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Федеральное государственное автономное образовательное учреждения высшего образования

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Институт компьютерных технологий и информационной безопасности

Кафедра математического обеспечения и применения ЭВМ

**ЛАБОРАТОРНАЯ РАБОТА № 5-6**

по дисциплине

**«Объектно-ориентированное программирование»**

на тему:

**«Классы, объекты, наследование в C# и создание графического интерфейса»**

*Вариант № 6*

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«\_\_\_\_» \_\_\_\_\_\_\_\_\_\_\_\_\_ 2020 г.

Таганрог 2020

# **1 ФОРМУЛИРОВКА ЗАДАНИЯ**

Создать класс Triangle (треугольник), задав в нем длины двух сторон и угол между ними. Реализовать методы вычисления площади и периметра. На его основе создать классы, описывающие равносторонний, равнобедренный и прямоугольный треугольники с присущими им методами вычисления площади и периметра.

Разработать графический интерфейс с использованием данного класса.

# **2 СПЕЦИФИКАЦИЯ КЛАССОВ**

public abstract class ITriangle

{

public abstract double Perimeter();

public abstract double Area();

public abstract double GetSide(int num);

public abstract int GetAngle();

}

public abstract class BaseTriangle : ITriangle

{

public override double Perimeter();

public override double Area();

public override int GetAngle();

public override double GetSide(int num);

}

public class RightTriangle : BaseTriangle

{

public override double Perimeter();

public override double Area();

public override double GetSide(int num);

public override int GetAngle();

public RightTriangle();

public RightTriangle(int fSide, int sSide);

private int \_fSide;

private int \_sSide;

}

public class IsoscelesTriangle : BaseTriangle

{

public override double Perimeter();

public override double Area();

public override double GetSide(int num);

public override int GetAngle();

public IsoscelesTriangle();

public IsoscelesTriangle(int side, int angle);

private int \_side;

private int \_angle;

}

public class EquilateralTriangle : BaseTriangle

{

public override double Perimeter();

public override double Area();

public override double GetSide(int num);

public override int GetAngle();

public EquilateralTriangle();

public EquilateralTriangle(int side);

private int \_side;

}

class FactoryTriangle

{

public static ITriangle CreateObject(int fSide, int sSide, int angle);

}

public partial class FormEnterParents : Form

{

private readonly float[] \_pFirst = { 105, 105 };

private float[] \_pTriangle1 = new float[3];

private float[] \_pTriangle2 = new float[3];

private readonly Pen \_blackPen = new Pen(Color.Black, 2);

private int[] \_tr1 = new int[3];

private int[] \_tr2 = new int[3];

public FormEnterParents();

private void buttonHelp\_Click(object sender, EventArgs e);

private void buttonCreateHeir\_Click(object sender, EventArgs e);

private void pictureBox2\_Paint(object sender, PaintEventArgs e);

private void pictureBox1\_Paint(object sender, PaintEventArgs e);

private void CheckKeyPress(object sender, KeyPressEventArgs e);

private void SetTrSide(object sender, EventArgs e);

private void SetPoints();

private void FormEnterParents\_Load(object sender, EventArgs e);

}

public partial class Tutorial : Form

{

public Tutorial();

private void button1\_Click(object sender, EventArgs e);

}

public partial class IGuessForm : Form

{

protected int \_numberAttempt;

protected int \_numberPrompts;

public IGuessForm();

protected virtual void buttonReply\_Click(object sender, EventArgs e);

protected virtual void buttonGetPrompted\_Click(object sender, EventArgs e);

}

public partial class GuessHeirForm : IGuessForm

{

private ITriangle \_trParent1;

private ITriangle \_trParent2;

private ITriangle \_trHeir;

private double[] \_1sidePrompts = new double[2];

private double[] \_2sidePrompts = new double[2];

private double[] \_anglePrompts = new double[2];

private string[] \_prompts = new string[3];

private float[] \_pTriangle = new float[3];

private readonly float[] \_pFirst = { 105, 105 };

private readonly Pen \_blackPen = new Pen(Color.Black, 2);

public GuessHeirForm();

public GuessHeirForm(ITriangle parent1, ITriangle parent2);

private void CheckAttempt(int[] userAttempt);

private string GetPrompts(ref double[] prompts, double rightAttempt);

private void GuessHeirForm\_Load(object sender, EventArgs e);

protected override void buttonReply\_Click(object sender, EventArgs e);

private void UpdateStatistics();

protected override void buttonGetPrompted\_Click(object sender, EventArgs e);

private void CheckKeyPress(object sender, KeyPressEventArgs e);

private void pictureTriangleHeir\_Paint(object sender, PaintEventArgs e);

}

# **4 ДИАГРАММА КЛАССОВ**

UML диаграмма классов изображена на рисунке 1.

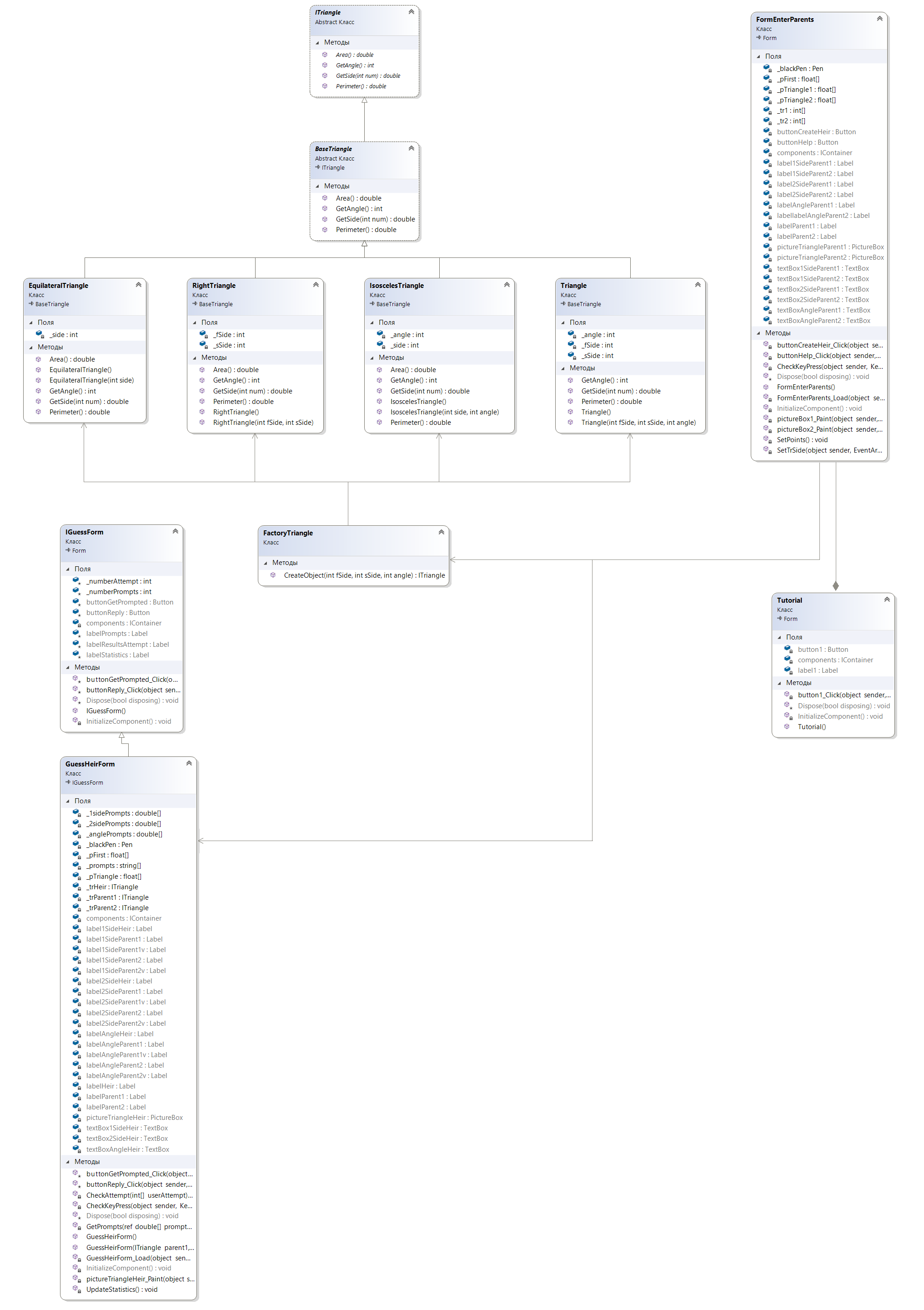


Рисунок 1 – Диаграмма классов

**ЛИСТИНГ ПРОГРАММЫ**

ITriangle.cs

using System;

using System.Collections.Generic;

using System.Text;

namespace OOP\_lab5\_6

{

public abstract class ITriangle

{

public abstract double Perimeter(); //периметр

public abstract double Area(); //площадь

public abstract double GetSide(int num); //получение стороны

public abstract int GetAngle(); //получение угла

}

}

TriangleBase.cs

using System;

using System.Collections.Generic;

using System.Text;

namespace OOP\_lab5\_6

{

public abstract class BaseTriangle : ITriangle

{

public override double Perimeter()

