

## **TUGAS PENDAHULUAN MODUL 6**



Disusun Oleh :

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**PROGRAM STUDI SOFTWARE ENGINEERING**

**DIREKTORAT KAMPUS PURWOKERTO**

**TELKOM UNIVERSITY PURWOKERTO**

**2025**

## 1. MEMBUAT PROJECT CONSOLE/TANPA GUI

## Configure your new project

Console App C# Linux macOS Windows Console

Project name

tpmodule6\_2311104065

Location

C:\KPL\_Rengganis-Tantri-Pramudita\_2311104065\_SE0702\06\_Design\_by\_Contract\_dan\_Defensive\_Programming

Solution name ⓘ

tpmodule6\_2311104065

☐ Place solution and project in the same directory

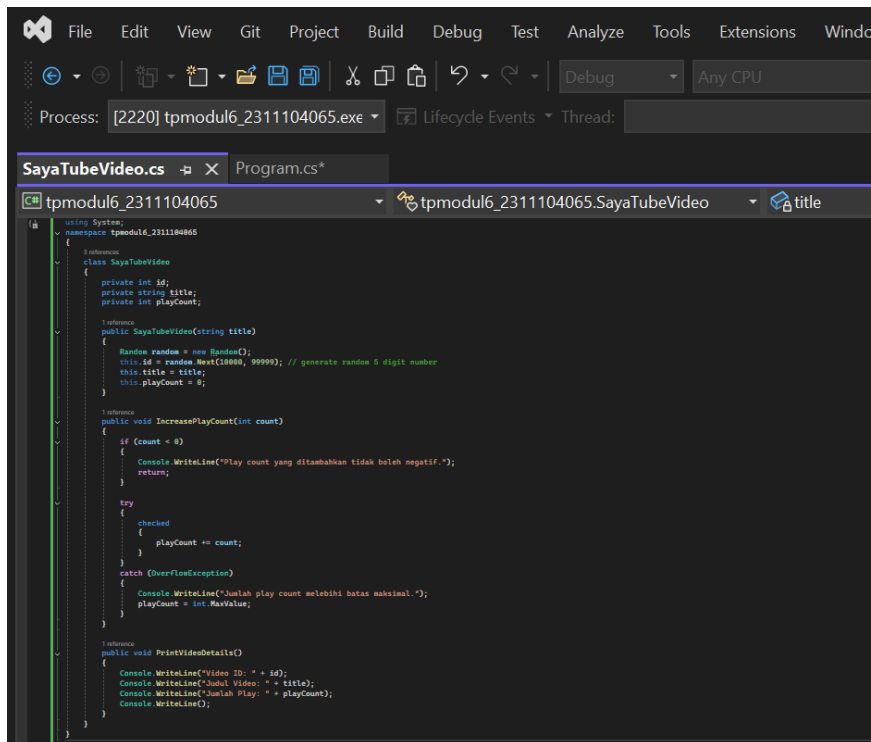
Project will be created in "C:\KPL\_Rengganis-Tantri-Pramudita\_2311104065\_SE0702\06\_Design\_by\_Contract\_dan\_Defensive\_Programming\tpmodule6\_2311104065\tpmodule6\_2311104065"

