



**TUGAS PENDAHULUAN
KONSTRUKSI PERANGKAT LUNAK
MODUL 6**

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

Dosen :
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Prodi S1 Rekaya Perangkat Lunak
Direktorat Kampus Purwokerto

1. MENAMBAHKAN KODE AWAL SAYATUBEVIDEO

CODE :

1. SAYATUBEVIDEO.cs

```
using System;

public class SayaTubeVideo
{
    private int id;
    private string title;
    private int playCount;

    public SayaTubeVideo(string title)
    {
        Random random = new Random();
        this.id = random.Next(10000, 99999);

        this.title = title;
        this.playCount = 0;
    }

    public void IncreasePlayCount(int count)
    {
        this.playCount += count;
    }

    public void PrintVideoDetails()
    {
        Console.WriteLine($"ID Video: {id}");
        Console.WriteLine($"Judul: {title}");
        Console.WriteLine($"Jumlah Play: {playCount}");
    }
}
```

Penjelasan :

Atribut dalam class SayaTubeVideo

- **id:** ID unik video, dihasilkan secara random antara 10000 - 99999.
- **title:** Menyimpan judul video.
- **playCount:** Menyimpan jumlah view (play count) dari video.

Konstruktor SayaTubeVideo(string title)

- Menerima parameter title dan menyimpannya ke atribut title.
- Menghasilkan ID random menggunakan Random().

- Menginisialisasi playCount dengan 0 karena video baru belum ditonton.

Method IncreasePlayCount(int count)

- Menambahkan count ke playCount setiap kali method ini dipanggil.

Method PrintVideoDetails()

- Menampilkan informasi video seperti id, title, dan playCount.

2. Program.cs

```
class Program
{
    static void Main()
    {
        SayaTubeVideo video = new SayaTubeVideo("Tutorial Design By Contract – Tiurma Grace Angelina");
        video.IncreasePlayCount(100);
        video.PrintVideoDetails();
    }
}
```

Output :

The screenshot shows the Microsoft Visual Studio interface during debugging. The code editor displays the `Program.cs` file with the following content:

```
class Program
{
    static void Main()
    {
        SayaTubeVideo video = new SayaTubeVideo("Tutorial Design By Contract – Tiurma Grace Angelina");
        video.IncreasePlayCount(100);
        video.PrintVideoDetails();
    }
}
```

The Solution Explorer shows a single project named `tpmod6_2311104042` containing files `Program.cs` and `SayaTubeVideo.cs`. The Output window shows the application's console output:

```
ID Video: 21745
Judul: Tutorial Design By Contract - Tiurma Grace Angelina
Jumlah Play: 100
```

The status bar at the bottom right indicates the time is 8:58 PM and the date is 3/20/2025.

Penjelasan :

- Membuat objek SayaTubeVideo dengan judul "Tutorial Design By Contract -Tiurma Grace Angelina".
- Menambah 100 views menggunakan IncreasePlayCount(100).
- Mencetak detail video ke console.