{

return GetSide(1) + GetSide(2) + GetSide(3);

}

public override double Area()

{

return GetSide(1) \* GetSide(2) \* Math.Sin(Math.PI \* GetAngle() / 180);

}

public override int GetAngle()

{

return GetAngle();

}

public override double GetSide(int num)

{

return GetSide(num);

}

}

}

RightTriangle.cs

using System;

using System.Collections.Generic;

using System.Text;

namespace OOP\_lab5\_6

{

public class RightTriangle : BaseTriangle

{

public override double Perimeter()

{

return base.Perimeter();

}

public override double Area()

{

return \_fSide \* \_sSide / 2;

}

public override double GetSide(int num)

{

switch (num)

{

case 1:

return \_fSide;

case 2:

return \_sSide;

case 3:

return Math.Sqrt(Math.Pow(Math.Max(\_fSide, \_sSide), 2) - Math.Pow(Math.Min(\_fSide, \_sSide), 2));

default:

throw new Exception("Неверный номер стороны");

}

}

public override int GetAngle()

{

return 90;

}

public RightTriangle()

{

\_fSide = 0;

\_sSide = 0;

}

public RightTriangle(int fSide, int sSide)

{

if (fSide <= 0 || sSide <= 0)

{

throw new Exception("Недопустимая длина стороны");

}

\_fSide = fSide;

\_sSide = sSide;

}

private int \_fSide; //первый катет

private int \_sSide; //второй катет

}

}

IsoscelesTriangle.cs

using System;

using System.Collections.Generic;

using System.Text;

namespace OOP\_lab5\_6

{

public class IsoscelesTriangle : BaseTriangle

{

public override double Perimeter()

{

return base.Perimeter();

}

public override double Area()

{

return base.Area();

}

public override double GetSide(int num)

{

switch (num)

{

case 1:

case 2:

return \_side;

case 3:

return \_side / (2 \* Math.Cos(Math.PI \* \_angle / 180));

default:

throw new Exception("Неверный номер стороны");

}

}

public override int GetAngle()

{

return \_angle;

}

public IsoscelesTriangle()

{

\_side = 0;

\_angle = 0;

}

public IsoscelesTriangle(int side, int angle)

{

if (side <= 0)

{

throw new Exception("Недопустимая длина стороны");

}

if (angle <= 0 || angle >= 180)

{

throw new Exception("Недопустимый угол");

}

\_side = side;

\_angle = angle;

}

private int \_side;

private int \_angle;

}

}

EquilateralTriangle.cs

using System;

using System.Collections.Generic;

using System.Text;

namespace OOP\_lab5\_6

{

public class EquilateralTriangle : BaseTriangle

{

public override double Perimeter()

{

return base.Perimeter();

}

public override double Area()

{

return \_side \* \_side \* Math.Sqrt(3) / 4;

}

public override double GetSide(int num)

{

switch (num)

{

case 1:

case 2:

case 3:

return \_side;

default:

throw new Exception("Неверный номер стороны");

}

}

public override int GetAngle()

{

return 60;

}

public EquilateralTriangle()

{

\_side = 0;

}

public EquilateralTriangle(int side)

{

if (side <= 0)

{

throw new Exception("Недопустимая длина стороны");

}

\_side = side;

}

private int \_side;

}

}

FactoryTriangle.cs

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace OOP\_lab5\_6

{

class FactoryTriangle

{

public static ITriangle CreateObject(int fSide, int sSide, int angle)

{

if (angle == 90)

{

return new RightTriangle(fSide, sSide);

}

if (fSide == sSide)

{

if (angle == 60)

{

return new EquilateralTriangle(fSide);

}

return new IsoscelesTriangle(fSide, angle);

}

return new Triangle(fSide, sSide, angle);

}

}

}

FormEnterParents.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 OOP\_lab5\_6

{

public partial class FormEnterParents : Form

{

private readonly float[] \_pFirst = { 105, 105 };

private float[] \_pTriangle1 = new float[3];

private float[] \_pTriangle2 = new float[3];

private readonly Pen \_blackPen = new Pen(Color.Black, 2);

private int[] \_tr1 = new int[3];

private int[] \_tr2 = new int[3];

public FormEnterParents()

{

InitializeComponent();

}

private void buttonHelp\_Click(object sender, EventArgs e)

{

Tutorial f = new Tutorial();

f.ShowDialog();

}

private void buttonCreateHeir\_Click(object sender, EventArgs e)

{

try

{

GuessHeirForm g = new GuessHeirForm(FactoryTriangle.CreateObject(\_tr1[0], \_tr1[1], \_tr1[2]), FactoryTriangle.CreateObject(\_tr2[0], \_tr2[1], \_tr2[2]));

//Hide();

//Application.Run(new GuessHeirForm(FactoryTriangle.CreateObject(\_tr1[0], \_tr1[1], \_tr1[2]), FactoryTriangle.CreateObject(\_tr2[0], \_tr2[1], \_tr2[2])));

g.ShowDialog();

}

catch(Exception err)

{

MessageBox.Show(err.Message, "Ошибка", MessageBoxButtons.OK, MessageBoxIcon.Error);

}

}

private void pictureBox2\_Paint(object sender, PaintEventArgs e)

{

e.Graphics.DrawLine(\_blackPen, \_pFirst[0], \_pFirst[1], \_pTriangle2[0], \_pFirst[1]);

e.Graphics.DrawLine(\_blackPen, \_pTriangle2[0], \_pFirst[1], \_pTriangle2[1], \_pTriangle2[2]);

e.Graphics.DrawLine(\_blackPen, \_pTriangle2[1], \_pTriangle2[2], \_pFirst[0], \_pFirst[1]);

}

private void pictureBox1\_Paint(object sender, PaintEventArgs e)

{

e.Graphics.DrawLine(\_blackPen, \_pFirst[0], \_pFirst[1], \_pTriangle1[0], \_pFirst[1]);

e.Graphics.DrawLine(\_blackPen, \_pTriangle1[0], \_pFirst[1], \_pTriangle1[1], \_pTriangle1[2]);

e.Graphics.DrawLine(\_blackPen, \_pTriangle1[1], \_pTriangle1[2], \_pFirst[0], \_pFirst[1]);

}

private void CheckKeyPress(object sender, KeyPressEventArgs e)

{

if (!Char.IsDigit(e.KeyChar) && e.KeyChar != Convert.ToChar(8))

{

e.Handled = true;

}

}

private void SetTrSide(object sender, EventArgs e)

{

TextBox text = sender as TextBox;

if (text.Text != "")

{

ref int side = ref \_tr1[0];

try

{

int val = Convert.ToInt32(text.Text);

switch ((string)text.Name)

{

case "textBox1SideParent1":

break;

case "textBox2SideParent1":

side = ref \_tr1[1];

break;

case "textBoxAngleParent1":

side = ref \_tr1[2];

if (val <= 0 || val >= 180)

throw new Exception("Угол должен быть больше 0 и меньше 180");

break;

case "textBox1SideParent2":

side = ref \_tr2[0];

break;

case "textBox2SideParent2":

side = ref \_tr2[1];

break;

case "textBoxAngleParent2":

side = ref \_tr2[2];

if (val <= 0 || val >= 180)

throw new Exception("Угол должен быть больше 0 и меньше 180");

break;

default:

throw new Exception("Объекта не существует");

}

side = val;

}

catch (System.FormatException)

{

MessageBox.Show("Некорректный ввод", "Внимание", MessageBoxButtons.OK, MessageBoxIcon.Warning);

text.Clear();

side = 0;

}

catch (Exception err)

{

MessageBox.Show(err.Message, "Ошибка", MessageBoxButtons.OK, MessageBoxIcon.Error);

text.Clear();

side = 0;

}

finally

{

SetPoints();

}

}

}

private void SetPoints()

{

float coef = Math.Max((float)\_tr1[0] / 100, (float)\_tr1[1] / 100);

\_pTriangle1[0] = (float)(\_pFirst[0] + \_tr1[0] / coef);

\_pTriangle1[1] = (float)(\_pFirst[0] + \_tr1[1] / coef \* Math.Cos(Math.PI \* \_tr1[2] / 180));

\_pTriangle1[2] = (float)(\_pFirst[1] - \_tr1[1] / coef \* Math.Sin(Math.PI \* \_tr1[2] / 180));

coef = Math.Max((float)\_tr2[0] / 100, (float)\_tr2[1] / 100);

\_pTriangle2[0] = (float)(\_pFirst[0] + \_tr2[0] / coef);

\_pTriangle2[1] = (float)(\_pFirst[0] + \_tr2[1] / coef \* Math.Cos(Math.PI \* \_tr2[2] / 180));

\_pTriangle2[2] = (float)(\_pFirst[1] - \_tr2[1] / coef \* Math.Sin(Math.PI \* \_tr2[2] / 180));

pictureTriangleParent1.Refresh();

pictureTriangleParent2.Refresh();

}

private void FormEnterParents\_Load(object sender, EventArgs e)

{

SetPoints();

}

}

}

FormEnterParents.Desigher.cs

partial class FormEnterParents

{

/// <summary>

/// Required designer variable.