## 2. MELAKUKAN GIT COMMIT PADA PROJECT YANG DIBUAT

```
C:\Windows\system32\cmd.exe
C:\WPL_Rengganis-Tantri-Pramudita_2311104065_SE0702\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6.2311104065>git add .
C:\WPL_Rengganis-Tantri-Pramudita_2311104065_SE0702\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6.2311104065>git commit -m
"inisialisasi project
23 files changed, 340 insertions(+)"
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/.vs/ProjectEvaluation/tpmodul6.2311104065.met
adada.v9.bin
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/.vs/ProjectEvaluation/tpmodul6.2311104065.pro
jects.v9.bin
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/.vs/ProjectEvaluation/tpmodul6.2311104065.str
ings.v9.bin
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/.vs/tpmodul6.2311104065/DesignTimeBuild/.dtbc
ache.v2
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/.vs/tpmodul6.2311104065/FileContentIndex/beac
db89-af23-4065-88ac-79a8bbac4fa7.vsixd
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/.vs/tpmodul6.2311104065/v17/.fudtcache.v2
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/.vs/tpmodul6.2311104065/v17/.suo
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/.vs/tpmodul6.2311104065/v17/DocumentLayout.ba
ckup.json
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/.vs/tpmodul6.2311104065/v17/DocumentLayout.js
on
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/tpmodul6.2311104065.sln
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/tpmodul6.2311104065/Program.cs
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/tpmodul6.2311104065/obj/Debug/net8.0/.NETCore
App,Version=v8.0.AssemblyAttributes.cs
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/tpmodul6.2311104065/obj/Debug/net8.0/tpmodul6
.2311104065.AssemblyInfo.cs
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/tpmodul6.2311104065/obj/Debug/net8.0/tpmodul6
.2311104065.AssemblyInfoInputs.cache
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/tpmodul6.2311104065/obj/Debug/net8.0/tpmodul6
.2311104065.GeneratedMSBuildEditorConfig.editorconfig
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tpmodul6.2311104065/tpmodul6.2311104065/obj/Debug/net8.0/tpmodul6
```

### 3. MENAMBAHKAN KODE AWAL SAYATUBEVIDEO

- SayaTubeVideo.cs



```
using System;
namespace tpmodul6_2311104065
{
    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); // generate random 5 digit number
            this.title = title;
            this.playCount = 0;
        }

        public void IncreasePlayCount(int count)
        {
            if (count < 0)
            {
                Console.WriteLine("Play count yang ditambahkan tidak boleh negatif.");
                return;
            }

            try
            {
                checked
                {
                    playCount += count;
                }
            }
            catch (OverflowException)
            {
                Console.WriteLine("Jumlah play count melebihi batas maksimal.");
                playCount = int.MaxValue;
            }
        }

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

```
using System;
namespace tpmodul6_2311104065
{
    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); // generate random 5 digit number
            this.title = title;
            this.playCount = 0;
        }

        public void IncreasePlayCount(int count)
        {
            if (count < 0)
            {
                Console.WriteLine("Play count yang ditambahkan tidak boleh negatif.");
                return;
            }

            try
            {
```

```

        checked
        {
            playCount += count;
        }
    }
    catch (OverflowException)
    {
        Console.WriteLine("Jumlah play count melebihi batas maksimal.");
        playCount = int.MaxValue;
    }
}

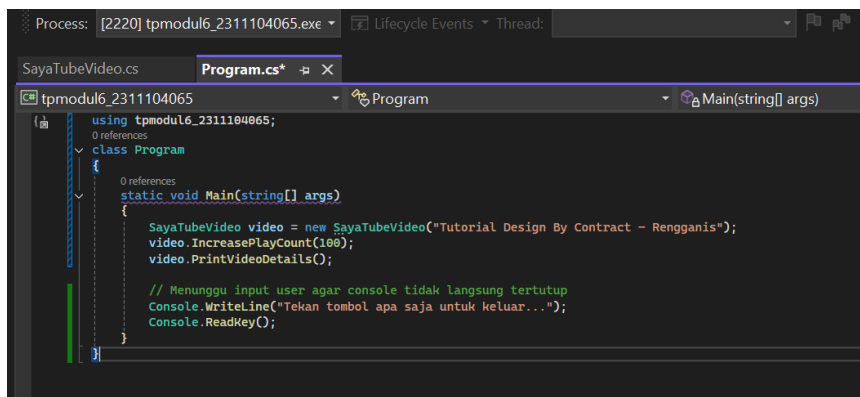
public void PrintVideoDetails()
{
    Console.WriteLine("Video ID: " + id);
    Console.WriteLine("Judul Video: " + title);
    Console.WriteLine("Jumlah Play: " + playCount);
    Console.WriteLine();
}
}
}

```

Penjelasan:

Kode C# ini mendefinisikan kelas `SayaTubeVideo` yang merepresentasikan sebuah video di platform mirip YouTube. Setiap objek video memiliki id unik (angka 5 digit acak), title (judul), dan playCount (jumlah tayang). Konstruktornya menginisialisasi id dan title, serta playCount ke nol. Metode `IncreasePlayCount` memungkinkan penambahan jumlah tayang, dengan validasi untuk mencegah nilai negatif dan penanganan `OverflowException` menggunakan `checked` untuk memastikan playCount tidak melebihi batas int maksimal. Terakhir, metode `PrintVideoDetails` berfungsi untuk menampilkan semua informasi detail video ke konsol.

- Program.cs



