



TUGAS JURNAL
KONSTRUKSI PERANGKAT LUNAK
MODUL 6

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

Dosen :
YIS

Prodi S1 Rekaya Perangkat Lunak
Direktorat Kampus Purwokerto

1. MELAKUKAN GIT COMMIT PADA PROJECT YANG DIBUAT (UP .gitignore)

```
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\tjmod6_2311104042>git branch
  generic-class
  generic-method
  implementasi-generic-class
  implementasi-generic-method
* main

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tjmod6_2311104042>git add tjmod6_2311104042

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tjmod6_2311104042>git commit -m "up .gitignore"
[main 349828a] up .gitignore
3 files changed, 412 insertions(+)
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tjmod6_2311104042/tjmod6_2311104042/.gitignore
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tjmod6_2311104042/tjmod6_2311104042/Program.cs
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tjmod6_2311104042/tjmod6_2311104042/tjmod6_2311104042.csproj

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tjmod6_2311104042>git push origin main
To https://github.com/tiurmagrace/KPL_TiurmaGraceA_2311104042_S1SE-07-02.git
 ! [rejected]        main -> main (fetch first)
error: failed to push some refs to 'https://github.com/tiurmagrace/KPL_TiurmaGraceA_2311104042_S1SE-07-02.git'
hint: Updates were rejected because the remote contains work that you do not
hint: have locally. This is usually caused by another repository pushing to
hint: the same ref. If you want to integrate the remote changes, use
hint: 'git pull' before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tjmod6_2311104042>git pull origin main --rebase
remote: Enumerating objects: 71, done.
remote: Counting objects: 100% (71/71), done.
remote: Compressing objects: 100% (60/60), done.
remote: Total 68 (delta 18), reused 1 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (68/68), 5.03 MiB | 2.59 MiB/s, done.
From https://github.com/tiurmagrace/KPL_TiurmaGraceA_2311104042_S1SE-07-02
* branch            main       -> FETCH_HEAD
00b073b..3c33b68  main       -> origin/main
```

2. MENAMBAHKAN KODE AWAL SAYATUBEVIDEO

Class SayaTubeUser.cs

```
using System;
using System.Collections.Generic;

public class SayaTubeUser
{
    private int id;
    private List<SayaTubeVideo> uploadedVideos;
    public string Username { get; private set; }

    public SayaTubeUser(string username)
    {
        Random random = new Random();
        this.id = random.Next(10000, 99999);
        this.Username = username;
        this.uploadedVideos = new List<SayaTubeVideo>();
    }

    public void AddVideo(SayaTubeVideo video)
    {
        this.uploadedVideos.Add(video);
    }
}
```

```

    public int GetTotalVideoPlayCount()
    {
        int total = 0;
        foreach (var video in uploadedVideos)
        {
            total += video.GetPlayCount();
        }
        return total;
    }

    public void PrintAllVideoPlaycount()
    {
        Console.WriteLine("User: " + this.Username);
        int i = 1;
        foreach (var video in uploadedVideos)
        {
            Console.WriteLine("Video " + i + " judul: " + video.GetTitle());
            i++;
        }
    }
}

```

Class 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    : " + this.id);
        Console.WriteLine("Judul Video  : " + this.title);
        Console.WriteLine("Jumlah Ditonton: " + this.playCount);
    }

    public int GetPlayCount()
    {
        return this.playCount;
    }

    public string GetTitle()
    {
        return this.title;
    }
}

```

Program.cs

```

using System;

class Program
{
    static void Main()
    {
        SayaTubeUser user = new SayaTubeUser("Tiurma");

        string[] judulFilm = {
            "Review Film Interstellar oleh Tiurma",
            "Review Film Inception oleh Tiurma",
            "Review Film Parasite oleh Tiurma",
            "Review Film Avatar oleh Tiurma",
            "Review Film Coco oleh Tiurma",
            "Review Film Up oleh Tiurma",
            "Review Film The Batman oleh Tiurma",
            "Review Film Joker oleh Tiurma",
            "Review Film La La Land oleh Tiurma",
            "Review Film Tenet oleh Tiurma"
        };

        foreach (string judul in judulFilm)

```

```

    {
        SayaTubeVideo video = new SayaTubeVideo(judul);
        user.AddVideo(video);
    }

    user.PrintAllVideoPlaycount();
    Console.WriteLine("Total View Count: " + user.GetTotalVideoPlayCount());
}
}

```

Output :