Commit :

```
C:\WINDOWS\system32\cmd.exe
C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104042>git add .

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104042>git commit -m "menambahkan class SayaTubeVideo"
[main 8270e6b] menambahkan class SayaTubeVideo
43 files changed, 211 insertions(+), 8 deletions(-)
create mode 100644 .vs\tpmodul6_2311104042\FileContentIndex\45a37412-a546-44b2-b242-fb2e8e4068c9.vsidx
create mode 100644 .vs\tpmodul6_2311104042\FileContentIndex\b788e8d-85bb-414a-a2ce-16c3a0749c6c.vsidx
delete mode 100644 .vs\tpmodul6_2311104042\FileContentIndex\f469d8e6-a637-4dfe-ba64-a141936847d0.vsidx
create mode 100644 tpmodul6_2311104042\vs\VsWorkspaceState.json
create mode 100644 tpmodul6_2311104042\vs\slnx.sqlite
create mode 100644 tpmodul6_2311104042\vs\tpmodul6_2311104042\FileContentIndex\ba8f3b13-307d-4fa6-aea8-c958e89e37d8.vsidx
create mode 100644 tpmodul6_2311104042\vs\tpmodul6_2311104042\FileContentIndex\ea40a0e4-ea8b-4913-9bad-cd126ae6d399.vsidx
create mode 100644 tpmodul6_2311104042\vs\tpmodul6_2311104042\v17\.wsuo
create mode 100644 tpmodul6_2311104042\vs\tpmodul6_2311104042\v17\DocumentLayout.json
create mode 100644 tpmodul6_2311104042\SayaTubeVideo.cs
create mode 100644 tpmodul6_2311104042\bin\Debug\net8.0\tpmodul6_2311104042.deps.json
create mode 100644 tpmodul6_2311104042\bin\Debug\net8.0\tpmodul6_2311104042.dll
create mode 100644 tpmodul6_2311104042\bin\Debug\net8.0\tpmodul6_2311104042.exe
create mode 100644 tpmodul6_2311104042\bin\Debug\net8.0\tpmodul6_2311104042.pdb
create mode 100644 tpmodul6_2311104042\bin\Debug\net8.0\tpmodul6_2311104042.runtimeconfig.json
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\apphost.exe
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\ref\tpmodul6_2311104042.dll
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\refint\tpmodul6_2311104042.dll
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.assets.cache
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.csproj.BuildWithSkipAnalyzers
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.csproj.CoreCompileInputs.cache
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.csproj.FileListAbsolute.txt
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.dll
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.genruntimeconfig.cache
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.runtimeconfig.json
create mode 100644 tpmodul6_2311104042\obj\Release\net8.0\NETCoreApp,Version=v8.0.AssemblyAttributes.cs
create mode 100644 tpmodul6_2311104042\obj\Release\net8.0\tpmodul6_2311104042.AssemblyInfo.cs
create mode 100644 tpmodul6_2311104042\obj\Release\net8.0\tpmodul6_2311104042.AssemblyInfoInputs.cache
create mode 100644 tpmodul6_2311104042\obj\Release\net8.0\tpmodul6_2311104042.GeneratedMSBuildEditorConfig.editorconfig
create mode 100644 tpmodul6_2311104042\obj\Release\net8.0\tpmodul6_2311104042.GlobalUsings.g.cs
create mode 100644 tpmodul6_2311104042\obj\Release\net8.0\tpmodul6_2311104042.assets.cache

10:25 PM 3/20/2025

C:\WINDOWS\system32\cmd.exe
create mode 100644 tpmodul6_2311104042\vs\tpmodul6_2311104042\v17\.wsuo
create mode 100644 tpmodul6_2311104042\vs\tpmodul6_2311104042\v17\DocumentLayout.json
create mode 100644 tpmodul6_2311104042\SayaTubeVideo.cs
create mode 100644 tpmodul6_2311104042\bin\Debug\net8.0\tpmodul6_2311104042.deps.json
create mode 100644 tpmodul6_2311104042\bin\Debug\net8.0\tpmodul6_2311104042.dll
create mode 100644 tpmodul6_2311104042\bin\Debug\net8.0\tpmodul6_2311104042.exe
create mode 100644 tpmodul6_2311104042\bin\Debug\net8.0\tpmodul6_2311104042.pdb
create mode 100644 tpmodul6_2311104042\bin\Debug\net8.0\tpmodul6_2311104042.runtimeconfig.json
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\apphost.exe
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\ref\tpmodul6_2311104042.dll
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.assets.cache
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.csproj.BuildWithSkipAnalyzers
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.csproj.CoreCompileInputs.cache
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.csproj.FileListAbsolute.txt
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.dll
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.genruntimeconfig.cache
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.pdb
create mode 100644 tpmodul6_2311104042\obj\Debug\net8.0\tpmodul6_2311104042.sourceLink.json
create mode 100644 tpmodul6_2311104042\obj\Release\net8.0\NETCoreApp,Version=v8.0.AssemblyAttributes.cs
create mode 100644 tpmodul6_2311104042\obj\Release\net8.0\tpmodul6_2311104042.AssemblyInfo.cs
create mode 100644 tpmodul6_2311104042\obj\Release\net8.0\tpmodul6_2311104042.AssemblyInfoInputs.cache
create mode 100644 tpmodul6_2311104042\obj\Release\net8.0\tpmodul6_2311104042.GeneratedMSBuildEditorConfig.editorconfig
create mode 100644 tpmodul6_2311104042\obj\Release\net8.0\tpmodul6_2311104042.GlobalUsings.g.cs
create mode 100644 tpmodul6_2311104042\obj\Release\net8.0\tpmodul6_2311104042.assets.cache

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104042>git push origin main
Enumerating objects: 76, done.
Counting objects: 100% (76/76), done.
Delta compression using up to 12 threads
Compressing objects: 100% (56/56), done.
Writing objects: 100% (56/56), 122.79 KiB | 1.44 MiB/s, done.
Total 56 (delta 12), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (12/12), completed with 9 local objects.
To https://github.com/tiurmagrace/tpmodul6_2311104042.git
   651d652..8270e6b main -> main

C:\WINDOWS\system32\cmd.exe
10:25 PM 3/20/2025
```