```

using tpmodule6_2311104065;

class Program
{
    static void Main(string[] args)
    {
        SayaTubeVideo video = new SayaTubeVideo("Tutorial Design By Contract - Rengganis");
        video.IncreasePlayCount(100);
        video.PrintVideoDetails();

        // Menunggu input user agar console tidak langsung tertutup
        Console.WriteLine("Tekan tombol apa saja untuk keluar...");
        Console.ReadKey();
    }
}

```

```

using tpmodul6_2311104065;
class Program
{
    static void Main(string[] args)
    {
        SayaTubeVideo video = new SayaTubeVideo("Tutorial Design By Contract – Rengganis");
        video.IncreasePlayCount(100);
        video.PrintVideoDetails();

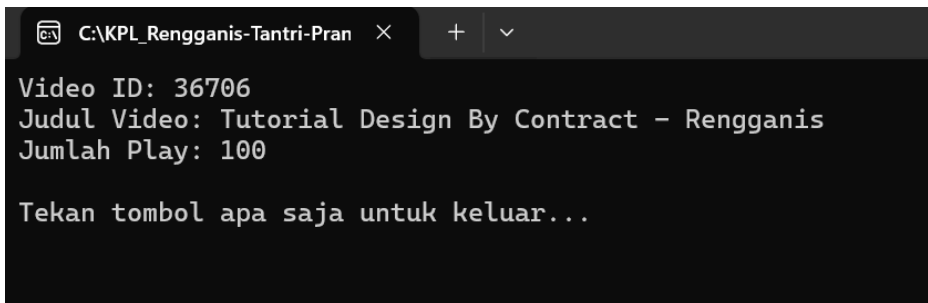
        // Menunggu input user agar console tidak langsung tertutup
        Console.WriteLine("Tekan tombol apa saja untuk keluar...");
        Console.ReadKey();
    }
}

```

Penjelasan:

Program C# ini berfungsi sebagai titik masuk utama aplikasi. Ia membuat sebuah objek SayaTubeVideo dengan judul "Tutorial Design By Contract – Rengganis". Selanjutnya, program meningkatkan playCount video tersebut sebanyak 100 dan kemudian memanggil metode PrintVideoDetails() untuk menampilkan semua informasi video (ID, judul, dan jumlah tayang) ke konsol. Terakhir, program akan menunggu input pengguna sebelum ditutup, agar hasil output bisa terlihat.

#### - Output



```

C:\KPL_Rengganis-Tantri-Pran
Video ID: 36706
Judul Video: Tutorial Design By Contract – Rengganis
Jumlah Play: 100

Tekan tombol apa saja untuk keluar...

```

#### 4. MELAKUKAN COMMIT KEDUA

```
C:\KPL_Rengganis-Tantri-Pramudita_2311104065_SE0702\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065>git add .
C:\KPL_Rengganis-Tantri-Pramudita_2311104065_SE0702\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065>git commit -m
"Menambahkan class SayaTubeVideo"
[main c40f3ad] Menambahkan class SayaTubeVideo
 31 files changed, 160 insertions(+), 10 deletions(-)
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\.\vs\tpmodul6_2311104065\FileContentIndex\42c8
f371-c9e7-4477-bacd-4d5ed53e4d54.vsidx
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\.\vs\tpmodul6_2311104065\FileContentIndex\66df
08dd-05e2-4ae9-b96e-3283ed70edbf.vsidx
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\.\vs\tpmodul6_2311104065\FileContentIndex\799c
7b60-7431-40e9-af47-7c630987f1f6.vsidx
 delete mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\.\vs\tpmodul6_2311104065\FileContentIndex\beac
db89-af23-4055-88ac-79a8bbae4fa7.vsidx
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\SayaTubeVideo.cs
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\bin\Debug\net8.0\tpmodul6
2311104065.deps.json
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\bin\Debug\net8.0\tpmodul6
2311104065.dll
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\bin\Debug\net8.0\tpmodul6
2311104065.exe
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\bin\Debug\net8.0\tpmodul6
2311104065.pdb
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\bin\Debug\net8.0\tpmodul6
2311104065.runtimeconfig.json
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\apphost.
exe
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\ref\tpmo
dul6_2311104065.dll
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\refint\t
pmodul6_2311104065.dll
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\tpmodul6
2311104065.csproj.BuildWithSkipAnalyzers
```

