



TUGAS PENDAHULUAN
KONSTRUKSI PERANGKAT LUNAK
MODUL 12

D
I
S
U
S
U
N

OLEH :
TIURMA GRACE ANGELINA – 2311104042
S1-SE07-02

Dosen :
YIS

Prodi S1 Rekaya Perangkat Lunak
Direktorat Kampus Purwokerto

1. MEMBUAT GUI SEDERHANA

Form1.cs

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

namespace tpmod12_2311104042
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        public string CariTandaBilangan(int a)
        {
            if (a < 0)
                return "Negatif";
            else if (a > 0)
                return "Positif";
            else
                return "Nol";
        }

        private void button1_Click(object sender, EventArgs e)
        {
            int input;
            if (int.TryParse(textBox1.Text, out input))
            {
                label1.Text = TandaBilanganHelper.CariTandaBilangan(input);
            }
            else
            {
                label1.Text = "Input tidak valid!";
            }
        }
    }
}
```

```

    }

    private void textBox1_TextChanged(object sender, EventArgs e)
    {

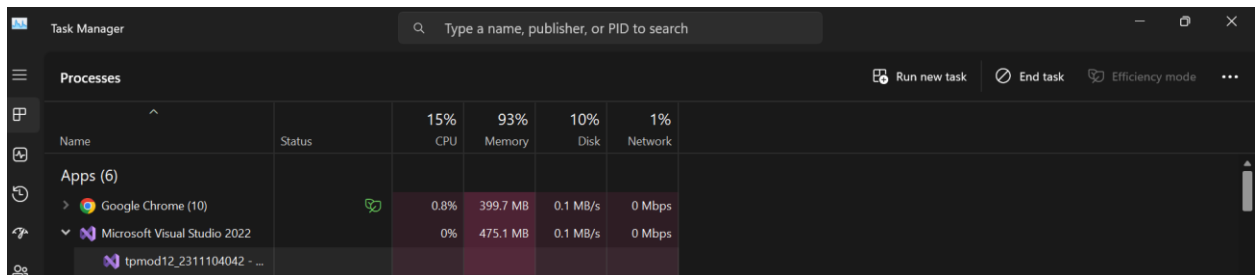
    }

}
}

```

Output :

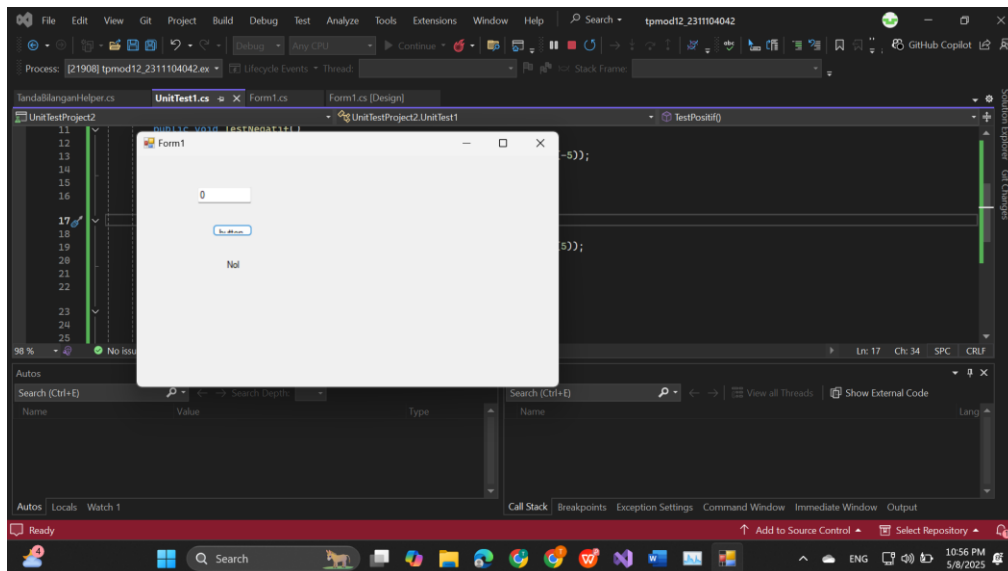
CPU usage Awal



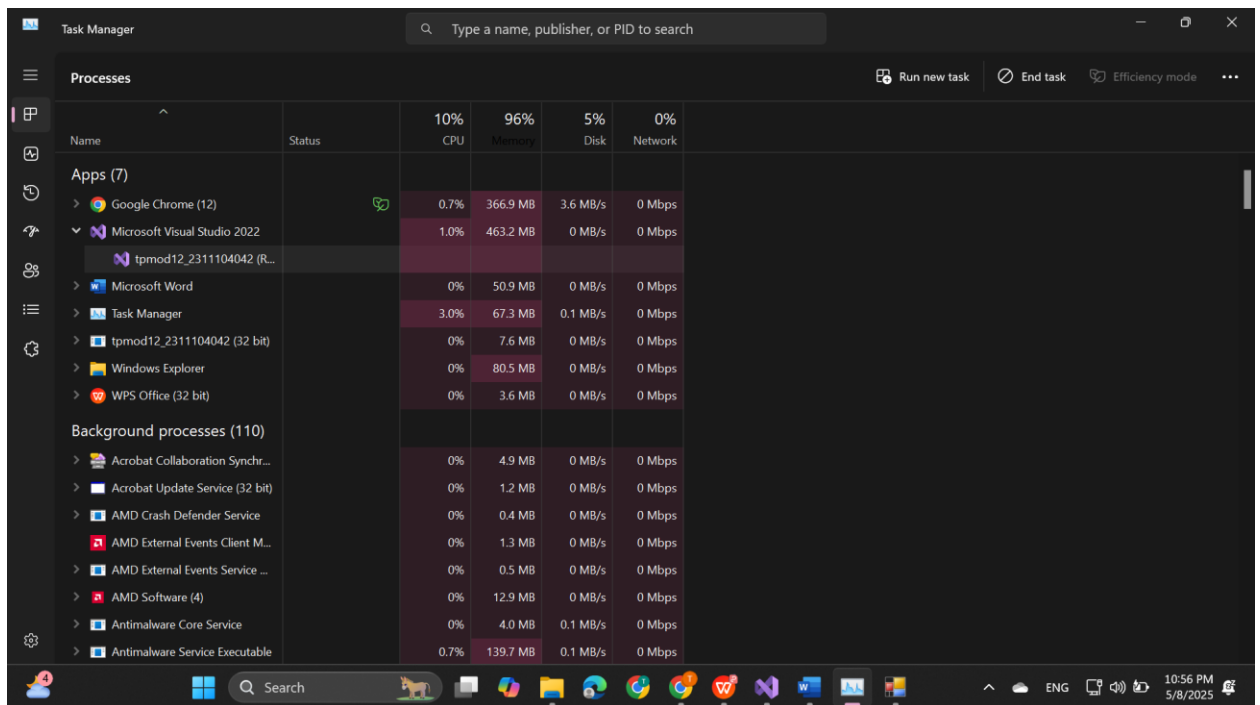
The screenshot shows the Windows Task Manager 'Processes' tab. The 'Apps' section is expanded, showing the following data:

Name	Status	CPU	Memory	Disk	Network
Google Chrome (10)		0.8%	399.7 MB	0.1 MB/s	0 Mbps
Microsoft Visual Studio 2022		0%	475.1 MB	0.1 MB/s	0 Mbps
tpmod12_2311104042 - ...					

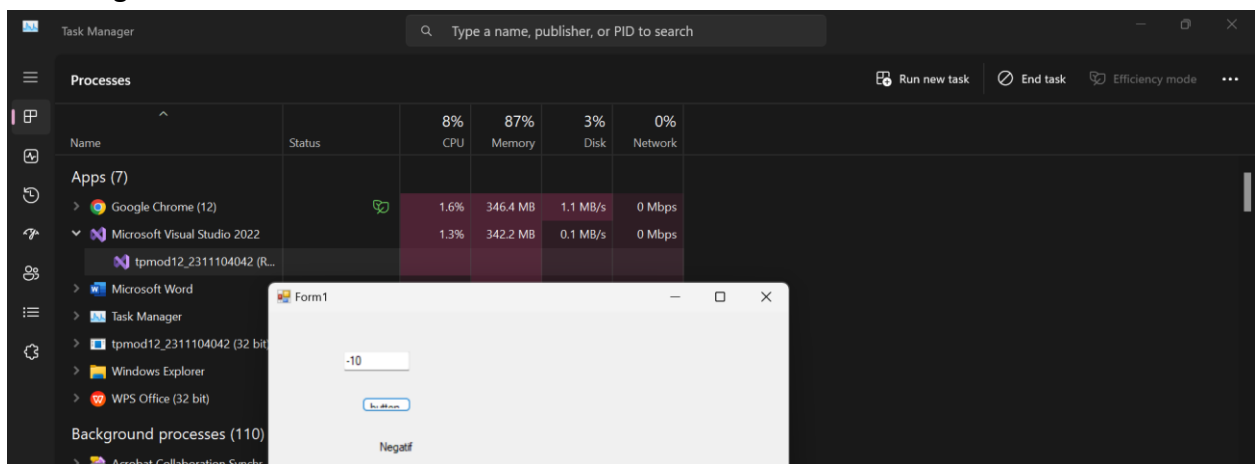
Test 1 bilangan nol



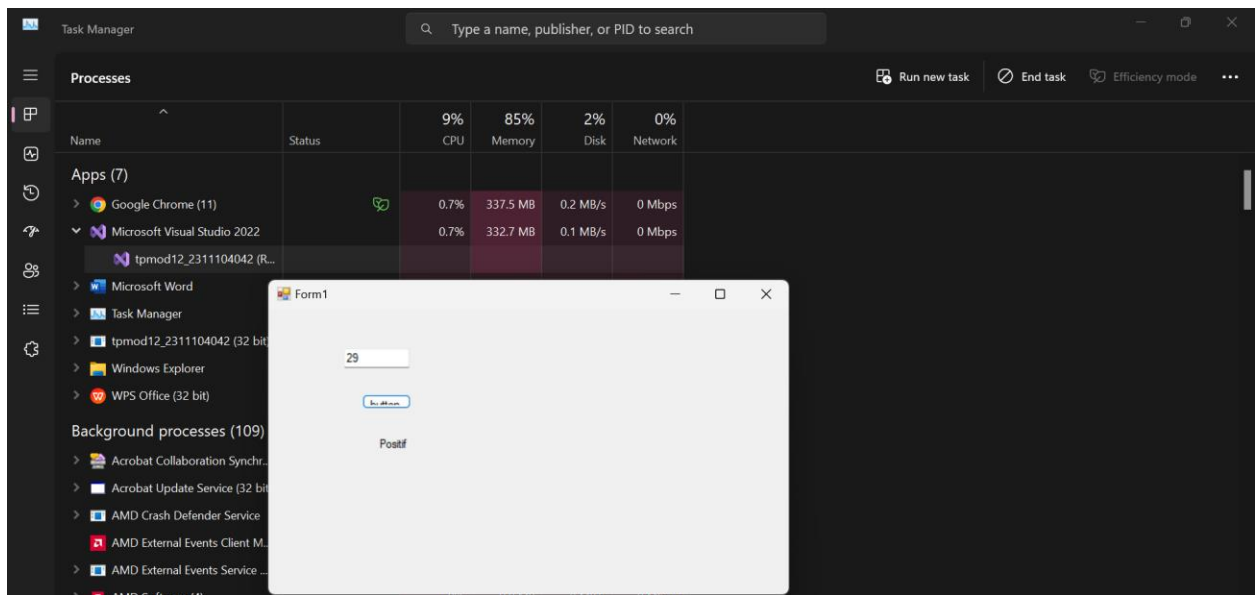
CPU usage setelah test 1



CPU usage setelah test 2



CPU usage setelah test 3



The screenshot shows the Windows Task Manager interface. The 'Processes' tab is selected, displaying a list of running applications and background processes. The CPU usage is 9%. A small window titled 'Form1' is overlaid on the Task Manager, showing a text input field with the number '29' and a 'Postif' button.

Name	Status	CPU	Memory	Disk	Network
Apps (7)					
Google Chrome (11)		0.7%	337.5 MB	0.2 MB/s	0 Mbps
Microsoft Visual Studio 2022		0.7%	332.7 MB	0.1 MB/s	0 Mbps
tpmod12_2311104042 (R...					
Background processes (109)					
Acrobat Collaboration Synchr...					
Acrobat Update Service (32 bit)					
AMD Crash Defender Service					
AMD External Events Client M...					
AMD External Events Service ...					
AMD Software (64)					

Melakukan unit testing

UnitTest1.cs

