

TP MODUL 5

GENERICS



Nama :

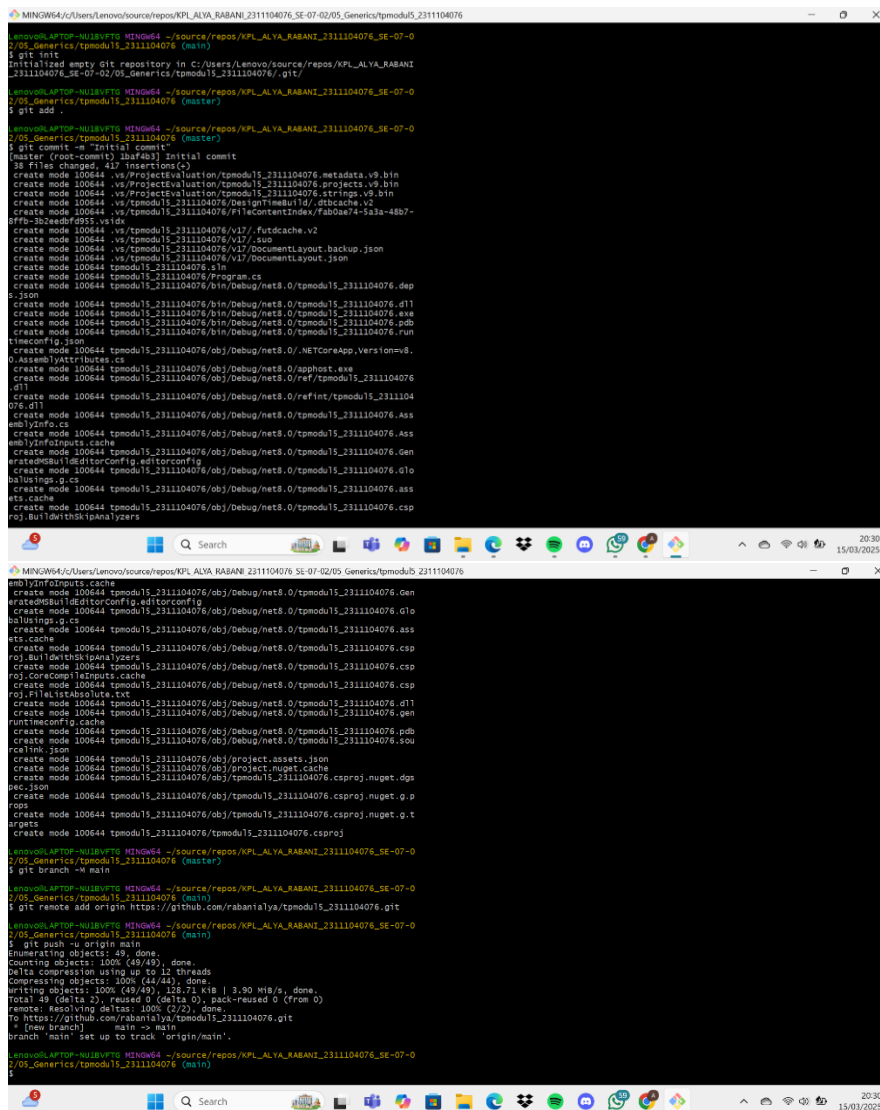
Alya Rabani (2311104076)

Dosen :

YUDHA ISLAMI SULISTYA

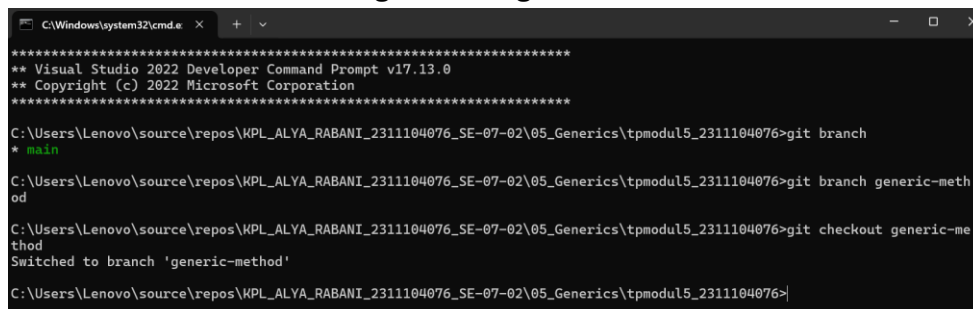
PROGRAM STUDI S1 REKAYASA PERANGKAT LUNAK
TELKOM UNIVERSITY PURWOKERTO
2025

1. Melakukan GIT commit pada project yang dibuat
Setelah membuat project console app disini kita membuat commit terlebih dahulu.