```
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\ref\tpmo
dul6_2311104065.dll
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\refint\t
pmodul6_2311104065.dll
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\tpmodul6
2311104065.csproj.BuildWithSkipAnalyzers
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\tpmodul6
2311104065.csproj.CoreCompileInputs.cache
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\tpmodul6
2311104065.csproj.FileListAbsolute.txt
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\tpmodul6
2311104065.dll
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\tpmodul6
2311104065.genruntimeconfig.cache
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\tpmodul6
2311104065.pdb
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\tpmodul6_2311104065\obj\Debug\net8.0\tpmodul6
2311104065.sourcelink.json

C:\KPL_Rengganis-Tantri-Pramudita_2311104065_SE0702\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065>git push -u o
rigin main
Enumerating objects: 66, done.
Counting objects: 100% (65/65), done.
Delta compression using up to 12 threads
Compressing objects: 100% (39/39), done.
Writing objects: 100% (44/44), 94.35 KiB | 1.75 MiB/s, done.
Total 44 (delta 10), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (10/10), completed with 8 local objects.
To https://github.com/rengganistan/KPL_Rengganis-Tantri-Pramudita_2311104065_SE0702.git
 fb91268..c40f3ad main -> main
branch 'main' set up to track 'origin/main'.

C:\KPL_Rengganis-Tantri-Pramudita_2311104065_SE0702\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065>
```

## 5. MENAMBAHKAN IMPLEMENTASI DESIGN BY CONTRACT

- SayaTubeVideo.cs

```
using System;
namespace tpmodul6_2311104065
{
    class SayaTubeVideo
    {
        private int id;
        private string title;
        private int playCount;

        public SayaTubeVideo(string title)
```

```

    {
        if (string.IsNullOrEmpty(title) || title.Length > 100)
        {
            throw new ArgumentException("Judul video tidak boleh null dan maksimal 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 < 0)
        {
            Console.WriteLine("Play count yang ditambahkan tidak boleh negatif.");
            return;
        }

        if (count > 10000000)
        {
            Console.WriteLine("Jumlah penambahan play count tidak boleh lebih dari 10.000.000.");
            return;
        }

        try
        {
            checked
            {
                playCount += count;
            }
        }
        catch (OverflowException)
        {
            Console.WriteLine("Jumlah play count melebihi batas maksimal.");
            playCount = int.MaxValue;
        }
    }

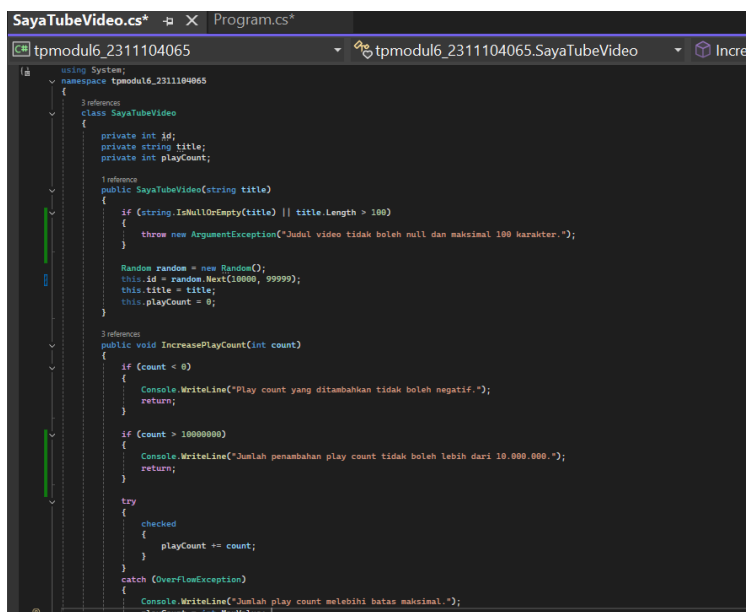
    public void PrintVideoDetails()
    {
        Console.WriteLine("Video ID: " + id);
        Console.WriteLine("Judul Video: " + title);
        Console.WriteLine("Jumlah Play: " + playCount);
        Console.WriteLine();
    }
}

```

