

Nama : Farhan Kurniawan

NIM : 2311104073

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1. UnitTest.cs

File ini berisi kelas UnitTest1 yang menggunakan pustaka Microsoft.VisualStudio.TestTools.UnitTesting untuk menguji metode CariNilaiPangkat. Terdapat dua metode uji yang aktif: TestPangkatNormal, yang menguji kasus umum seperti 2 pangkat 3, dan TestPangkatZero, yang menguji kasus 0 pangkat 0. File ini menunjukkan adanya uji unit untuk memastikan fungsi pangkat bekerja sebagaimana mestinya, meskipun terdapat method x yang tidak lengkap dan perlu diperbaiki atau dihapus.

```
using Microsoft.VisualStudio.TestTools.UnitTesting;
using JurnalModul12_2311104041;
namespace UnitTest
{
    [TestClass]
    public class UnitTest1
    {
        [TestMethod]
        public void TestPangkatNormal()
        {
            Assert.AreEqual(8, Helper.CariNilaiPangkat(2, 3));
        }

        [TestMethod]
        public void TestPangkatZero()
        {
            Assert.AreEqual(1, Helper.CariNilaiPangkat(0, 0));
        }

        [TestMethod]
        public void x
    }
}
```

2. Helper.cs

File ini berisi kelas Helper yang menyediakan metode statis CariNilaiPangkat, yang berfungsi untuk menghitung hasil pangkat dari dua bilangan bulat a dan b. Metode ini mencakup penanganan untuk kasus-kasus khusus seperti $b = 0$, $b < 0$, nilai input yang melebihi batas ($a > 100$ atau $b > 10$), serta pengecekan overflow menggunakan blok checked agar hasil perhitungan tetap aman dan terkendali. Nilai-nilai khusus akan menghasilkan kode kesalahan seperti -1, -2, atau -3.

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

namespace JurnalModul12_2311104041
{
    public class Helper
```

```

{
    public static int CariNilaiPangkat(int a, int b)
    {
        if (b == 0) return 1;
        if (b < 0) return -1;
        if (b > 10 || a > 100) return -2;

        try
        {
            checked
            {
                int result = 1;
                for (int i = 0; i < b; i++)
                {
                    result *= a;
                }
                return result;
            }
        }
        catch (System.OverflowException)
        {
            return -3;
        }
    }
}

```

3. Form1.cs

File ini adalah bagian logika dari antarmuka pengguna utama (Windows Form). Di dalamnya terdapat logika event handler untuk tombol buttonCek, yang akan mengambil input dari dua textbox (textBoxA dan textBoxB), memprosesnya melalui fungsi CariNilaiPangkat di Helper.cs, dan menampilkan hasilnya di labelOutput. File ini juga menangani validasi input agar pengguna hanya bisa memasukkan bilangan bulat valid.

```

using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;
using static System.Windows.Forms.VisualStyles.VisualStyleElement;

namespace JurnalModul12_2311104041
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private void buttonCek_Click(object sender, EventArgs e)
        {
            if (int.TryParse(textBoxA.Text, out int a) &&
                int.TryParse(textBoxB.Text, out int b))
            {

```

```

        int hasil = Helper.CariNilaiPangkat(a, b);
        labelOutput.Text = $"Hasil Output: {hasil}";
    }
    else
    {
        labelOutput.Text = "Hasil Output: Input tidak valid!";
    }
}

private void labelTitle_Click(object sender, EventArgs e)
{
}

private void Form1_Load(object sender, EventArgs e)
{
}
}
}

```

4. Form1.Designer.cs

File ini secara otomatis dihasilkan oleh Visual Studio dan bertanggung jawab untuk mendefinisikan serta mengatur elemen UI seperti textbox, label, button, panel, dan gaya visual pada Form1. Komponen visual seperti textBoxA, textBoxB, buttonCek, dan labelOutput didefinisikan dan dikustomisasi dari segi ukuran, warna, font, serta posisi. File ini juga menyertakan custom OnPaint yang menambahkan efek gradasi pada latar belakang form.

```

using System;
using System.Drawing;
using System.Drawing.Drawing2D;
using System.Windows.Forms;

namespace JurnalModul12_2311104041
{
    partial class Form1
    {
        private System.ComponentModel.IContainer components = null;
        private System.Windows.Forms.TextBox textBoxA;
        private System.Windows.Forms.TextBox textBoxB;
        private System.Windows.Forms.Button buttonCek;
        private System.Windows.Forms.Label labelOutput;
        private System.Windows.Forms.Label labelA;
        private System.Windows.Forms.Label labelB;
        private System.Windows.Forms.Panel panelResult;
        private System.Windows.Forms.Label labelTitle;
        private System.Windows.Forms.Panel panelHeader;

        protected override void Dispose(bool disposing)
        {
            if (disposing && (components != null))
            {
                components.Dispose();
            }
            base.Dispose(disposing);
        }