/// </summary>

private System.ComponentModel.IContainer components = null;

/// <summary>

/// Clean up any resources being used.

/// </summary>

/// <param name="disposing">true if managed resources should be disposed; otherwise, false.</param>

protected override void Dispose(bool disposing)

{

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

{

components.Dispose();

}

base.Dispose(disposing);

}

#region Windows Form Designer generated code

/// <summary>

/// Required method for Designer support - do not modify

/// the contents of this method with the code editor.

/// </summary>

private void InitializeComponent()

{

System.ComponentModel.ComponentResourceManager resources = new System.ComponentModel.ComponentResourceManager(typeof(FormEnterParents));

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

this.textBox2SideParent2 = new System.Windows.Forms.TextBox();

this.textBox1SideParent2 = new System.Windows.Forms.TextBox();

this.labelParent1 = new System.Windows.Forms.Label();

this.labelParent2 = new System.Windows.Forms.Label();

this.textBoxAngleParent2 = new System.Windows.Forms.TextBox();

this.label1SideParent2 = new System.Windows.Forms.Label();

this.label2SideParent2 = new System.Windows.Forms.Label();

this.labellabelAngleParent2 = new System.Windows.Forms.Label();

this.labelAngleParent1 = new System.Windows.Forms.Label();

this.label2SideParent1 = new System.Windows.Forms.Label();

this.label1SideParent1 = new System.Windows.Forms.Label();

this.textBoxAngleParent1 = new System.Windows.Forms.TextBox();

this.textBox1SideParent1 = new System.Windows.Forms.TextBox();

this.textBox2SideParent1 = new System.Windows.Forms.TextBox();

this.pictureTriangleParent1 = new System.Windows.Forms.PictureBox();

this.pictureTriangleParent2 = new System.Windows.Forms.PictureBox();

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

((System.ComponentModel.ISupportInitialize)(this.pictureTriangleParent1)).BeginInit();

((System.ComponentModel.ISupportInitialize)(this.pictureTriangleParent2)).BeginInit();

this.SuspendLayout();

//

// buttonHelp

//

this.buttonHelp.Anchor = ((System.Windows.Forms.AnchorStyles)((System.Windows.Forms.AnchorStyles.Bottom | System.Windows.Forms.AnchorStyles.Left)));

this.buttonHelp.AutoSize = true;

this.buttonHelp.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.buttonHelp.Location = new System.Drawing.Point(12, 488);

this.buttonHelp.Name = "buttonHelp";

this.buttonHelp.Size = new System.Drawing.Size(203, 39);

this.buttonHelp.TabIndex = 0;

this.buttonHelp.Text = "Что мне делать?";

this.buttonHelp.UseVisualStyleBackColor = true;

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

//

// textBox2SideParent2

//

this.textBox2SideParent2.Anchor = System.Windows.Forms.AnchorStyles.Right;

this.textBox2SideParent2.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.textBox2SideParent2.Location = new System.Drawing.Point(698, 343);

this.textBox2SideParent2.Name = "textBox2SideParent2";

this.textBox2SideParent2.Size = new System.Drawing.Size(110, 24);

this.textBox2SideParent2.TabIndex = 1;

this.textBox2SideParent2.TextChanged += new System.EventHandler(this.SetTrSide);

this.textBox2SideParent2.KeyPress += new System.Windows.Forms.KeyPressEventHandler(this.CheckKeyPress);

//

// textBox1SideParent2

//

this.textBox1SideParent2.Anchor = System.Windows.Forms.AnchorStyles.Right;

this.textBox1SideParent2.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.textBox1SideParent2.Location = new System.Drawing.Point(698, 315);

this.textBox1SideParent2.Name = "textBox1SideParent2";

this.textBox1SideParent2.Size = new System.Drawing.Size(110, 24);

this.textBox1SideParent2.TabIndex = 2;

this.textBox1SideParent2.TextChanged += new System.EventHandler(this.SetTrSide);

this.textBox1SideParent2.KeyPress += new System.Windows.Forms.KeyPressEventHandler(this.CheckKeyPress);

//

// labelParent1

//

this.labelParent1.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.labelParent1.AutoSize = true;

this.labelParent1.Font = new System.Drawing.Font("Microsoft Sans Serif", 13.8F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.labelParent1.Location = new System.Drawing.Point(79, 81);

this.labelParent1.Name = "labelParent1";

this.labelParent1.Size = new System.Drawing.Size(145, 29);

this.labelParent1.TabIndex = 3;

this.labelParent1.Text = "Родитель 1";

//

// labelParent2

//

this.labelParent2.Anchor = System.Windows.Forms.AnchorStyles.Right;

this.labelParent2.AutoSize = true;

this.labelParent2.Font = new System.Drawing.Font("Microsoft Sans Serif", 13.8F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.labelParent2.Location = new System.Drawing.Point(593, 81);

this.labelParent2.Name = "labelParent2";

this.labelParent2.Size = new System.Drawing.Size(145, 29);

this.labelParent2.TabIndex = 4;

this.labelParent2.Text = "Родитель 2";

//

// textBoxAngleParent2

//

this.textBoxAngleParent2.Anchor = System.Windows.Forms.AnchorStyles.Right;

this.textBoxAngleParent2.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.textBoxAngleParent2.Location = new System.Drawing.Point(698, 375);

this.textBoxAngleParent2.Name = "textBoxAngleParent2";

this.textBoxAngleParent2.Size = new System.Drawing.Size(110, 24);

this.textBoxAngleParent2.TabIndex = 5;

this.textBoxAngleParent2.TextChanged += new System.EventHandler(this.SetTrSide);

this.textBoxAngleParent2.KeyPress += new System.Windows.Forms.KeyPressEventHandler(this.CheckKeyPress);

//

// label1SideParent2

//

this.label1SideParent2.Anchor = System.Windows.Forms.AnchorStyles.Right;

this.label1SideParent2.AutoSize = true;

this.label1SideParent2.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label1SideParent2.Location = new System.Drawing.Point(595, 315);

this.label1SideParent2.Name = "label1SideParent2";

this.label1SideParent2.Size = new System.Drawing.Size(90, 18);

this.label1SideParent2.TabIndex = 6;

this.label1SideParent2.Text = "1-я сторона";

//

// label2SideParent2

//

this.label2SideParent2.Anchor = System.Windows.Forms.AnchorStyles.Right;

this.label2SideParent2.AutoSize = true;

this.label2SideParent2.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label2SideParent2.Location = new System.Drawing.Point(595, 348);

this.label2SideParent2.Name = "label2SideParent2";

this.label2SideParent2.Size = new System.Drawing.Size(90, 18);

this.label2SideParent2.TabIndex = 7;

this.label2SideParent2.Text = "2-я сторона";

//

// labellabelAngleParent2

//

this.labellabelAngleParent2.Anchor = System.Windows.Forms.AnchorStyles.Right;

this.labellabelAngleParent2.AutoSize = true;

this.labellabelAngleParent2.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.labellabelAngleParent2.Location = new System.Drawing.Point(644, 380);

this.labellabelAngleParent2.Name = "labellabelAngleParent2";

this.labellabelAngleParent2.Size = new System.Drawing.Size(42, 18);

this.labellabelAngleParent2.TabIndex = 8;

this.labellabelAngleParent2.Text = "Угол";