```
}
```

Penjelasan:

Kode C# ini menyajikan kelas SayaTubeVideo yang disempurnakan. Kini, konstruktornya memiliki validasi ketat: ia akan melempar `ArgumentException` jika judul video kosong atau melebihi 100 karakter. Selain itu, metode `IncreasePlayCount` juga diperbarui dengan validasi tambahan untuk mencegah penambahan `playCount` negatif atau lebih dari 10.000.000, selain tetap menangani `OverflowException` jika `playCount` mencapai batas maksimum `int`. Kelas ini masih secara otomatis menghasilkan id unik dan menyediakan metode `PrintVideoDetails` untuk menampilkan detail video.



```
using System;
namespace tpmodule6_2311104065
{
    class SayaTubeVideo
    {
        private int id;
        private string title;
        private int playCount;

        public SayaTubeVideo(string title)
        {
            if (string.IsNullOrEmpty(title) || title.Length > 100)
            {
                throw new ArgumentException("Judul video tidak boleh null dan maksimal 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 < 0)
            {
                Console.WriteLine("Play count yang ditambahkan tidak boleh negatif.");
                return;
            }

            if (count > 10000000)
            {
                Console.WriteLine("Jumlah penambahan play count tidak boleh lebih dari 10.000.000.");
                return;
            }

            try
            {
                checked
                {
                    playCount += count;
                }
            }
            catch (OverflowException)
            {
                Console.WriteLine("Jumlah play count melebihi batas maksimal.");
                playCount = int.MaxValue;
            }
        }
    }
}
```

- Program.cs

```
using tpmodule6_2311104065;

class Program
{
    static void Main(string[] args)
    {
        try
        {
            SayaTubeVideo video = new SayaTubeVideo("Tutorial Design By Contract – Rengganis");

            for (int i = 0; i < 5; i++)
            {
                video.IncreasePlayCount(2000000);
            }
        }
    }
}
```



```

        video.IncreasePlayCount(15000000);

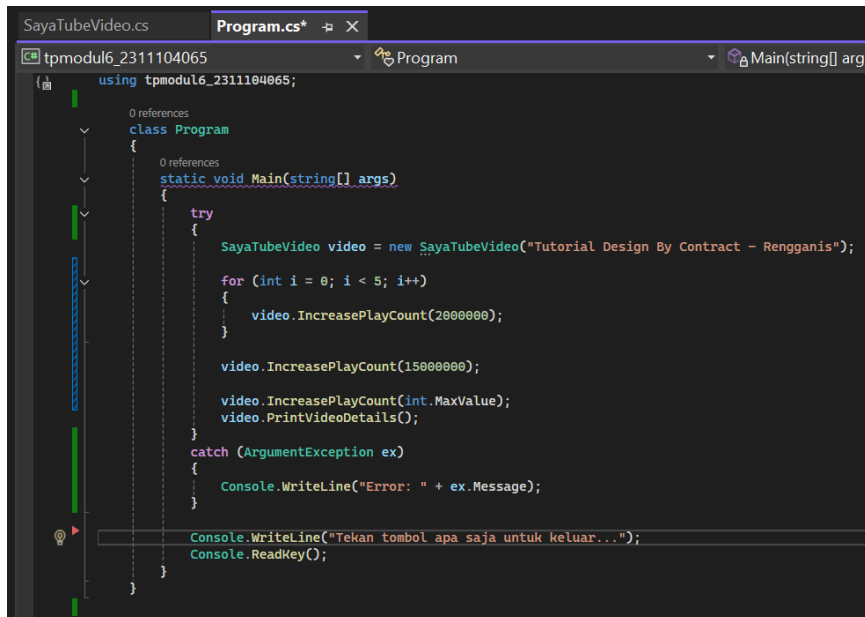
        video.IncreasePlayCount(int.MaxValue);
        video.PrintVideoDetails();
    }
    catch (ArgumentException ex)
    {
        Console.WriteLine("Error: " + ex.Message);
    }