```
using System;
using Microsoft.VisualStudio.TestTools.UnitTesting;
using tpmod12_2311104042;

namespace UnitTestProject2
{
    [TestClass]
    public class UnitTest1
    {
        [TestMethod]
        public void TestNegatif()
        {
            Assert.AreEqual("Negatif", TandaBilanganHelper.CariTandaBilangan(-5));
        }

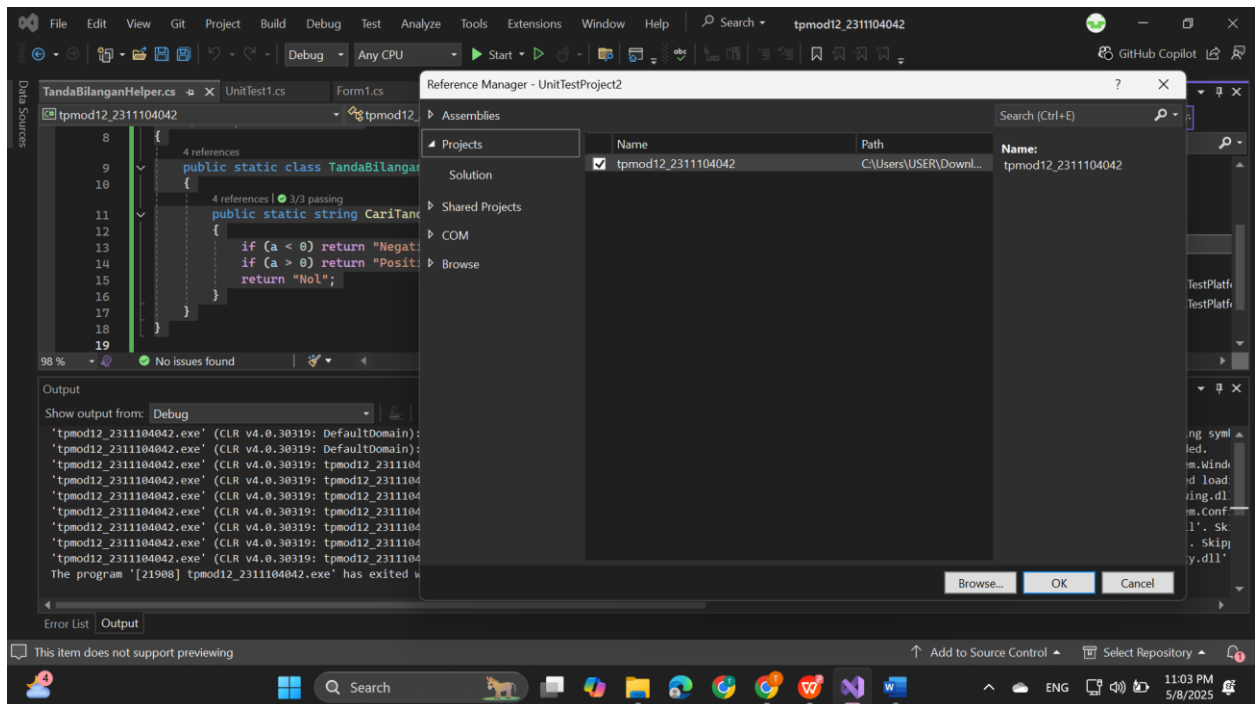
        [TestMethod]
        public void TestPositif()
        {
            Assert.AreEqual("Positif", TandaBilanganHelper.CariTandaBilangan(5));
        }