        protected override void OnPaint(PaintEventArgs e)
        {

```

```

        base.OnPaint(e);
        using (LinearGradientBrush brush = new LinearGradientBrush(
            this.ClientRectangle,
            Color.FromArgb(240, 240, 250),
            Color.FromArgb(225, 225, 245),
            LinearGradientMode.Vertical))
        {
            e.Graphics.FillRectangle(brush, this.ClientRectangle);
        }
    }

    private void InitializeComponent()
    {
        this.textBoxA = new System.Windows.Forms.TextBox();
        this.textBoxB = new System.Windows.Forms.TextBox();
        this.buttonCek = new System.Windows.Forms.Button();
        this.labelOutput = new System.Windows.Forms.Label();
        this.labelA = new System.Windows.Forms.Label();
        this.labelB = new System.Windows.Forms.Label();
        this.panelResult = new System.Windows.Forms.Panel();
        this.labelTitle = new System.Windows.Forms.Label();
        this.panelHeader = new System.Windows.Forms.Panel();
        this.panelResult.SuspendLayout();
        this.panelHeader.SuspendLayout();
        this.SuspendLayout();
        //
        // textBoxA
        //
        this.textBoxA.BackColor = System.Drawing.Color.White;
        this.textBoxA.BorderStyle =
System.Windows.Forms.BorderStyle.FixedSingle;
        this.textBoxA.Font = new System.Drawing.Font("Segoe UI",
12F, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, ((byte)(0)));
        this.textBoxA.ForeColor =
System.Drawing.Color.FromArgb(((int)(((byte)(40))))),
((int)(((byte)(40))))), ((int)(((byte)(40)))));
        this.textBoxA.Location = new System.Drawing.Point(40, 103);
        this.textBoxA.Name = "textBoxA";
        this.textBoxA.Size = new System.Drawing.Size(320, 39);
        this.textBoxA.TabIndex = 0;
        //
        // textBoxB
        //
        this.textBoxB.BackColor = System.Drawing.Color.White;
        this.textBoxB.BorderStyle =
System.Windows.Forms.BorderStyle.FixedSingle;
        this.textBoxB.Font = new System.Drawing.Font("Segoe UI",
12F, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, ((byte)(0)));
        this.textBoxB.ForeColor =
System.Drawing.Color.FromArgb(((int)(((byte)(40))))),
((int)(((byte)(40))))), ((int)(((byte)(40)))));
        this.textBoxB.Location = new System.Drawing.Point(40, 168);
        this.textBoxB.Name = "textBoxB";
        this.textBoxB.Size = new System.Drawing.Size(320, 39);
        this.textBoxB.TabIndex = 1;
        //
        // buttonCek
        //
        this.buttonCek.BackColor =
System.Drawing.Color.FromArgb(((int)(((byte)(63))))),
((int)(((byte)(81))))), ((int)(((byte)(181)))));

```

```

        this.buttonCek.FlatAppearance.BorderSize = 0;
        this.buttonCek.FlatStyle =
System.Windows.Forms.FlatStyle.Flat;
        this.buttonCek.Font = new System.Drawing.Font("Segoe UI",
12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point,
((byte)(0)));
        this.buttonCek.ForeColor = System.Drawing.Color.White;
        this.buttonCek.Location = new System.Drawing.Point(40, 217);
        this.buttonCek.Name = "buttonCek";
        this.buttonCek.Size = new System.Drawing.Size(320, 40);
        this.buttonCek.TabIndex = 2;
        this.buttonCek.Text = "Hitung Pangkat";
        this.buttonCek.UseVisualStyleBackColor = false;
        this.buttonCek.Click += new
System.EventHandler(this.buttonCek_Click);
        //
        // labelOutput
        //
        this.labelOutput.AutoSize = true;
        this.labelOutput.Font = new System.Drawing.Font("Segoe UI",
12F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point,
((byte)(0)));
        this.labelOutput.ForeColor =
System.Drawing.Color.FromArgb(((int)(((byte)(63)))),
((int)(((byte)(81)))), ((int)(((byte)(181)))));
        this.labelOutput.Location = new System.Drawing.Point(10,
18);