//

// labelAngleParent1

//

this.labelAngleParent1.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.labelAngleParent1.AutoSize = true;

this.labelAngleParent1.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.labelAngleParent1.Location = new System.Drawing.Point(130, 380);

this.labelAngleParent1.Name = "labelAngleParent1";

this.labelAngleParent1.Size = new System.Drawing.Size(42, 18);

this.labelAngleParent1.TabIndex = 14;

this.labelAngleParent1.Text = "Угол";

//

// label2SideParent1

//

this.label2SideParent1.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.label2SideParent1.AutoSize = true;

this.label2SideParent1.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label2SideParent1.Location = new System.Drawing.Point(81, 348);

this.label2SideParent1.Name = "label2SideParent1";

this.label2SideParent1.Size = new System.Drawing.Size(90, 18);

this.label2SideParent1.TabIndex = 13;

this.label2SideParent1.Text = "2-я сторона";

//

// label1SideParent1

//

this.label1SideParent1.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.label1SideParent1.AutoSize = true;

this.label1SideParent1.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label1SideParent1.Location = new System.Drawing.Point(81, 315);

this.label1SideParent1.Name = "label1SideParent1";

this.label1SideParent1.Size = new System.Drawing.Size(90, 18);

this.label1SideParent1.TabIndex = 12;

this.label1SideParent1.Text = "1-я сторона";

//

// textBoxAngleParent1

//

this.textBoxAngleParent1.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.textBoxAngleParent1.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.textBoxAngleParent1.Location = new System.Drawing.Point(184, 375);

this.textBoxAngleParent1.Name = "textBoxAngleParent1";

this.textBoxAngleParent1.Size = new System.Drawing.Size(110, 24);

this.textBoxAngleParent1.TabIndex = 11;

this.textBoxAngleParent1.TextChanged += new System.EventHandler(this.SetTrSide);

this.textBoxAngleParent1.KeyPress += new System.Windows.Forms.KeyPressEventHandler(this.CheckKeyPress);

//

// textBox1SideParent1

//

this.textBox1SideParent1.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.textBox1SideParent1.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.textBox1SideParent1.Location = new System.Drawing.Point(184, 315);

this.textBox1SideParent1.Name = "textBox1SideParent1";

this.textBox1SideParent1.Size = new System.Drawing.Size(110, 24);

this.textBox1SideParent1.TabIndex = 10;

this.textBox1SideParent1.TextChanged += new System.EventHandler(this.SetTrSide);

this.textBox1SideParent1.KeyPress += new System.Windows.Forms.KeyPressEventHandler(this.CheckKeyPress);

//

// textBox2SideParent1

//

this.textBox2SideParent1.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.textBox2SideParent1.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.textBox2SideParent1.Location = new System.Drawing.Point(184, 343);

this.textBox2SideParent1.Name = "textBox2SideParent1";

this.textBox2SideParent1.Size = new System.Drawing.Size(110, 24);

this.textBox2SideParent1.TabIndex = 9;

this.textBox2SideParent1.TextChanged += new System.EventHandler(this.SetTrSide);

this.textBox2SideParent1.KeyPress += new System.Windows.Forms.KeyPressEventHandler(this.CheckKeyPress);

//

// pictureTriangleParent1

//

this.pictureTriangleParent1.Anchor = System.Windows.Forms.AnchorStyles.Right;

this.pictureTriangleParent1.BackColor = System.Drawing.SystemColors.ButtonHighlight;

this.pictureTriangleParent1.BorderStyle = System.Windows.Forms.BorderStyle.Fixed3D;

this.pictureTriangleParent1.Location = new System.Drawing.Point(84, 153);

this.pictureTriangleParent1.Name = "pictureTriangleParent1";

this.pictureTriangleParent1.Size = new System.Drawing.Size(210, 110);

this.pictureTriangleParent1.TabIndex = 15;

this.pictureTriangleParent1.TabStop = false;

this.pictureTriangleParent1.Paint += new System.Windows.Forms.PaintEventHandler(this.pictureBox1\_Paint);

//

// pictureTriangleParent2

//

this.pictureTriangleParent2.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.pictureTriangleParent2.BackColor = System.Drawing.SystemColors.ButtonHighlight;

this.pictureTriangleParent2.BorderStyle = System.Windows.Forms.BorderStyle.Fixed3D;

this.pictureTriangleParent2.Location = new System.Drawing.Point(598, 153);

this.pictureTriangleParent2.Name = "pictureTriangleParent2";

this.pictureTriangleParent2.Size = new System.Drawing.Size(210, 110);

this.pictureTriangleParent2.TabIndex = 16;

this.pictureTriangleParent2.TabStop = false;

this.pictureTriangleParent2.Paint += new System.Windows.Forms.PaintEventHandler(this.pictureBox2\_Paint);

//

// buttonCreateHeir

//

this.buttonCreateHeir.Anchor = ((System.Windows.Forms.AnchorStyles)((System.Windows.Forms.AnchorStyles.Bottom | System.Windows.Forms.AnchorStyles.Right)));

this.buttonCreateHeir.AutoSize = true;

this.buttonCreateHeir.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.buttonCreateHeir.Location = new System.Drawing.Point(671, 488);

this.buttonCreateHeir.Name = "buttonCreateHeir";

this.buttonCreateHeir.Size = new System.Drawing.Size(203, 39);

this.buttonCreateHeir.TabIndex = 17;

this.buttonCreateHeir.Text = "Угадать наследника";

this.buttonCreateHeir.UseVisualStyleBackColor = true;

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

//

// FormEnterParents

//

this.AutoScaleMode = System.Windows.Forms.AutoScaleMode.None;

this.ClientSize = new System.Drawing.Size(886, 539);

this.Controls.Add(this.pictureTriangleParent2);

this.Controls.Add(this.pictureTriangleParent1);

this.Controls.Add(this.buttonCreateHeir);

this.Controls.Add(this.labelAngleParent1);

this.Controls.Add(this.label2SideParent1);

this.Controls.Add(this.label1SideParent1);

this.Controls.Add(this.textBoxAngleParent1);

this.Controls.Add(this.textBox1SideParent1);

this.Controls.Add(this.textBox2SideParent1);

this.Controls.Add(this.labellabelAngleParent2);

this.Controls.Add(this.label2SideParent2);

this.Controls.Add(this.label1SideParent2);

this.Controls.Add(this.textBoxAngleParent2);

this.Controls.Add(this.labelParent2);

this.Controls.Add(this.labelParent1);

this.Controls.Add(this.textBox1SideParent2);

this.Controls.Add(this.textBox2SideParent2);

this.Controls.Add(this.buttonHelp);

this.FormBorderStyle = System.Windows.Forms.FormBorderStyle.FixedDialog;

this.Icon = ((System.Drawing.Icon)(resources.GetObject("$this.Icon")));

this.MaximizeBox = false;

this.MinimumSize = new System.Drawing.Size(598, 476);

this.Name = "FormEnterParents";

this.Text = "Ввод треугольников-родителей";

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

((System.ComponentModel.ISupportInitialize)(this.pictureTriangleParent1)).EndInit();

((System.ComponentModel.ISupportInitialize)(this.pictureTriangleParent2)).EndInit();

this.ResumeLayout(false);

this.PerformLayout();

}

#endregion

private System.Windows.Forms.Button buttonHelp;

private System.Windows.Forms.TextBox textBox2SideParent2;

private System.Windows.Forms.TextBox textBox1SideParent2;

private System.Windows.Forms.Label labelParent1;

private System.Windows.Forms.Label labelParent2;

private System.Windows.Forms.TextBox textBoxAngleParent2;

private System.Windows.Forms.Label label1SideParent2;

private System.Windows.Forms.Label label2SideParent2;

private System.Windows.Forms.Label labellabelAngleParent2;

private System.Windows.Forms.Label labelAngleParent1;

private System.Windows.Forms.Label label2SideParent1;

private System.Windows.Forms.Label label1SideParent1;

private System.Windows.Forms.TextBox textBoxAngleParent1;

private System.Windows.Forms.TextBox textBox1SideParent1;

private System.Windows.Forms.TextBox textBox2SideParent1;

private System.Windows.Forms.PictureBox pictureTriangleParent1;

private System.Windows.Forms.PictureBox pictureTriangleParent2;

private System.Windows.Forms.Button buttonCreateHeir;

}

Tutorial.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 OOP\_lab5\_6

{

public partial class Tutorial : Form

{

public Tutorial()

{

InitializeComponent();

label1.Text = "Вам необходимо ввести два треугольника. На их основе будет построен треугольник-наследник, который вам необходимо угадать. Чтобы получить ответ, делайте попытки и используйте подсказки. Удачи!";

}

private void button1\_Click(object sender, EventArgs e)

{

this.Close();

}

}

}

Tutorial.Desigher.cs

namespace OOP\_lab5\_6

{

partial class Tutorial

{

/// <summary>

/// Required designer variable.