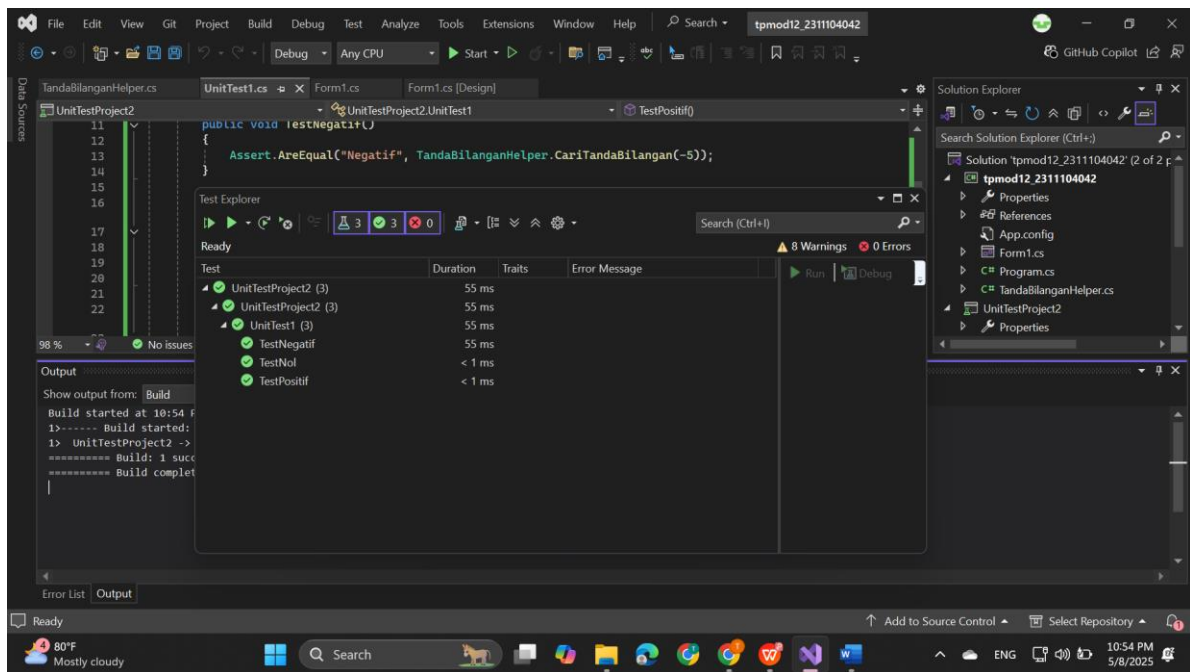
        [TestMethod]
        public void TestNol()
        {
            Assert.AreEqual("Nol", TandaBilanganHelper.CariTandaBilangan(0));
        }
    }
}
```

TandaBilanganHelper.cs

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

namespace tpm0d12_2311104042
{
    public static class TandaBilanganHelper
    {
        public static string CariTandaBilangan(int a)
        {
            if (a < 0) return "Negatif";
            if (a > 0) return "Positif";
            return "Nol";
        }
    }
}
```





