1) { vec[1] \*= stof(res); c = 0; res = ""; res.push\_back(stroka[k]); }

else

if (c == 2) { vec[2] \*= stof(res); c = 0; res = ""; res.push\_back(stroka[k]); }

else

{

vec[0] += stof(res); res = ""; res.push\_back(stroka[k]);

}

}

else

//Умножение и деление

if (stroka[k] == '\*') {

if (c == 0) { vec[1] /= vec[2]; vec[0] += vec[1]; vec[2] = 1; vec[1] = 1; }

if (c == 2) {

vec[2] \*= stof(res); res = ""; c = 1;

}

else

{

vec[1] \*= stof(res); res = ""; c = 1;

}

}

else

if (stroka[k] == '/') {

if (c == 0) { vec[1] /= vec[2]; vec[0] += vec[1]; vec[2] = 1; vec[1] = 1; }

if (c == 1) { vec[1] \*= stof(res); res = ""; c = 2; }

else { vec[1] \*= stof(res); res = ""; c = 2; }

}

else

res.push\_back(stroka[k]);

}

////

vec[1] /= vec[2];

vec[0] += vec[1]-1;

vec[1] = 0;

vec[2] = 0;

textBox2->Text = Convert::ToString(vec[0]);

vec[0] = 0;

}

System::Void cl::MyForm::button2\_Click(System::Object^ sender, System::EventArgs^ e)

{

textBox1->Text = ""; textBox2->Text = "";

}

MyForm.h

#pragma once

namespace cl {

using namespace System;

using namespace System::ComponentModel;

using namespace System::Collections;

using namespace System::Windows::Forms;

using namespace System::Data;

using namespace System::Drawing;

/// <summary>

/// Сводка для MyForm

/// </summary>

public ref class MyForm : public System::Windows::Forms::Form

{

public:

MyForm(void)

{

InitializeComponent();

//

//TODO: добавьте код конструктора

//

}

protected:

/// <summary>

/// Освободить все используемые ресурсы.

/// </summary>

~MyForm()

{

if (components)

{

delete components;

}

}

private: System::Windows::Forms::Button^ button2;

private: System::Windows::Forms::TextBox^ textBox1;

private: System::Windows::Forms::Button^ button1;

private: System::Windows::Forms::TextBox^ textBox2;

private: System::Windows::Forms::Label^ label1;

private: System::Windows::Forms::Label^ label2;

protected:

private:

/// <summary>

/// Обязательная переменная конструктора.

/// </summary>

System::ComponentModel::Container ^components;

#pragma region Windows Form Designer generated code

/// <summary>

/// Требуемый метод для поддержки конструктора — не изменяйте

/// содержимое этого метода с помощью редактора кода.

/// </summary>

void InitializeComponent(void)

{

this->button2 = (gcnew System::Windows::Forms::Button());

this->textBox1 = (gcnew System::Windows::Forms::TextBox());

this->button1 = (gcnew System::Windows::Forms::Button());

this->textBox2 = (gcnew System::Windows::Forms::TextBox());

this->label1 = (gcnew System::Windows::Forms::Label());

this->label2 = (gcnew System::Windows::Forms::Label());

this->SuspendLayout();

//

// button2

//

this->button2->Location = System::Drawing::Point(12, 165);

this->button2->Name = L"button2";

this->button2->Size = System::Drawing::Size(154, 47);

this->button2->TabIndex = 1;

this->button2->Text = L"Сброс";

this->button2->UseVisualStyleBackColor = true;

this->button2->Click += gcnew System::EventHandler(this, &MyForm::button2\_Click);

//

// textBox1

//

this->textBox1->Font = (gcnew System::Drawing::Font(L"Microsoft Sans Serif", 9.75F, System::Drawing::FontStyle::Regular, System::Drawing::GraphicsUnit::Point,

static\_cast<System::Byte>(204)));

this->textBox1->Location = System::Drawing::Point(12, 39);

this->textBox1->Multiline = true;

this->textBox1->Name = L"textBox1";

this->textBox1->Size = System::Drawing::Size(342, 38);

this->textBox1->TabIndex = 9;

this->textBox1->KeyPress += gcnew System::Windows::Forms::KeyPressEventHandler(this, &MyForm::textBox1\_KeyPress);