/// </summary>

private System.ComponentModel.IContainer components = null;

/// <summary>

/// Clean up any resources being used.

/// </summary>

/// <param name="disposing">true if managed resources should be disposed; otherwise, false.</param>

protected override void Dispose(bool disposing)

{

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

{

components.Dispose();

}

base.Dispose(disposing);

}

#region Windows Form Designer generated code

/// <summary>

/// Required method for Designer support - do not modify

/// the contents of this method with the code editor.

/// </summary>

private void InitializeComponent()

{

System.ComponentModel.ComponentResourceManager resources = new System.ComponentModel.ComponentResourceManager(typeof(Tutorial));

this.label1 = new System.Windows.Forms.Label();

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

this.SuspendLayout();

//

// label1

//

this.label1.Anchor = ((System.Windows.Forms.AnchorStyles)((((System.Windows.Forms.AnchorStyles.Top | System.Windows.Forms.AnchorStyles.Bottom)

| System.Windows.Forms.AnchorStyles.Left)

| System.Windows.Forms.AnchorStyles.Right)));

this.label1.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label1.Location = new System.Drawing.Point(12, 9);

this.label1.Name = "label1";

this.label1.Size = new System.Drawing.Size(414, 103);

this.label1.TabIndex = 0;

//

// button1

//

this.button1.Anchor = ((System.Windows.Forms.AnchorStyles)((System.Windows.Forms.AnchorStyles.Bottom | System.Windows.Forms.AnchorStyles.Right)));

this.button1.Location = new System.Drawing.Point(288, 115);

this.button1.Name = "button1";

this.button1.Size = new System.Drawing.Size(136, 32);

this.button1.TabIndex = 1;

this.button1.Text = "Ок!";

this.button1.UseVisualStyleBackColor = true;

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

//

// Tutorial

//

this.AutoScaleDimensions = new System.Drawing.SizeF(8F, 16F);

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

this.ClientSize = new System.Drawing.Size(434, 159);

this.Controls.Add(this.button1);

this.Controls.Add(this.label1);

this.FormBorderStyle = System.Windows.Forms.FormBorderStyle.FixedDialog;

this.Icon = ((System.Drawing.Icon)(resources.GetObject("$this.Icon")));

this.MaximizeBox = false;

this.MinimizeBox = false;

this.Name = "Tutorial";

this.Text = "Что мне делать?";

this.ResumeLayout(false);

}

#endregion

private System.Windows.Forms.Label label1;

private System.Windows.Forms.Button button1;

}

}

IGuessForm.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 OOP\_lab5\_6

{

public partial class IGuessForm : Form

{

protected int \_numberAttempt;

protected int \_numberPrompts;

public IGuessForm()

{

InitializeComponent();

}

protected virtual void buttonReply\_Click(object sender, EventArgs e)

{

}

protected virtual void buttonGetPrompted\_Click(object sender, EventArgs e)

{

}

}

}

IGuessForm.Desigher.cs

namespace OOP\_lab5\_6

{

public partial class IGuessForm

{

/// <summary>

/// Required designer variable.

/// </summary>

private System.ComponentModel.IContainer components = null;

/// <summary>

/// Clean up any resources being used.

/// </summary>

/// <param name="disposing">true if managed resources should be disposed; otherwise, false.</param>

protected override void Dispose(bool disposing)

{

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

{

components.Dispose();

}

base.Dispose(disposing);

}

#region Windows Form Designer generated code

/// <summary>

/// Required method for Designer support - do not modify

/// the contents of this method with the code editor.

/// </summary>

private void InitializeComponent()

{

this.labelStatistics = new System.Windows.Forms.Label();

this.labelPrompts = new System.Windows.Forms.Label();

this.labelResultsAttempt = new System.Windows.Forms.Label();

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

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

this.SuspendLayout();

//

// labelStatistics

//

this.labelStatistics.Location = new System.Drawing.Point(218, 62);

this.labelStatistics.Name = "labelStatistics";

this.labelStatistics.Size = new System.Drawing.Size(444, 78);

this.labelStatistics.TabIndex = 10;

this.labelStatistics.Text = "Статистика";

this.labelStatistics.TextAlign = System.Drawing.ContentAlignment.MiddleCenter;

//

// labelPrompts

//

this.labelPrompts.Anchor = System.Windows.Forms.AnchorStyles.Bottom;

this.labelPrompts.BackColor = System.Drawing.SystemColors.ButtonHighlight;

this.labelPrompts.BorderStyle = System.Windows.Forms.BorderStyle.FixedSingle;

this.labelPrompts.Location = new System.Drawing.Point(221, 394);

this.labelPrompts.Name = "labelPrompts";

this.labelPrompts.Size = new System.Drawing.Size(444, 106);

this.labelPrompts.TabIndex = 9;

this.labelPrompts.Text = "Подсказки";

this.labelPrompts.TextAlign = System.Drawing.ContentAlignment.MiddleCenter;

//

// labelResultsAttempt

//

this.labelResultsAttempt.Location = new System.Drawing.Point(218, 234);

this.labelResultsAttempt.Name = "labelResultsAttempt";

this.labelResultsAttempt.Size = new System.Drawing.Size(447, 78);

this.labelResultsAttempt.TabIndex = 8;

this.labelResultsAttempt.Text = "Результаты попытки";

this.labelResultsAttempt.TextAlign = System.Drawing.ContentAlignment.MiddleCenter;

//

// buttonReply

//

this.buttonReply.Anchor = System.Windows.Forms.AnchorStyles.Bottom;

this.buttonReply.Location = new System.Drawing.Point(671, 461);

this.buttonReply.Name = "buttonReply";

this.buttonReply.Size = new System.Drawing.Size(203, 39);

this.buttonReply.TabIndex = 7;

this.buttonReply.Text = "Дать ответ";

this.buttonReply.UseVisualStyleBackColor = true;

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

//

// buttonGetPrompted

//

this.buttonGetPrompted.Anchor = System.Windows.Forms.AnchorStyles.Bottom;

this.buttonGetPrompted.Location = new System.Drawing.Point(12, 461);

this.buttonGetPrompted.Name = "buttonGetPrompted";

this.buttonGetPrompted.Size = new System.Drawing.Size(203, 39);

this.buttonGetPrompted.TabIndex = 6;

this.buttonGetPrompted.Text = "Получить подсказку";

this.buttonGetPrompted.UseVisualStyleBackColor = true;

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

//

// IGuessForm

//

this.AutoScaleDimensions = new System.Drawing.SizeF(8F, 16F);

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

this.ClientSize = new System.Drawing.Size(886, 509);

this.Controls.Add(this.labelStatistics);

this.Controls.Add(this.labelPrompts);

this.Controls.Add(this.labelResultsAttempt);

this.Controls.Add(this.buttonReply);

this.Controls.Add(this.buttonGetPrompted);

this.FormBorderStyle = System.Windows.Forms.FormBorderStyle.FixedDialog;

this.MaximizeBox = false;

this.Name = "IGuessForm";

this.Text = "IForm";

this.ResumeLayout(false);

}

#endregion

protected System.Windows.Forms.Label labelStatistics;

protected System.Windows.Forms.Label labelPrompts;

protected System.Windows.Forms.Label labelResultsAttempt;

protected System.Windows.Forms.Button buttonReply;

protected System.Windows.Forms.Button buttonGetPrompted;

}

}

IGuessForm.cs

using System;

using System.Collections.Generic;

using System.ComponentModel;

using System.Data;

using System.Drawing;

using System.Text;

using System.Windows.Forms;

namespace OOP\_lab5\_6

{

public partial class GuessHeirForm : IGuessForm

{

private ITriangle \_trParent1;

private ITriangle \_trParent2;

private ITriangle \_trHeir;

private double[] \_1sidePrompts = new double[2];

private double[] \_2sidePrompts = new double[2];

private double[] \_anglePrompts = new double[2];

private string[] \_prompts = new string[3];

private float[] \_pTriangle = new float[3];

private readonly float[] \_pFirst = { 105, 105 };

private readonly Pen \_blackPen = new Pen(Color.Black, 2);

public GuessHeirForm()

{

InitializeComponent();

}

public GuessHeirForm(ITriangle parent1, ITriangle parent2)

{

\_trParent1 = parent1;

\_trParent2 = parent2;

\_1sidePrompts[0] = Math.Min(\_trParent1.GetSide(1), \_trParent2.GetSide(1));

