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**Міністерство освіти і науки України**

**Національний технічний університет**

**«Дніпровська політехніка»**

****

**ЗВІТ**

**про виконання лабораторних робіт**

**з дисципліни**

# «Програмування та алгоритмічні мови»

**Лабораторна робота № 6**

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**Дніпро**

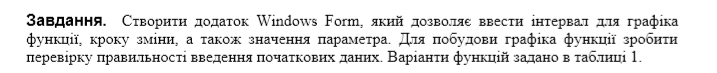
**2020**

Звіт

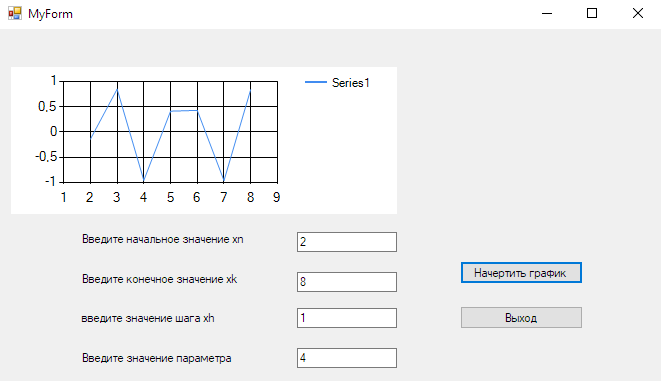
1)Лабораторна робота №6

## 2) Побудова графіка функції в Microsoft Visual Studio

3)Варіант №12







#pragma once

namespace Project5 {

using namespace System;

using namespace System::ComponentModel;

using namespace System::Collections;

using namespace System::Windows::Forms;

using namespace System::Data;

using namespace System::Drawing;

using namespace System::Windows::Forms::DataVisualization::Charting;

#include "math.h"

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

{

public:

MyForm(void)

{

InitializeComponent();

}

protected:

/// <summary>

/// Освободить все используемые ресурсы.

/// </summary>

~MyForm()

{

if (components)

{

delete components;

}

}

private: System::Windows::Forms::DataVisualization::Charting::Chart^ chart1;

protected:

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

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

private: System::Windows::Forms::TextBox^ textBox3;

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

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

private: System::Windows::Forms::Label^ label3;

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

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

private: System::Windows::Forms::Label^ label4;

private: System::Windows::Forms::TextBox^ textBox4;

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)

{

System::Windows::Forms::DataVisualization::Charting::ChartArea^ chartArea1 = (gcnew System::Windows::Forms::DataVisualization::Charting::ChartArea());

System::Windows::Forms::DataVisualization::Charting::Legend^ legend1 = (gcnew System::Windows::Forms::DataVisualization::Charting::Legend());

System::Windows::Forms::DataVisualization::Charting::Series^ series1 = (gcnew System::Windows::Forms::DataVisualization::Charting::Series());

this->chart1 = (gcnew System::Windows::Forms::DataVisualization::Charting::Chart());

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

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

this->textBox3 = (gcnew System::Windows::Forms::TextBox());

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

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

this->label3 = (gcnew System::Windows::Forms::Label());

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

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

this->label4 = (gcnew System::Windows::Forms::Label());

this->textBox4 = (gcnew System::Windows::Forms::TextBox());

(cli::safe\_cast<System::ComponentModel::ISupportInitialize^>(this->chart1))->BeginInit();

this->SuspendLayout();

//

// chart1

//

chartArea1->Name = L"ChartArea1";

this->chart1->ChartAreas->Add(chartArea1);

legend1->Name = L"Legend1";

this->chart1->Legends->Add(legend1);

this->chart1->Location = System::Drawing::Point(12, 38);

this->chart1->Name = L"chart1";

series1->ChartArea = L"ChartArea1";

series1->ChartType = System::Windows::Forms::DataVisualization::Charting::SeriesChartType::Line;

series1->Legend = L"Legend1";

series1->Name = L"Series1";

this->chart1->Series->Add(series1);

this->chart1->Size = System::Drawing::Size(386, 147);

this->chart1->TabIndex = 0;

this->chart1->Text = L"chart1";

//

// textBox1

//

this->textBox1->Location = System::Drawing::Point(298, 203);

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

this->textBox1->Size = System::Drawing::Size(100, 20);

this->textBox1->TabIndex = 1;