2. MENAMBAHKAN IMPLEMENTASI DESIGN BY CONTRACT

Code :

SayaTubeVideo.cs

```
using System;

public class SayaTubeVideo
{
    private int id;
    private string title;
    private int playCount;

    public SayaTubeVideo(string title)
    {
        if (string.IsNullOrEmpty(title))
            throw new ArgumentException("Judul video tidak boleh kosong
atau null.");

        if (title.Length > 100)
            throw new ArgumentException("Judul video tidak boleh lebih dari
100 karakter.");

        Random random = new Random();
        this.id = random.Next(10000, 99999);
        this.title = title;
        this.playCount = 0;
    }

    public void IncreasePlayCount(int count)
    {
        if (count > 10000000)
            throw new ArgumentException("Penambahan play count tidak
boleh lebih dari 10.000.000.");

        try
        {
            checked
            {
                this.playCount += count;
            }
        }
        catch (OverflowException)
        {
```

```
        Console.WriteLine("Error: Play count melebihi batas maksimum
integer!");
    }
}

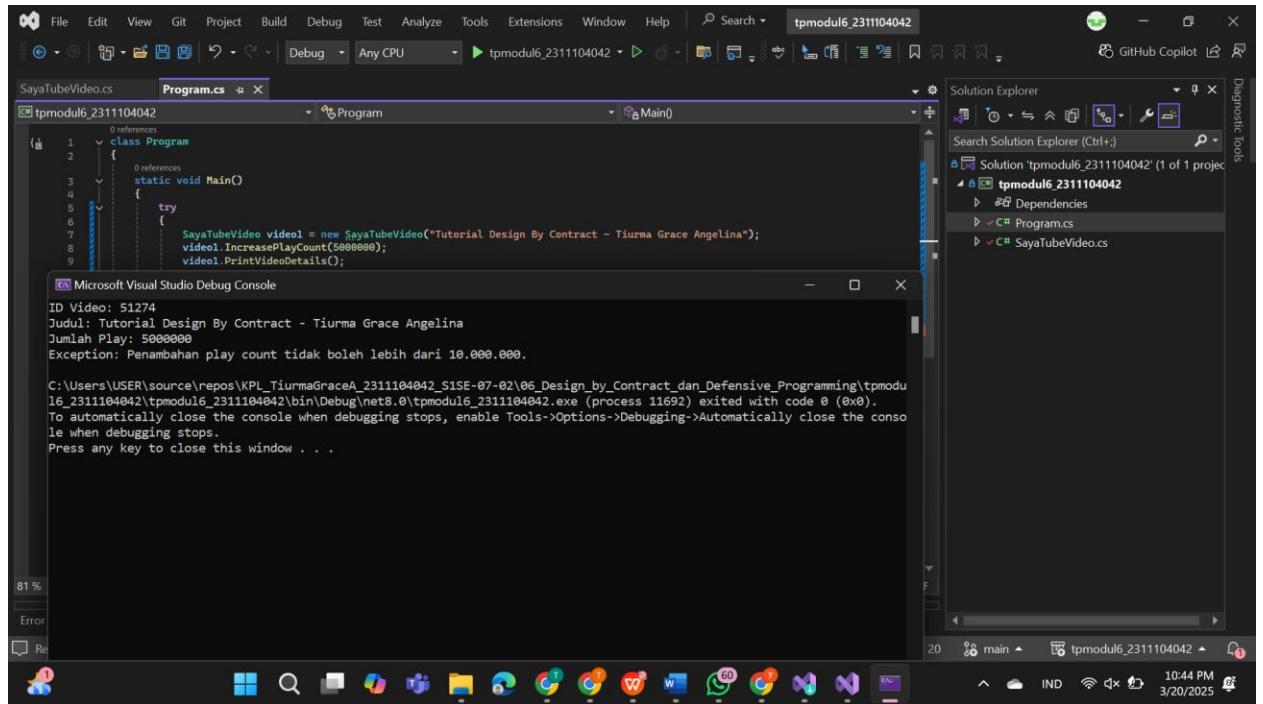
public void PrintVideoDetails()
{
    Console.WriteLine($"ID Video: {id}");
    Console.WriteLine($"Judul: {title}");
    Console.WriteLine($"Jumlah Play: {playCount}");
}
}
```