\_1sidePrompts[1] = Math.Max(\_trParent1.GetSide(1), \_trParent2.GetSide(1));

\_2sidePrompts[0] = Math.Min(\_trParent1.GetSide(2), \_trParent2.GetSide(2));

\_2sidePrompts[1] = Math.Max(\_trParent1.GetSide(2), \_trParent2.GetSide(2));

\_anglePrompts[0] = Math.Min(\_trParent1.GetAngle(), \_trParent2.GetAngle());

\_anglePrompts[1] = Math.Max(\_trParent1.GetAngle(), \_trParent2.GetAngle());

Random ran = new Random();

int side1 = ran.Next((int)\_1sidePrompts[0], (int)\_1sidePrompts[1]);

int side2 = ran.Next((int)\_2sidePrompts[0], (int)\_2sidePrompts[1]);

int angle = ran.Next((int)\_anglePrompts[0], (int)\_anglePrompts[1]);

\_trHeir = FactoryTriangle.CreateObject(side1, side2, angle);

InitializeComponent();

\_pTriangle[0] = \_pFirst[0];

\_pTriangle[1] = \_pFirst[0];

\_pTriangle[2] = \_pFirst[1];

}

private void CheckAttempt(int[] userAttempt)

{

if (userAttempt[0] == \_trHeir.GetSide(1) && userAttempt[1] == \_trHeir.GetSide(2) && userAttempt[2] == \_trHeir.GetAngle())

{

string info = "Количество использованных подсказок: " + \_numberPrompts.ToString() + "\nКоличество попыток: " + \_numberAttempt.ToString();

MessageBox.Show(info, "Вы угадали", MessageBoxButtons.OK, MessageBoxIcon.Information);

Close();

return;

}

string[] attempt = new string[3];

if (userAttempt[0] > \_trHeir.GetSide(1))

attempt[0] = "< " + userAttempt[0].ToString() + '\n';

else if (userAttempt[0] < \_trHeir.GetSide(1))

attempt[0] = "> " + userAttempt[0].ToString() + '\n';

else attempt[0] = "верна\n";

if (userAttempt[1] > \_trHeir.GetSide(2))

attempt[1] = "< " + userAttempt[1].ToString() + '\n';

else if (userAttempt[1] < \_trHeir.GetSide(2))

attempt[1] = "> " + userAttempt[1].ToString() + '\n';

else attempt[1] = "верна\n";

if (userAttempt[2] > \_trHeir.GetAngle())

attempt[2] = "< " + userAttempt[2].ToString() + '\n';

else if (userAttempt[2] < \_trHeir.GetAngle())

attempt[2] = "> " + userAttempt[2].ToString() + '\n';

else attempt[2] = "верен\n";

labelResultsAttempt.Text = "1-я сторона " + attempt[0] + "2-сторона " + attempt[1] + "Угол " + attempt[2];

return;

}

private string GetPrompts(ref double[] prompts, double rightAttempt)

{

double med = (prompts[1] + prompts[0]) / 2;

if (med >= rightAttempt)

{

prompts[1] = med;

return "<= " + med.ToString();

}

else

{

prompts[0] = med;

return ">= " + med.ToString();

}

}

private void GuessHeirForm\_Load(object sender, EventArgs e)

{

\_numberAttempt = 0;

\_numberPrompts = 0;

label1SideParent1v.Text = \_trParent1.GetSide(1).ToString();

label2SideParent1v.Text = \_trParent1.GetSide(2).ToString();

labelAngleParent1v.Text = \_trParent1.GetAngle().ToString();

label1SideParent2v.Text = \_trParent2.GetSide(1).ToString();

label2SideParent2v.Text = \_trParent2.GetSide(2).ToString();

labelAngleParent2v.Text = \_trParent2.GetAngle().ToString();

//label1SideHeir.Text = \_trHeir.GetSide(1).ToString();

//label2SideHeir.Text = \_trHeir.GetSide(2).ToString();

//labelAngleHeir.Text = \_trHeir.GetAngle().ToString();

UpdateStatistics();

}

protected override void buttonReply\_Click(object sender, EventArgs e)

{

int[] att = new int[3];

try

{

att[0] = Convert.ToInt32(textBox1SideHeir.Text);

att[1] = Convert.ToInt32(textBox2SideHeir.Text);

att[2] = Convert.ToInt32(textBoxAngleHeir.Text);

\_numberAttempt++;

CheckAttempt(att);

float coef = Math.Max((float)att[0] / 100, (float)att[1] / 100);

\_pTriangle[0] = (float)(\_pFirst[0] + att[0] / coef);

\_pTriangle[1] = (float)(\_pFirst[0] + att[1] / coef \* Math.Cos(Math.PI \* att[2] / 180));

\_pTriangle[2] = (float)(\_pFirst[1] - att[1] / coef \* Math.Sin(Math.PI \* att[2] / 180));

pictureTriangleHeir.Refresh();

UpdateStatistics();

}

catch (System.FormatException)

{

MessageBox.Show("Введите все значения", "Внимание", MessageBoxButtons.OK, MessageBoxIcon.Warning);

}

}

private void UpdateStatistics()

{

labelStatistics.Text = "Количество попыток: " + \_numberAttempt.ToString() + "\nКоличество использованных подсказок: " + \_numberPrompts.ToString();

}

protected override void buttonGetPrompted\_Click(object sender, EventArgs e)

{

switch (\_numberPrompts % 3)

{

case 0:

\_prompts[0] = "1-я сторона " + GetPrompts(ref \_1sidePrompts, \_trHeir.GetSide(1));

break;

case 1:

\_prompts[1] = "\n2-я сторона " + GetPrompts(ref \_2sidePrompts, \_trHeir.GetSide(2));

break;

case 2:

\_prompts[2] = "\nУгол " + GetPrompts(ref \_anglePrompts, \_trHeir.GetAngle());

break;

}

labelPrompts.Text = \_prompts[0] + \_prompts[1] + \_prompts[2];

\_numberPrompts++;

UpdateStatistics();

}

private void CheckKeyPress(object sender, KeyPressEventArgs e)

{

if (!Char.IsDigit(e.KeyChar) && e.KeyChar != Convert.ToChar(8))

{

e.Handled = true;

}

}

private void pictureTriangleHeir\_Paint(object sender, PaintEventArgs e)

{

e.Graphics.DrawLine(\_blackPen, \_pFirst[0], \_pFirst[1], \_pTriangle[0], \_pFirst[1]);

e.Graphics.DrawLine(\_blackPen, \_pTriangle[0], \_pFirst[1], \_pTriangle[1], \_pTriangle[2]);

e.Graphics.DrawLine(\_blackPen, \_pTriangle[1], \_pTriangle[2], \_pFirst[0], \_pFirst[1]);

}

}

}

IGuessForm.Desigher.cs

namespace OOP\_lab5\_6

{

partial class GuessHeirForm : IGuessForm

{

/// <summary>

/// Обязательная 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>

/// Требуемый метод для поддержки конструктора — не изменяйте

/// содержимое этого метода с помощью редактора кода.

/// </summary>

private void InitializeComponent()

{

System.ComponentModel.ComponentResourceManager resources = new System.ComponentModel.ComponentResourceManager(typeof(GuessHeirForm));

this.labelParent1 = new System.Windows.Forms.Label();

this.labelAngleParent1 = new System.Windows.Forms.Label();

this.label2SideParent1 = new System.Windows.Forms.Label();

this.label1SideParent1 = new System.Windows.Forms.Label();

this.label1SideParent1v = new System.Windows.Forms.Label();

this.label2SideParent1v = new System.Windows.Forms.Label();

this.labelAngleParent1v = new System.Windows.Forms.Label();

this.labelParent2 = new System.Windows.Forms.Label();

this.labelAngleParent2v = new System.Windows.Forms.Label();

this.label2SideParent2v = new System.Windows.Forms.Label();

this.label1SideParent2v = new System.Windows.Forms.Label();

this.labelAngleParent2 = new System.Windows.Forms.Label();

this.label2SideParent2 = new System.Windows.Forms.Label();

this.label1SideParent2 = new System.Windows.Forms.Label();

this.labelAngleHeir = new System.Windows.Forms.Label();

this.label2SideHeir = new System.Windows.Forms.Label();

this.label1SideHeir = new System.Windows.Forms.Label();

this.pictureTriangleHeir = new System.Windows.Forms.PictureBox();

this.labelHeir = new System.Windows.Forms.Label();

this.textBox1SideHeir = new System.Windows.Forms.TextBox();

this.textBox2SideHeir = new System.Windows.Forms.TextBox();

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

((System.ComponentModel.ISupportInitialize)(this.pictureTriangleHeir)).BeginInit();

this.SuspendLayout();