```

static void Main()
{
    SayaTubeUser user = new SayaTubeUser("Tiurma");

    string[] judulFilm = {
        "Review Film Interstellar oleh Tiurma",
        "Review Film Inception oleh Tiurma",
        "Review Film Parasite oleh Tiurma",
        "Review Film Avatar oleh Tiurma",
        "Review Film Coco oleh Tiurma",
        "Review Film Up oleh Tiurma",
        "Review Film The Batman oleh Tiurma",
        "Review Film Joker oleh Tiurma",
        "Review Film La La Land oleh Tiurma",
        "Review Film Tenet oleh Tiurma"
    };

    for (int i = 0; i < judulFilm.Length; i++)
    {
        user.AddVideo(judulFilm[i]);
    }

    user.PrintAllVideoPlaycount();
    Console.WriteLine("Total View Count: 0");
}

```

Microsoft Visual Studio Debug Console

```

User: Tiurma
Video 1 judul: Review Film Interstellar oleh Tiurma
Video 2 judul: Review Film Inception oleh Tiurma
Video 3 judul: Review Film Parasite oleh Tiurma
Video 4 judul: Review Film Avatar oleh Tiurma
Video 5 judul: Review Film Coco oleh Tiurma
Video 6 judul: Review Film Up oleh Tiurma
Video 7 judul: Review Film The Batman oleh Tiurma
Video 8 judul: Review Film Joker oleh Tiurma
Video 9 judul: Review Film La La Land oleh Tiurma
Video 10 judul: Review Film Tenet oleh Tiurma
Total View Count: 0
C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tjmod6_2311104042\tjmod6_2311104042\bin\Debug\net8.0\tjmod6_2311104042.exe (process 22124) exited with code 0 (0x0).
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .

```

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\tjmod6_2311104042>git add SayaTubeVideo.cs SayaTubeUser.cs
Program.cs
fatal: pathspec 'SayaTubeVideo.cs' did not match any files

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tjmod6_2311104042>cd tjmod6_2311104042

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tjmod6_2311104042\tjmod6_2311104042>git add SayaTubeVideo.cs
SayaTubeUser.cs Program.cs

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tjmod6_2311104042\tjmod6_2311104042>git commit -m "menambahkan dua class SayaTubeVideo dan SayaTubeUser"
[main d204e8b] menambahkan dua class SayaTubeVideo dan SayaTubeUser
3 files changed, 112 insertions(+), 2 deletions(-)
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tjmod6_2311104042/tjmod6_2311104042/SayaTubeUser.cs
create mode 100644 06_Design_by_Contract_dan_Defensive_Programming/tjmod6_2311104042/tjmod6_2311104042/SayaTubeVideo.cs
C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tjmod6_2311104042\tjmod6_2311104042>git push origin main
Enumerating objects: 12, done.
Counting objects: 100% (12/12), done.
Delta compression using up to 12 threads
Compressing objects: 100% (7/7), done.
Writing objects: 100% (8/8), 1.62 KiB | 276.00 KiB/s, done.
Total 8 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To https://github.com/tiurmaGraceA/KPL_TiurmaGraceA_2311104042_S1SE-07-02.git
57f042b..d204e8b main -> main

C:\Users\USER\source\repos\KPL_TiurmaGraceA_2311104042_S1SE-07-02\06_Design_by_Contract_dan_Defensive_Programming\tjmod6_2311104042\tjmod6_2311104042>
```

3. MENAMBAHKAN IMPLEMENTASI DESIGN BY CONTRACT

Class SayaTubeUser.cs

```
using System;
using System.Collections.Generic;
using System.Diagnostics;

public class SayaTubeUser
{
    private int id;
    private List<SayaTubeVideo> uploadedVideos;
    public string Username { get; private set; }

    public SayaTubeUser(string username)
    {
        Debug.Assert(username != null && username.Length <= 100, "Username tidak boleh null dan maksimal 100 karakter");

        Random random = new Random();
        this.id = random.Next(10000, 99999);
        this.Username = username;
        this.uploadedVideos = new List<SayaTubeVideo>();
    }

    public void AddVideo(SayaTubeVideo video)
    {
        Debug.Assert(video != null, "Video tidak boleh null");
        this.uploadedVideos.Add(video);
    }
}
```

```

    }

    public int GetTotalVideoPlayCount()
    {
        int total = 0;
        foreach (var video in uploadedVideos)
        {
            total += video.GetPlayCount();
        }
        return total;
    }

    public void PrintAllVideoPlaycount()
    {
        Console.WriteLine("User: " + this.Username);
        int i = 1;
        foreach (var video in uploadedVideos)
        {
            Console.WriteLine("Video " + i + " judul: " + video.GetTitle());
            i++;
        }
    }
}

```

Class SayaTubeVideo.cs

```

using System;
using System.Diagnostics;

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

    public SayaTubeVideo(string title)
    {
        Debug.Assert(title != null && title.Length <= 100, "Judul 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)
    {
        Debug.Assert(count >= 0 && count <= 10000000, "Penambahan play
count harus antara 0 dan 10.000.000");

        try
        {
            checked
            {
                this.playCount += count;
            }
        }
        catch (OverflowException)
        {
            Console.WriteLine("Overflow terjadi saat menambah play count.");
        }
    }

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

    public int GetPlayCount()
    {
        return this.playCount;
    }

    public string GetTitle()
    {
        return this.title;
    }
}