Program.cs

```
class Program
{
    static void Main()
    {
        try
        {
            SayaTubeVideo video1 = new SayaTubeVideo("Tutorial Design By
Contract – Tiurma Grace Angelina");
            video1.IncreasePlayCount(5000000);
            video1.PrintVideoDetails();

            SayaTubeVideo video2 = new SayaTubeVideo("Test Overflow");
            for (int i = 0; i < 10; i++)
            {
                video2.IncreasePlayCount(int.MaxValue);
            }
        }
        catch (Exception ex)
        {
            Console.WriteLine($"Exception: {ex.Message}");
        }
    }
}
```

Output :



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\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104042>git add .

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104042>git commit -m "implementasi design by contract"
[main 0296a41] implementasi design by contract
 21 files changed, 48 insertions(+), 17 deletions(-)
 create mode 100644 .vs\tpmodul6_2311104042\FileContentIndex\15a70e99-764b-4827-bc38-41df875f1d6f.vsidx
 create mode 100644 .vs\tpmodul6_2311104042\FileContentIndex\3b36c68d-a36c-4d97-8854-02f04ae5cc93.vsidx
 delete mode 100644 .vs\tpmodul6_2311104042\FileContentIndex\45a37412-a546-44b2-b242-fb2e8e4068c9.vsidx
 delete mode 100644 .vs\tpmodul6_2311104042\FileContentIndex\b7886e8d-85bb-414a-a2ce-16c340740c6c.vsidx

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104042>git push origin main
Enumerating objects: 53, done.
Counting objects: 100% (52/52), done.
Delta compression using up to 12 threads
Compressing objects: 100% (26/26), done.
Writing objects: 100% (29/29), 11.47 KiB | 435.00 KiB/s, done.
Total 29 (delta 13), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (13/13), completed with 12 local objects.
To https://github.com/tiurmagrace/tpmodul6_2311104042.git
 8278e6b..0296a41 main -> main

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104042>

```

Penjelasan :

1. Konstruktor SayaTubeVideo(string title)

```

public SayaTubeVideo(string title)
{
    if (string.IsNullOrEmpty(title))
    {
        throw new ArgumentException("Title cannot be empty or null.");
    }
}

```