//

// labelStatistics

//

this.labelStatistics.Location = new System.Drawing.Point(221, 75);

//

// labelPrompts

//

this.labelPrompts.Location = new System.Drawing.Point(221, 488);

//

// labelResultsAttempt

//

this.labelResultsAttempt.Location = new System.Drawing.Point(221, 284);

this.labelResultsAttempt.Size = new System.Drawing.Size(444, 78);

//

// buttonReply

//

this.buttonReply.Location = new System.Drawing.Point(671, 552);

//

// buttonGetPrompted

//

this.buttonGetPrompted.Location = new System.Drawing.Point(12, 552);

//this.buttonGetPrompted.Click += new System.EventHandler(this.buttonGetPrompted\_Click\_1);

//

// labelParent1

//

this.labelParent1.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.labelParent1.AutoSize = true;

this.labelParent1.Font = new System.Drawing.Font("Microsoft Sans Serif", 13.8F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.labelParent1.Location = new System.Drawing.Point(12, 41);

this.labelParent1.Name = "labelParent1";

this.labelParent1.Size = new System.Drawing.Size(145, 29);

this.labelParent1.TabIndex = 16;

this.labelParent1.Text = "Родитель 1";

//

// labelAngleParent1

//

this.labelAngleParent1.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.labelAngleParent1.AutoSize = true;

this.labelAngleParent1.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.labelAngleParent1.Location = new System.Drawing.Point(16, 147);

this.labelAngleParent1.Name = "labelAngleParent1";

this.labelAngleParent1.Size = new System.Drawing.Size(42, 18);

this.labelAngleParent1.TabIndex = 20;

this.labelAngleParent1.Text = "Угол";

//

// label2SideParent1

//

this.label2SideParent1.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.label2SideParent1.AutoSize = true;

this.label2SideParent1.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label2SideParent1.Location = new System.Drawing.Point(16, 114);

this.label2SideParent1.Name = "label2SideParent1";

this.label2SideParent1.Size = new System.Drawing.Size(90, 18);

this.label2SideParent1.TabIndex = 19;

this.label2SideParent1.Text = "2-я сторона";

//

// label1SideParent1

//

this.label1SideParent1.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.label1SideParent1.AutoSize = true;

this.label1SideParent1.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label1SideParent1.Location = new System.Drawing.Point(14, 84);

this.label1SideParent1.Name = "label1SideParent1";

this.label1SideParent1.Size = new System.Drawing.Size(90, 18);

this.label1SideParent1.TabIndex = 18;

this.label1SideParent1.Text = "1-я сторона";

//

// label1SideParent1v

//

this.label1SideParent1v.BackColor = System.Drawing.SystemColors.ButtonHighlight;

this.label1SideParent1v.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label1SideParent1v.Location = new System.Drawing.Point(111, 84);

this.label1SideParent1v.Name = "label1SideParent1v";

this.label1SideParent1v.Size = new System.Drawing.Size(106, 24);

this.label1SideParent1v.TabIndex = 21;

this.label1SideParent1v.Text = "0";

this.label1SideParent1v.TextAlign = System.Drawing.ContentAlignment.MiddleRight;

//

// label2SideParent1v

//

this.label2SideParent1v.BackColor = System.Drawing.SystemColors.ButtonHighlight;

this.label2SideParent1v.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label2SideParent1v.Location = new System.Drawing.Point(111, 114);

this.label2SideParent1v.Name = "label2SideParent1v";

this.label2SideParent1v.Size = new System.Drawing.Size(106, 24);

this.label2SideParent1v.TabIndex = 22;

this.label2SideParent1v.Text = "0";

this.label2SideParent1v.TextAlign = System.Drawing.ContentAlignment.MiddleRight;

//

// labelAngleParent1v

//

this.labelAngleParent1v.BackColor = System.Drawing.SystemColors.ButtonHighlight;

this.labelAngleParent1v.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.labelAngleParent1v.Location = new System.Drawing.Point(111, 144);

this.labelAngleParent1v.Name = "labelAngleParent1v";

this.labelAngleParent1v.Size = new System.Drawing.Size(106, 24);

this.labelAngleParent1v.TabIndex = 23;

this.labelAngleParent1v.Text = "0";

this.labelAngleParent1v.TextAlign = System.Drawing.ContentAlignment.MiddleRight;

//

// labelParent2

//

this.labelParent2.Anchor = System.Windows.Forms.AnchorStyles.Right;

this.labelParent2.AutoSize = true;

this.labelParent2.Font = new System.Drawing.Font("Microsoft Sans Serif", 13.8F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.labelParent2.Location = new System.Drawing.Point(7, 284);

this.labelParent2.Name = "labelParent2";

this.labelParent2.Size = new System.Drawing.Size(145, 29);

this.labelParent2.TabIndex = 24;

this.labelParent2.Text = "Родитель 2";

//

// labelAngleParent2v

//

this.labelAngleParent2v.BackColor = System.Drawing.SystemColors.ButtonHighlight;

this.labelAngleParent2v.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.labelAngleParent2v.Location = new System.Drawing.Point(105, 386);

this.labelAngleParent2v.Name = "labelAngleParent2v";

this.labelAngleParent2v.Size = new System.Drawing.Size(106, 24);

this.labelAngleParent2v.TabIndex = 31;

this.labelAngleParent2v.Text = "0";

this.labelAngleParent2v.TextAlign = System.Drawing.ContentAlignment.MiddleRight;

//

// label2SideParent2v

//

this.label2SideParent2v.BackColor = System.Drawing.SystemColors.ButtonHighlight;

this.label2SideParent2v.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label2SideParent2v.Location = new System.Drawing.Point(105, 356);

this.label2SideParent2v.Name = "label2SideParent2v";

this.label2SideParent2v.Size = new System.Drawing.Size(106, 24);

this.label2SideParent2v.TabIndex = 30;

this.label2SideParent2v.Text = "0";

this.label2SideParent2v.TextAlign = System.Drawing.ContentAlignment.MiddleRight;

//

// label1SideParent2v

//

this.label1SideParent2v.BackColor = System.Drawing.SystemColors.ButtonHighlight;

this.label1SideParent2v.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label1SideParent2v.Location = new System.Drawing.Point(105, 326);

this.label1SideParent2v.Name = "label1SideParent2v";

this.label1SideParent2v.Size = new System.Drawing.Size(106, 24);

this.label1SideParent2v.TabIndex = 29;

this.label1SideParent2v.Text = "0";

this.label1SideParent2v.TextAlign = System.Drawing.ContentAlignment.MiddleRight;

//

// labelAngleParent2

//

this.labelAngleParent2.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.labelAngleParent2.AutoSize = true;

this.labelAngleParent2.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.labelAngleParent2.Location = new System.Drawing.Point(11, 389);

this.labelAngleParent2.Name = "labelAngleParent2";

this.labelAngleParent2.Size = new System.Drawing.Size(42, 18);

this.labelAngleParent2.TabIndex = 28;

this.labelAngleParent2.Text = "Угол";

//

// label2SideParent2

//

this.label2SideParent2.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.label2SideParent2.AutoSize = true;

this.label2SideParent2.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label2SideParent2.Location = new System.Drawing.Point(11, 356);

this.label2SideParent2.Name = "label2SideParent2";

this.label2SideParent2.Size = new System.Drawing.Size(90, 18);

this.label2SideParent2.TabIndex = 27;

this.label2SideParent2.Text = "2-я сторона";

//

// label1SideParent2

//

this.label1SideParent2.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.label1SideParent2.AutoSize = true;

this.label1SideParent2.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label1SideParent2.Location = new System.Drawing.Point(9, 326);

this.label1SideParent2.Name = "label1SideParent2";

this.label1SideParent2.Size = new System.Drawing.Size(90, 18);

this.label1SideParent2.TabIndex = 26;

this.label1SideParent2.Text = "1-я сторона";

//

// labelAngleHeir

//

this.labelAngleHeir.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.labelAngleHeir.AutoSize = true;

this.labelAngleHeir.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.labelAngleHeir.Location = new System.Drawing.Point(668, 463);

this.labelAngleHeir.Name = "labelAngleHeir";

this.labelAngleHeir.Size = new System.Drawing.Size(42, 18);

this.labelAngleHeir.TabIndex = 36;

this.labelAngleHeir.Text = "Угол";

//

// label2SideHeir

//

this.label2SideHeir.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.label2SideHeir.AutoSize = true;

this.label2SideHeir.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label2SideHeir.Location = new System.Drawing.Point(668, 435);

this.label2SideHeir.Name = "label2SideHeir";

this.label2SideHeir.Size = new System.Drawing.Size(90, 18);

this.label2SideHeir.TabIndex = 35;

this.label2SideHeir.Text = "2-я сторона";