```

Program.cs


```

using System;

class Program
{
    static void Main()
    {
        SayaTubeUser user = new SayaTubeUser("Tiurma");

        string[] judulFilm = {
            "Review Film Interstellar oleh Tiurma",
            "Review Film Inception oleh Tiurma",
            "Review Film Parasite oleh Tiurma",
            "Review Film Avatar oleh Tiurma",
            "Review Film Coco oleh Tiurma",
            "Review Film Up oleh Tiurma",
            "Review Film The Batman oleh Tiurma",
            "Review Film Joker oleh Tiurma",
            "Review Film La La Land oleh Tiurma",
            "Review Film Tenet oleh Tiurma"
        };

        Random rnd = new Random();

        foreach (string judul in judulFilm)
        {
            SayaTubeVideo video = new SayaTubeVideo(judul);

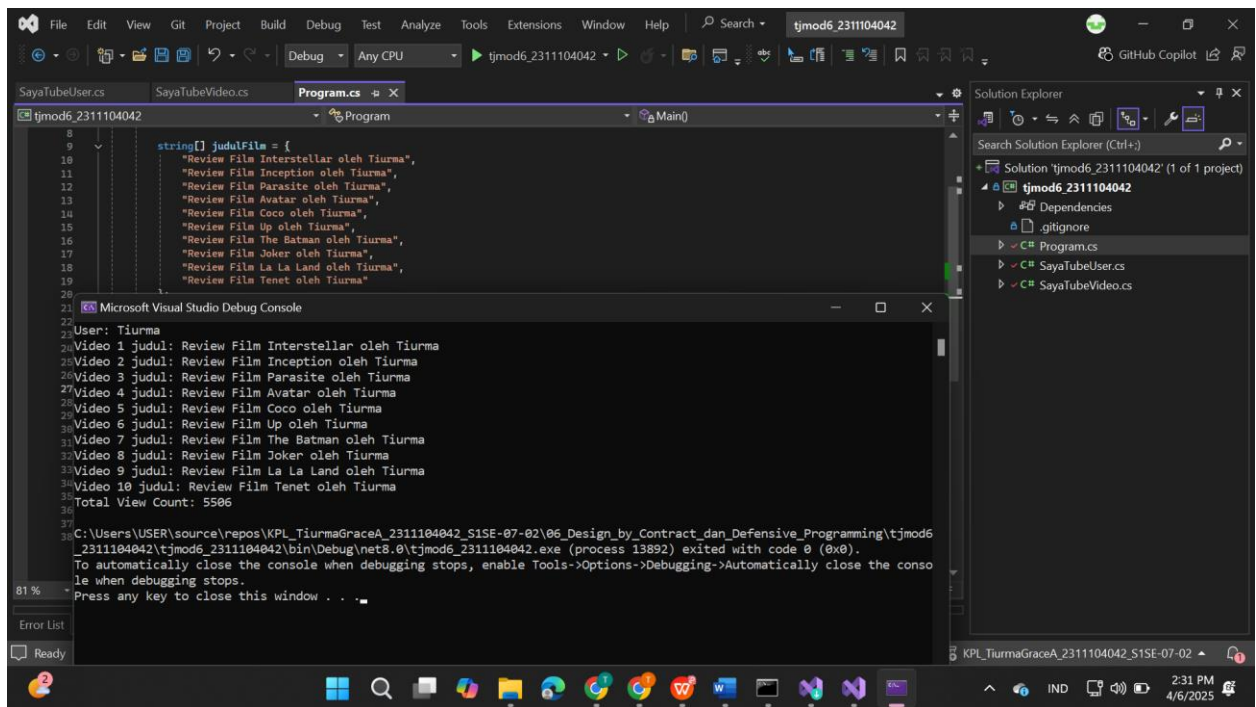
            int count = rnd.Next(100, 1001);
            video.IncreasePlayCount(count);

            user.AddVideo(video);
        }

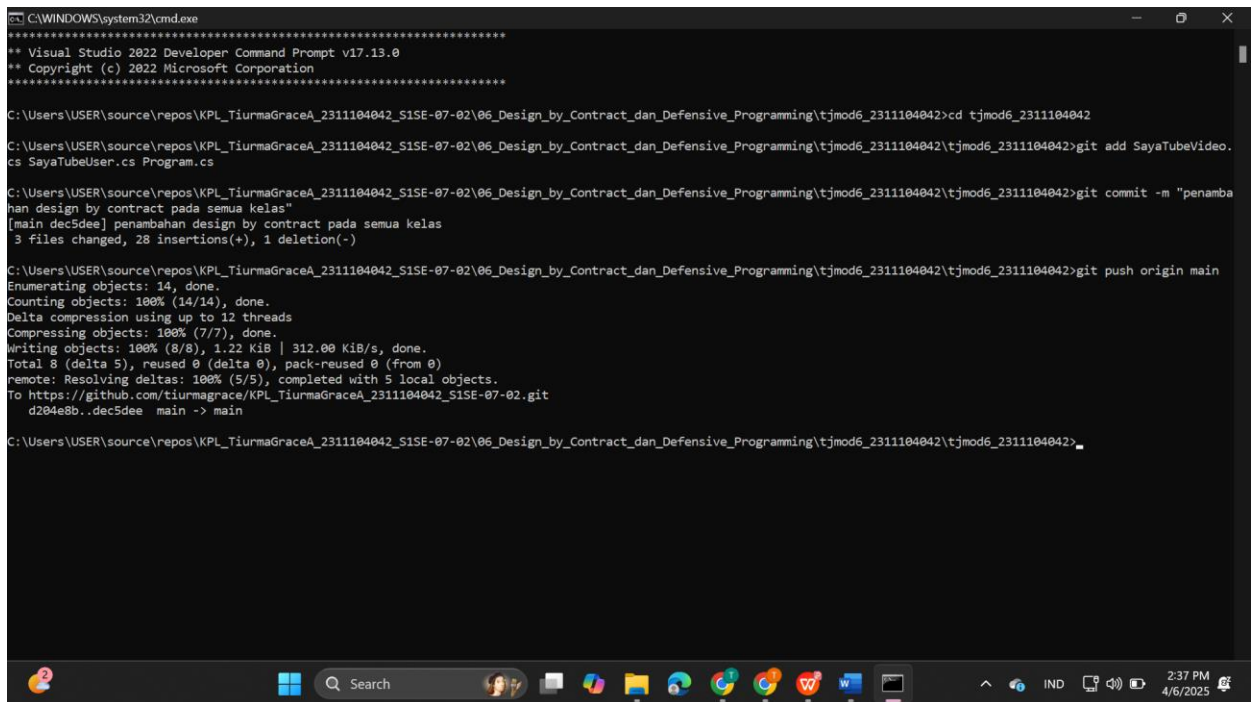
        user.PrintAllVideoPlaycount();
        Console.WriteLine("Total View Count: " + user.GetTotalVideoPlayCount());
    }
}