```

throw new ArgumentException("Judul video tidak boleh kosong atau null.");

if (title.Length > 100)
    throw new ArgumentException("Judul video tidak boleh lebih dari 100
karakter.");

Random random = new Random();
this.id = random.Next(10000, 99999);
this.title = title;
this.playCount = 0;
}

```

Penjelasan:

- ✓ Tujuan: Membuat objek SayaTubeVideo dengan ID acak, judul, dan play count awal 0.
- ✓ Validasi:
 - Judul tidak boleh kosong atau null, jika iya → munculkan ArgumentException.
 - Judul maksimal 100 karakter, jika lebih → munculkan ArgumentException.
- ✓ Membuat ID acak: Menggunakan Random() untuk menghasilkan angka 5 digit antara 10000 - 99999.
- ✓ Menginisialisasi playCount = 0 karena video baru belum ditonton.

2. Fungsi IncreasePlayCount(int count)

```

public void IncreasePlayCount(int count)
{
    if (count > 10000000)
        throw new ArgumentException("Penambahan play count tidak boleh lebih
dari 10.000.000.");

    try
    {
        checked
        {
            this.playCount += count;
        }
    }
}

```

```
        catch (OverflowException)
    {
        Console.WriteLine("Error: Play count melebihi batas maksimum integer!");
    }
}
```

Penjelasan:

✓ Tujuan: Menambah jumlah play count dengan nilai count yang diberikan.

✓ Validasi:

- count tidak boleh lebih dari 10 juta, jika lebih → munculkan ArgumentException.

✓ Mencegah Overflow:

- Menggunakan checked untuk mencegah play count melebihi batas integer.
- Jika terjadi overflow, catch (OverflowException) akan menangkapnya dan menampilkan pesan error tanpa crash.

3. Fungsi PrintVideoDetails()

```
public void PrintVideoDetails()
{
    Console.WriteLine($"ID Video: {id}");
    Console.WriteLine($"Judul: {title}");
    Console.WriteLine($"Jumlah Play: {playCount}");
}
```

Penjelasan:

✓ Tujuan: Menampilkan informasi video.

✓ Output yang ditampilkan:

- ID video → Menunjukkan identitas unik video.
- Judul video → Nama video yang dibuat.
- Jumlah play count → Berapa kali video sudah ditonton.

4. Fungsi Main() untuk Pengujian

```
static void Main()
{
    try
    {
```

```

SayaTubeVideo video1 = new SayaTubeVideo("Tutorial Design By Contract –
Tiurma Grace Angelina");
video1.IncreasePlayCount(5000000);
video1.PrintVideoDetails();

// Uji validasi panjang judul
// SayaTubeVideo videoError = new SayaTubeVideo(new string('A', 101));

// Uji validasi play count > 10 juta
// video1.IncreasePlayCount(20000000);

// Uji overflow
SayaTubeVideo video2 = new SayaTubeVideo("Test Overflow");
for (int i = 0; i < 10; i++)
{
    video2.IncreasePlayCount(int.MaxValue);
}
catch (Exception ex)
{
    Console.WriteLine($"Exception: {ex.Message}");
}
}

```

Penjelasan:

- ✓ Membuat objek video1 dengan judul tertentu.
- ✓ Menambah play count sebesar 5.000.000 dan mencetak detail video.
- ✓ Pengujian (dapat diaktifkan dengan menghapus // di depan baris kode):
 - Judul lebih dari 100 karakter → Harusnya gagal dan muncul ArgumentException.
 - Menambah play count lebih dari 10 juta → Harusnya gagal dengan ArgumentException.
 - Uji overflow → Menggunakan loop untuk menambahkan int.MaxValue, seharusnya ditangani oleh OverflowException.
 - ✓ Blok try-catch menangkap error agar program tidak crash jika terjadi exception.

link github :

https://github.com/tiurmagrace/tpmodul6_2311104042.git

https://github.com/tiurmagrace/KPL_TiurmaGraceA_2311104042_S1SE-07-02.git