//

// label1SideHeir

//

this.label1SideHeir.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.label1SideHeir.AutoSize = true;

this.label1SideHeir.Font = new System.Drawing.Font("Microsoft Sans Serif", 9F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label1SideHeir.Location = new System.Drawing.Point(668, 407);

this.label1SideHeir.Name = "label1SideHeir";

this.label1SideHeir.Size = new System.Drawing.Size(90, 18);

this.label1SideHeir.TabIndex = 34;

this.label1SideHeir.Text = "1-я сторона";

//

// pictureTriangleHeir

//

this.pictureTriangleHeir.Anchor = System.Windows.Forms.AnchorStyles.Right;

this.pictureTriangleHeir.BackColor = System.Drawing.SystemColors.ButtonHighlight;

this.pictureTriangleHeir.BorderStyle = System.Windows.Forms.BorderStyle.Fixed3D;

this.pictureTriangleHeir.Location = new System.Drawing.Point(666, 73);

this.pictureTriangleHeir.Name = "pictureTriangleHeir";

this.pictureTriangleHeir.Size = new System.Drawing.Size(210, 110);

this.pictureTriangleHeir.TabIndex = 33;

this.pictureTriangleHeir.TabStop = false;

this.pictureTriangleHeir.Paint += new System.Windows.Forms.PaintEventHandler(this.pictureTriangleHeir\_Paint);

//

// labelHeir

//

this.labelHeir.Anchor = System.Windows.Forms.AnchorStyles.Left;

this.labelHeir.AutoSize = true;

this.labelHeir.Font = new System.Drawing.Font("Microsoft Sans Serif", 13.8F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.labelHeir.Location = new System.Drawing.Point(666, 41);

this.labelHeir.Name = "labelHeir";

this.labelHeir.Size = new System.Drawing.Size(140, 29);

this.labelHeir.TabIndex = 32;

this.labelHeir.Text = "Наследник";

//

// textBox1SideHeir

//

this.textBox1SideHeir.Location = new System.Drawing.Point(764, 404);

this.textBox1SideHeir.Name = "textBox1SideHeir";

this.textBox1SideHeir.Size = new System.Drawing.Size(109, 22);

this.textBox1SideHeir.TabIndex = 37;

this.textBox1SideHeir.KeyPress += new System.Windows.Forms.KeyPressEventHandler(this.CheckKeyPress);

//

// textBox2SideHeir

//

this.textBox2SideHeir.Location = new System.Drawing.Point(764, 431);

this.textBox2SideHeir.Name = "textBox2SideHeir";

this.textBox2SideHeir.Size = new System.Drawing.Size(109, 22);

this.textBox2SideHeir.TabIndex = 38;

this.textBox2SideHeir.KeyPress += new System.Windows.Forms.KeyPressEventHandler(this.CheckKeyPress);

//

// textBoxAngleHeir

//

this.textBoxAngleHeir.Location = new System.Drawing.Point(764, 459);

this.textBoxAngleHeir.Name = "textBoxAngleHeir";

this.textBoxAngleHeir.Size = new System.Drawing.Size(109, 22);

this.textBoxAngleHeir.TabIndex = 39;

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

//

// GuessHeirForm

//

this.AutoScaleDimensions = new System.Drawing.SizeF(8F, 16F);

this.ClientSize = new System.Drawing.Size(886, 603);

this.Controls.Add(this.textBoxAngleHeir);

this.Controls.Add(this.textBox2SideHeir);

this.Controls.Add(this.textBox1SideHeir);

this.Controls.Add(this.labelAngleHeir);

this.Controls.Add(this.label2SideHeir);

this.Controls.Add(this.label1SideHeir);

this.Controls.Add(this.pictureTriangleHeir);

this.Controls.Add(this.labelHeir);

this.Controls.Add(this.labelAngleParent2v);

this.Controls.Add(this.label2SideParent2v);

this.Controls.Add(this.label1SideParent2v);

this.Controls.Add(this.labelAngleParent2);

this.Controls.Add(this.label2SideParent2);

this.Controls.Add(this.label1SideParent2);

this.Controls.Add(this.labelParent2);

this.Controls.Add(this.labelAngleParent1v);

this.Controls.Add(this.label2SideParent1v);

this.Controls.Add(this.label1SideParent1v);

this.Controls.Add(this.labelAngleParent1);

this.Controls.Add(this.label2SideParent1);

this.Controls.Add(this.label1SideParent1);

this.Controls.Add(this.labelParent1);

this.Icon = ((System.Drawing.Icon)(resources.GetObject("$this.Icon")));

this.Name = "GuessHeirForm";

this.Text = "Угадай наследника";

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

this.Controls.SetChildIndex(this.labelPrompts, 0);

this.Controls.SetChildIndex(this.buttonGetPrompted, 0);

this.Controls.SetChildIndex(this.buttonReply, 0);

this.Controls.SetChildIndex(this.labelResultsAttempt, 0);

this.Controls.SetChildIndex(this.labelStatistics, 0);

this.Controls.SetChildIndex(this.labelParent1, 0);

this.Controls.SetChildIndex(this.label1SideParent1, 0);

this.Controls.SetChildIndex(this.label2SideParent1, 0);

this.Controls.SetChildIndex(this.labelAngleParent1, 0);

this.Controls.SetChildIndex(this.label1SideParent1v, 0);

this.Controls.SetChildIndex(this.label2SideParent1v, 0);

this.Controls.SetChildIndex(this.labelAngleParent1v, 0);

this.Controls.SetChildIndex(this.labelParent2, 0);

this.Controls.SetChildIndex(this.label1SideParent2, 0);

this.Controls.SetChildIndex(this.label2SideParent2, 0);

this.Controls.SetChildIndex(this.labelAngleParent2, 0);

this.Controls.SetChildIndex(this.label1SideParent2v, 0);

this.Controls.SetChildIndex(this.label2SideParent2v, 0);

this.Controls.SetChildIndex(this.labelAngleParent2v, 0);

this.Controls.SetChildIndex(this.labelHeir, 0);

this.Controls.SetChildIndex(this.pictureTriangleHeir, 0);

this.Controls.SetChildIndex(this.label1SideHeir, 0);

this.Controls.SetChildIndex(this.label2SideHeir, 0);

this.Controls.SetChildIndex(this.labelAngleHeir, 0);

this.Controls.SetChildIndex(this.textBox1SideHeir, 0);

this.Controls.SetChildIndex(this.textBox2SideHeir, 0);

this.Controls.SetChildIndex(this.textBoxAngleHeir, 0);

((System.ComponentModel.ISupportInitialize)(this.pictureTriangleHeir)).EndInit();

this.ResumeLayout(false);

this.PerformLayout();

}

#endregion

private System.Windows.Forms.Label labelParent1;

private System.Windows.Forms.Label labelAngleParent1;

private System.Windows.Forms.Label label2SideParent1;

private System.Windows.Forms.Label label1SideParent1;

private System.Windows.Forms.Label label1SideParent1v;

private System.Windows.Forms.Label label2SideParent1v;

private System.Windows.Forms.Label labelAngleParent1v;

private System.Windows.Forms.Label labelParent2;

private System.Windows.Forms.Label labelAngleParent2v;

private System.Windows.Forms.Label label2SideParent2v;

private System.Windows.Forms.Label label1SideParent2v;

private System.Windows.Forms.Label labelAngleParent2;

private System.Windows.Forms.Label label2SideParent2;

private System.Windows.Forms.Label label1SideParent2;

private System.Windows.Forms.Label labelAngleHeir;

private System.Windows.Forms.Label label2SideHeir;

private System.Windows.Forms.Label label1SideHeir;

private System.Windows.Forms.PictureBox pictureTriangleHeir;

private System.Windows.Forms.Label labelHeir;

private System.Windows.Forms.TextBox textBox1SideHeir;

private System.Windows.Forms.TextBox textBox2SideHeir;

private System.Windows.Forms.TextBox textBoxAngleHeir;

}

}

Program.cs

using System;

using System.Collections.Generic;

using System.Linq;

using System.Threading.Tasks;

using System.Windows.Forms;

namespace OOP\_lab5\_6

{

static class Program

{

/// <summary>

/// The main entry point for the application.

/// </summary>

[STAThread]

static void Main()

{

Application.EnableVisualStyles();

Application.SetCompatibleTextRenderingDefault(false);

Application.Run(new FormEnterParents());

}

}

}