        this.labelOutput.Name = "labelOutput";
        this.labelOutput.Size = new System.Drawing.Size(158, 32);
        this.labelOutput.TabIndex = 3;
        this.labelOutput.Text = "Hasil Output";
        //
        // labelA
        //
        this.labelA.AutoSize = true;
        this.labelA.Font = new System.Drawing.Font("Segoe UI", 10F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point,
((byte)(0)));
        this.labelA.ForeColor =
System.Drawing.Color.FromArgb(((int)(((byte)(40)))),
((int)(((byte)(40)))), ((int)(((byte)(40)))));
        this.labelA.Location = new System.Drawing.Point(40, 80);
        this.labelA.Name = "labelA";
        this.labelA.Size = new System.Drawing.Size(68, 28);
        this.labelA.TabIndex = 4;
        this.labelA.Text = "Angka";
        //
        // labelB
        //
        this.labelB.AutoSize = true;
        this.labelB.Font = new System.Drawing.Font("Segoe UI", 10F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point,
((byte)(0)));
        this.labelB.ForeColor =
System.Drawing.Color.FromArgb(((int)(((byte)(40)))),
((int)(((byte)(40)))), ((int)(((byte)(40)))));
        this.labelB.Location = new System.Drawing.Point(40, 145);
        this.labelB.Name = "labelB";
        this.labelB.Size = new System.Drawing.Size(82, 28);
        this.labelB.TabIndex = 5;
        this.labelB.Text = "Pangkat";
        //
        // panelResult

```

```

        //
        this.panelResult.BackColor =
System.Drawing.Color.FromArgb(((int)(((byte)(240))))),
((int)(((byte)(240))))), ((int)(((byte)(250))))));
        this.panelResult.BorderStyle =
System.Windows.Forms.BorderStyle.FixedSingle;
        this.panelResult.Controls.Add(this.labelOutput);
        this.panelResult.Location = new System.Drawing.Point(40,
277);

        this.panelResult.Name = "panelResult";
        this.panelResult.Size = new System.Drawing.Size(320, 60);
        this.panelResult.TabIndex = 6;
        //
        // labelTitle
        //
        this.labelTitle.AutoSize = true;
        this.labelTitle.Font = new System.Drawing.Font("Segoe UI",
16F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point,
((byte)(0)));
        this.labelTitle.ForeColor = System.Drawing.Color.White;
        this.labelTitle.Location = new System.Drawing.Point(12, 15);
        this.labelTitle.Name = "labelTitle";
        this.labelTitle.Size = new System.Drawing.Size(306, 45);
        this.labelTitle.TabIndex = 0;
        this.labelTitle.Text = "Kalkulator Pangkat";
        this.labelTitle.Click += new
System.EventHandler(this.labelTitle_Click);
        //
        // panelHeader
        //
        this.panelHeader.BackColor =
System.Drawing.Color.FromArgb(((int)(((byte)(63))))),
((int)(((byte)(81))))), ((int)(((byte)(181))))));
        this.panelHeader.Controls.Add(this.labelTitle);
        this.panelHeader.Dock = System.Windows.Forms.DockStyle.Top;
        this.panelHeader.Location = new System.Drawing.Point(0, 0);
        this.panelHeader.Name = "panelHeader";
        this.panelHeader.Size = new System.Drawing.Size(400, 60);
        this.panelHeader.TabIndex = 7;
        //
        // Form1
        //
        this.BackColor = System.Drawing.Color.White;
        this.ClientSize = new System.Drawing.Size(400, 360);
        this.Controls.Add(this.panelHeader);
        this.Controls.Add(this.panelResult);
        this.Controls.Add(this.labelB);
        this.Controls.Add(this.labelA);
        this.Controls.Add(this.buttonCek);
        this.Controls.Add(this.textBoxB);
        this.Controls.Add(this.textBoxA);
        this.Font = new System.Drawing.Font("Segoe UI", 8.25F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point,
((byte)(0)));
        this.FormBorderStyle =
System.Windows.Forms.FormBorderStyle.FixedSingle;
        this.MaximizeBox = false;
        this.Name = "Form1";
        this.StartPosition =
System.Windows.Forms.FormStartPosition.CenterScreen;
        this.Text = "Modul 12 - Pangkat";
        this.Load += new System.EventHandler(this.Form1_Load);
        this.panelResult.ResumeLayout(false);

```

```
        this.panelResult.PerformLayout();  
        this.panelHeader.ResumeLayout(false);  
        this.panelHeader.PerformLayout();  
        this.ResumeLayout(false);  
        this.PerformLayout();  
    }  
}
```

Hasil Output dan Unit Test



Modul 12 - Pangkat

Kalkulator Pangkat

Angka

Pangkat

Hitung Pangkat

Hasil Output: 4

Kalkulator Pangkat

Angka

2

Pangkat

2

Hitung Pangkat**Hasil Output: 4**

Test Explorer

Ready

Search (Ctrl+I)

1 Warning 0 Errors

Test	Duration	Traits	Error Message
UnitTest (5)	107 ms		
UnitTest (5)	107 ms		
UnitTest1 (5)	107 ms		
TestInputBesar	107 ms		
TestOverflow	< 1 ms		
TestPangkatNegatif	< 1 ms		
TestPangkatNormal	< 1 ms		
TestPangkatZero	< 1 ms		

Run | Debug

Group Summary

UnitTest1

Tests in group: 5

Total Duration: 16

Outcomes

5 Passed