```

Output :



Commit :



Penjelasan Fungsi & Penerapan DbC (Design by Contract) :

1. SayaTubeVideo(string title)

Debug.Assert(title != null && title.Length <= 100);

DbC: Judul *wajib* tidak null & \leq 100 karakter.

- Tujuan: Mencegah objek video dibuat dengan data rusak.
- Sebelum DbC: Bisa bikin video dengan judul null atau terlalu panjang (error runtime).

2. IncreasePlayCount(int count)

Debug.Assert(count >= 0 && count <= 10000000);

DbC: Jumlah kenaikan playCount harus 0–10 juta.

- Tujuan: Menghindari input negatif/terlalu besar yang bisa merusak data.
- Selain itu ada:

```
try {  
    checked {  
        this.playCount += count;  
    }  
} catch (OverflowException) {  
    Console.WriteLine("Overflow terjadi");  
}
```

Ini bagian dari **defensive programming**, mengamankan operasi walau nilai tetap valid.

3. PrintVideoDetails()

Menampilkan detail video:

- ID
- Judul
- Jumlah ditonton

Tidak ada kontrak khusus, tapi bergantung pada data valid hasil kontrak dari constructor.

4. GetPlayCount() dan GetTitle()

Getter sederhana, mengembalikan nilai playCount dan title.

- Dipastikan selalu aman dipanggil karena sudah divalidasi di constructor (DbC).

5. SayaTubeUser(string username)

Debug.Assert(username != null && username.Length <= 100);

DbC: Username harus valid (tidak null dan \leq 100 karakter)

- Tujuan: Mencegah user dibuat dengan nama aneh atau tidak terbaca.

6. AddVideo(SayaTubeVideo video)

Debug.Assert(video != null);

DbC: Video yang ditambahkan ke user tidak boleh null.

- Tujuan: Hindari error saat menambahkan video ke list.

7. PrintAllVideoPlaycount()

Menampilkan semua video yang dimiliki user, sesuai urutan.

- Tidak ada kontrak spesifik, tapi datanya dipastikan valid lewat AddVideo().

8. GetTotalVideoPlayCount()

Menjumlahkan semua play count video milik user.

- Aman karena hanya menjumlahkan video yang telah tervalidasi sebelumnya.