    Console.WriteLine("Tekan tombol apa saja untuk keluar...");
    Console.ReadKey();
}
}

```

Penjelasan:

Program ini mendemonstrasikan penanganan *exception* pada kelas SayaTubeVideo yang sudah divalidasi ketat. Ia mencoba menambah *play count* video dengan nilai besar berkali-kali untuk memicu validasi dan *OverflowException* yang sudah diimplementasikan. Jika ada kesalahan pada judul video saat pembuatan objek, *ArgumentException* akan ditangkap dan pesannya ditampilkan, lalu program akan mencetak detail video dan menunggu input pengguna sebelum keluar.



```

SayaTubeVideo.cs
Program.cs*
using tpmodule6_2311104065;

class Program
{
    static void Main(string[] args)
    {
        try
        {
            SayaTubeVideo video = new SayaTubeVideo("Tutorial Design By Contract - Rengganis");

            for (int i = 0; i < 5; i++)
            {
                video.IncreasePlayCount(2000000);
            }

            video.IncreasePlayCount(15000000);

            video.IncreasePlayCount(int.MaxValue);
            video.PrintVideoDetails();
        }
        catch (ArgumentException ex)
        {
            Console.WriteLine("Error: " + ex.Message);
        }

        Console.WriteLine("Tekan tombol apa saja untuk keluar...");
        Console.ReadKey();
    }
}

```

- Output

```
C:\KPL_Rengganis-Tantri-Pran x + v
Jumlah penambahan play count tidak boleh lebih dari 10.000.000.
Jumlah penambahan play count tidak boleh lebih dari 10.000.000.
Video ID: 71303
Judul Video: Tutorial Design By Contract - Rengganis
Jumlah Play: 10000000

Tekan tombol apa saja untuk keluar...
```

## 6. MELAKUKAN COMMIT TERAKHIR

```
C:\KPL_Rengganis-Tantri-Pramudita_2311104065_SE0702\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065>git add .
C:\KPL_Rengganis-Tantri-Pramudita_2311104065_SE0702\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065>git commit -m
"implementasi desain by contract"
[main 332be75] implementasi desain by contract
 21 files changed, 54 insertions(+), 28 deletions(-)
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\.\vs\tpmodul6_2311104065\FileContentIndex\108d
6fe7-6729-48b4-846e-59d19836432b.vsix
 delete mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\.\vs\tpmodul6_2311104065\FileContentIndex\42c8
f371-c9e7-4d77-bacd-4d5ed53eidd54.vsix
 delete mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\.\vs\tpmodul6_2311104065\FileContentIndex\66df
08dd-05e2-4ae0-b96e-3283ed70edbf.vsix
 create mode 100644 06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065\.\vs\tpmodul6_2311104065\FileContentIndex\c982
dfbf-6bfa-4bd8-bbe6-3225183d7a3a.vsix
C:\KPL_Rengganis-Tantri-Pramudita_2311104065_SE0702\06_Design_by_Contract_dan_Defensive_Programming\tpmodul6_2311104065>git push
Enumerating objects: 56, done.
Counting objects: 100% (56/56), done.
Delta compression using up to 12 threads
Compressing objects: 100% (28/28), done.
Writing objects: 100% (31/31), 11.14 KiB | 760.00 KiB/s, done.
Total 31 (delta 16), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (16/16), completed with 15 local objects.
To https://github.com/rengganistan/KPL_Rengganis-Tantri-Pramudita_2311104065_SE0702.git
 c40f3ad..332be75  main -> main
```