COMMIT :

```
C:\WINDOWS\system32\cmd.exe
*****
** Visual Studio 2022 Developer Command Prompt v17.13.0
** Copyright (c) 2022 Microsoft Corporation
*****

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\12_Performance_Analysis_Unit_Testing_dan_Debugging\tpmod12_2311104042>git add tpmod12_2311104042

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\12_Performance_Analysis_Unit_Testing_dan_Debugging\tpmod12_2311104042>git commit -m "up tpmod12 gui with unit testing"
[main bb918bd] up tpmod12 gui with unit testing
13 files changed, 1047 insertions(+)
create mode 100644 12_Performance_Analysis_Unit_Testing_dan_Debugging/tpmod12_2311104042/.gitignore
create mode 100644 12_Performance_Analysis_Unit_Testing_dan_Debugging/tpmod12_2311104042/tpmod12_2311104042/App.config
create mode 100644 12_Performance_Analysis_Unit_Testing_dan_Debugging/tpmod12_2311104042/tpmod12_2311104042/Form1.Designer.cs
create mode 100644 12_Performance_Analysis_Unit_Testing_dan_Debugging/tpmod12_2311104042/tpmod12_2311104042/Form1.cs
create mode 100644 12_Performance_Analysis_Unit_Testing_dan_Debugging/tpmod12_2311104042/tpmod12_2311104042/Form1.resx
create mode 100644 12_Performance_Analysis_Unit_Testing_dan_Debugging/tpmod12_2311104042/tpmod12_2311104042/Program.cs
create mode 100644 12_Performance_Analysis_Unit_Testing_dan_Debugging/tpmod12_2311104042/tpmod12_2311104042/Properties/AssemblyInfo.cs
create mode 100644 12_Performance_Analysis_Unit_Testing_dan_Debugging/tpmod12_2311104042/tpmod12_2311104042/Properties/Resources.Designer.cs
create mode 100644 12_Performance_Analysis_Unit_Testing_dan_Debugging/tpmod12_2311104042/tpmod12_2311104042/Properties/Settings.Designer.cs
create mode 100644 12_Performance_Analysis_Unit_Testing_dan_Debugging/tpmod12_2311104042/tpmod12_2311104042/Properties/Settings.settings
create mode 100644 12_Performance_Analysis_Unit_Testing_dan_Debugging/tpmod12_2311104042/tpmod12_2311104042/TandaBilanganHelper.cs
create mode 100644 12_Performance_Analysis_Unit_Testing_dan_Debugging/tpmod12_2311104042/tpmod12_2311104042/tpmod12_2311104042.csproj
```


Penjelasan :

1. Logika Inti

Terdapat fungsi `CariTandaBilangan(int a)` di kelas `TandaBilanganHelper` yang berfungsi untuk mengevaluasi bilangan:

```
public static string CariTandaBilangan(int a)
{
    if (a < 0) return "Negatif";
    if (a > 0) return "Positif";
    return "Nol";
}
```

- Jika bilangan lebih kecil dari 0 → return "Negatif"
- Jika bilangan lebih besar dari 0 → return "Positif"
- Jika sama dengan 0 → return "Nol"

2. Interaksi GUI

Saat tombol ditekan (`button1_Click`), input dari `textBox1` diubah ke integer dan kemudian hasil evaluasi dari `TandaBilanganHelper.CariTandaBilangan` ditampilkan di `label1`.

3. Unit Testing

Terdapat 3 unit test (`UnitTest1.cs`) untuk memverifikasi bahwa fungsi `CariTandaBilangan` bekerja dengan benar:

```
[TestMethod]
public void TestNegatif() => Assert.AreEqual("Negatif",
TandaBilanganHelper.CariTandaBilangan(-5));
```

```
[TestMethod]
public void TestPositif() => Assert.AreEqual("Positif",
TandaBilanganHelper.CariTandaBilangan(5));
```

```
[TestMethod]
public void TestNol() => Assert.AreEqual("Nol",
TandaBilanganHelper.CariTandaBilangan(0));
```

4. Profiling CPU & Memory

Pengamatan dilakukan dengan menjalankan aplikasi dan menggunakan tools seperti Task Manager untuk melihat pemakaian sumber daya. Berikut hasil observasinya:

- Saat program berjalan tanpa input:
 - CPU usage: stabil di kisaran rendah (sekitar 0-1%)
 - Memory usage: konstan dan tidak mengalami lonjakan signifikan (sekitar beberapa MB, tergantung sistem)
- Saat program menerima input angka dan tombol ditekan:
 - CPU usage: tidak menunjukkan lonjakan; tetap di angka rendah (maksimal $\pm 1\%$)
 - Memory usage: tidak mengalami perubahan signifikan

Kesimpulan:

- Program memiliki efisiensi yang baik karena logika yang dijalankan sangat ringan (hanya pemrosesan if-else).
- Tidak terjadi peningkatan signifikan pada penggunaan CPU atau memori, baik saat idle maupun saat interaksi dengan input dilakukan.