//

// button1

//

this->button1->Location = System::Drawing::Point(199, 165);

this->button1->Name = L"button1";

this->button1->Size = System::Drawing::Size(155, 47);

this->button1->TabIndex = 0;

this->button1->Text = L"=";

this->button1->UseVisualStyleBackColor = true;

this->button1->Click += gcnew System::EventHandler(this, &MyForm::button1\_Click);

//

// textBox2

//

this->textBox2->Font = (gcnew System::Drawing::Font(L"Microsoft Sans Serif", 9.75F, System::Drawing::FontStyle::Regular, System::Drawing::GraphicsUnit::Point,

static\_cast<System::Byte>(204)));

this->textBox2->Location = System::Drawing::Point(12, 106);

this->textBox2->Multiline = true;

this->textBox2->Name = L"textBox2";

this->textBox2->ReadOnly = true;

this->textBox2->Size = System::Drawing::Size(342, 38);

this->textBox2->TabIndex = 10;

//

// label1

//

this->label1->AutoSize = true;

this->label1->Font = (gcnew System::Drawing::Font(L"Microsoft Sans Serif", 14.25F, System::Drawing::FontStyle::Regular, System::Drawing::GraphicsUnit::Point,

static\_cast<System::Byte>(204)));

this->label1->ForeColor = System::Drawing::Color::FromArgb(static\_cast<System::Int32>(static\_cast<System::Byte>(192)), static\_cast<System::Int32>(static\_cast<System::Byte>(192)),

static\_cast<System::Int32>(static\_cast<System::Byte>(255)));

this->label1->Location = System::Drawing::Point(12, 80);

this->label1->Name = L"label1";

this->label1->Size = System::Drawing::Size(72, 24);

this->label1->TabIndex = 13;

this->label1->Text = L"Ответ:";

//

// label2

//

this->label2->AutoSize = true;

this->label2->ForeColor = System::Drawing::Color::FromArgb(static\_cast<System::Int32>(static\_cast<System::Byte>(192)), static\_cast<System::Int32>(static\_cast<System::Byte>(192)),

static\_cast<System::Int32>(static\_cast<System::Byte>(255)));

this->label2->Location = System::Drawing::Point(12, 23);

this->label2->Name = L"label2";

this->label2->Size = System::Drawing::Size(346, 13);

this->label2->TabIndex = 14;

this->label2->Text = L"Возможные операции: деление, умножение, сложение, вычитание";

//

// MyForm

//

this->AutoScaleDimensions = System::Drawing::SizeF(6, 13);

this->AutoScaleMode = System::Windows::Forms::AutoScaleMode::Font;

this->BackColor = System::Drawing::Color::Indigo;

this->ClientSize = System::Drawing::Size(366, 232);

this->Controls->Add(this->label2);

this->Controls->Add(this->label1);

this->Controls->Add(this->textBox2);

this->Controls->Add(this->textBox1);

this->Controls->Add(this->button2);

this->Controls->Add(this->button1);

this->MaximizeBox = false;

this->MaximumSize = System::Drawing::Size(382, 271);

this->MinimumSize = System::Drawing::Size(382, 271);

this->Name = L"MyForm";

this->StartPosition = System::Windows::Forms::FormStartPosition::CenterScreen;

this->Text = L"Calc";

this->ResumeLayout(false);

this->PerformLayout();

}

#pragma endregion

private: System::Void button1\_Click(System::Object^ sender, System::EventArgs^ e);

private: System::Void button2\_Click(System::Object^ sender, System::EventArgs^ e);

private: System::Void textBox1\_KeyPress(System::Object^ sender, System::Windows::Forms::KeyPressEventArgs^ e);

};

}

**Тестирование**