//

// textBox2

//

this->textBox2->Location = System::Drawing::Point(298, 243);

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

this->textBox2->Size = System::Drawing::Size(100, 20);

this->textBox2->TabIndex = 2;

//

// textBox3

//

this->textBox3->Location = System::Drawing::Point(298, 279);

this->textBox3->Name = L"textBox3";

this->textBox3->Size = System::Drawing::Size(100, 20);

this->textBox3->TabIndex = 3;

//

// label1

//

this->label1->AutoSize = true;

this->label1->Location = System::Drawing::Point(80, 203);

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

this->label1->Size = System::Drawing::Size(169, 13);

this->label1->TabIndex = 4;

this->label1->Text = L"Введите начальное значение xn";

//

// label2

//

this->label2->AutoSize = true;

this->label2->Location = System::Drawing::Point(80, 243);

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

this->label2->Size = System::Drawing::Size(163, 13);

this->label2->TabIndex = 5;

this->label2->Text = L"Введите конечное значение xk";

//

// label3

//

this->label3->AutoSize = true;

this->label3->Location = System::Drawing::Point(80, 282);

this->label3->Name = L"label3";

this->label3->Size = System::Drawing::Size(140, 13);

this->label3->TabIndex = 6;

this->label3->Text = L"введите значение шага xh";

//

// button1

//

this->button1->Location = System::Drawing::Point(461, 232);

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

this->button1->Size = System::Drawing::Size(123, 23);

this->button1->TabIndex = 7;

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

this->button1->UseVisualStyleBackColor = true;

this->button1->Click += gcnew System::EventHandler(this, &MyForm::Button1\_Click);

//

// button2

//

this->button2->Location = System::Drawing::Point(461, 277);

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

this->button2->Size = System::Drawing::Size(123, 23);

this->button2->TabIndex = 8;

this->button2->Text = L"Выход";

this->button2->UseVisualStyleBackColor = true;

this->button2->Click += gcnew System::EventHandler(this, &MyForm::Button2\_Click);

//

// label4

//

this->label4->AutoSize = true;

this->label4->Location = System::Drawing::Point(80, 322);

this->label4->Name = L"label4";

this->label4->Size = System::Drawing::Size(157, 13);

this->label4->TabIndex = 9;

this->label4->Text = L"Введите значение параметра";

//

// textBox4

//

this->textBox4->Location = System::Drawing::Point(298, 319);

this->textBox4->Name = L"textBox4";

this->textBox4->Size = System::Drawing::Size(100, 20);

this->textBox4->TabIndex = 10;

//

// MyForm

//

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

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

this->ClientSize = System::Drawing::Size(662, 354);

this->Controls->Add(this->textBox4);

this->Controls->Add(this->label4);

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

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

this->Controls->Add(this->label3);

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

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

this->Controls->Add(this->textBox3);

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

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

this->Controls->Add(this->chart1);

this->Name = L"MyForm";

this->Text = L"MyForm";

(cli::safe\_cast<System::ComponentModel::ISupportInitialize^>(this->chart1))->EndInit();

this->ResumeLayout(false);

this->PerformLayout();

}

#pragma endregion

private: System::Void Button1\_Click(System::Object^ sender, System::EventArgs^ e)

{

double x, xn, xk, xh, a;

Series^ plot1 = chart1->Series[0];

plot1->Points->Clear();

if ((textBox1->Text != "") && (textBox2->Text != "") && (textBox3->Text != "") && (textBox4->Text != ""))

{

xn = Convert::ToDouble(textBox1->Text);

xk = Convert::ToDouble(textBox2->Text);

xh = Convert::ToDouble(textBox3->Text);

a = Convert::ToDouble(textBox4->Text);

if ((xn >= xk) || (xh > (xk - xn)) ||(a<1)||(a>5))

{

MessageBox::Show("Данные заполнены неверно", "Ошибка ввода данных", MessageBoxButtons::OK, MessageBoxIcon::Exclamation);

}

else

{

x = xn;

while (x <= xk)

{

plot1->Points->AddXY(x, cos(a\*x));

x = x + xh;

}

}

}

else

{

MessageBox::Show("Заполните пожалуйста данные", "Ошибка ввода данных", MessageBoxButtons::OK, MessageBoxIcon::Exclamation);

}

}

private: System::Void Button2\_Click(System::Object^ sender, System::EventArgs^ e) {

Application::Exit();

}

};

}