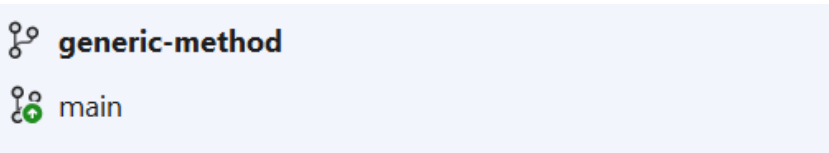
```
MINGW64/C:/Users/Lenovo/source/repos/KPL_ALYA_RABANI_2311104076_SE-07-02/05_Generics/tpmodul5_2311104076
C:\Users\Lenovo\source/repos/KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics>git init
Initialized empty Git repository in C:/Users/Lenovo/source/repos/KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics/tpmodul5_2311104076/.git/
C:\Users\Lenovo\source/repos/KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics>git add .
C:\Users\Lenovo\source/repos/KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics>git commit -m "Initial commit"
[master (root-commit) 1ba4fb3] Initial commit
38 files changed, 411 insertions(+)
create mode 100644 .vs/projectEvaluation/tpmodul5_2311104076.metadata.v9.bin
create mode 100644 .vs/projectEvaluation/tpmodul5_2311104076.projects.v9.bin
create mode 100644 .vs/projectEvaluation/tpmodul5_2311104076.strings.v9.bin
create mode 100644 .vs/tpmodul5_2311104076/DesignTimeResources/obj/cache.v2
create mode 100644 .vs/tpmodul5_2311104076/F1ContentIndex/FabBase4-3ala-48b7-8f8b-32aedbf955.vstx
create mode 100644 .vs/tpmodul5_2311104076/v17/.FutdCache.v2
create mode 100644 .vs/tpmodul5_2311104076/v17/.suo
create mode 100644 .vs/tpmodul5_2311104076/v17/DocumentLayout.backup.json
create mode 100644 .vs/tpmodul5_2311104076/v17/DocumentLayout.json
create mode 100644 tpmodul5_2311104076.sln
create mode 100644 tpmodul5_2311104076/Program.cs
create mode 100644 tpmodul5_2311104076/bin/Debug/net8.0/tpmodul5_2311104076.dep
s.json
create mode 100644 tpmodul5_2311104076/bin/Debug/net8.0/tpmodul5_2311104076.dll
create mode 100644 tpmodul5_2311104076/bin/Debug/net8.0/tpmodul5_2311104076.exe
create mode 100644 tpmodul5_2311104076/bin/Debug/net8.0/tpmodul5_2311104076.pdb
create mode 100644 tpmodul5_2311104076/bin/Debug/net8.0/tpmodul5_2311104076.run
timeconfig.json
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/.NETCoreApp,Version=v8.
0.AssemblyAttributes.cache
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/apphost.exe
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/ref/tpmodul5_2311104076
.dll
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/refint/tpmodul5_2311104
076.dll
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.Ass
emblyInfo.cs
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.Ass
emblyInfo.cache
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.den
tifiedEditorConfig.editorconfig
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.dlo
calized.g.cs
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.ass
ets.cache
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.csp
roj.BuiltWithSkiaAnalyzers
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.csp
roj.CoreCompileInputs.cache
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.csp
roj.FileListAbsolute.txt
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.dll
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.gen
runtimeconfig.cache
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.pdb
create mode 100644 tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.sou
rceLink.json
create mode 100644 tpmodul5_2311104076/obj/project.assets.json
create mode 100644 tpmodul5_2311104076/obj/project.nuget.cache
create mode 100644 tpmodul5_2311104076/obj/tpmodul5_2311104076.csproj.nuget.dps
pec.json
create mode 100644 tpmodul5_2311104076/obj/tpmodul5_2311104076.csproj.nuget.g.p
rops
create mode 100644 tpmodul5_2311104076/obj/tpmodul5_2311104076.csproj.nuget.g.t
argets
create mode 100644 tpmodul5_2311104076/tpmodul5_2311104076.csproj
C:\Users\Lenovo\source/repos/KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics>git branch -M main
C:\Users\Lenovo\source/repos/KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics>git push -u origin main
Enumerating objects: 49, done.
Counting objects: 100% (49/49), done.
Delta compression using up to 12 threads
Compressing objects: 100% (44/44), done.
Writing objects: 100% (49/49), 12.7 KiB | 3.30 MiB/s, done.
Total 49 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), done.
To https://github.com/rabaniya/tpmodul5_2311104076.git
+ [new branch] main -> main
branch 'main' set up to track 'origin/main'.
C:\Users\Lenovo\source/repos/KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics>git branch generic-method
```

2. Membuat branch baru pada GIT project
Setelah selesai membuat commit disini kita mengecek branch kemudian membuat branch baru dengan nama generic-method.



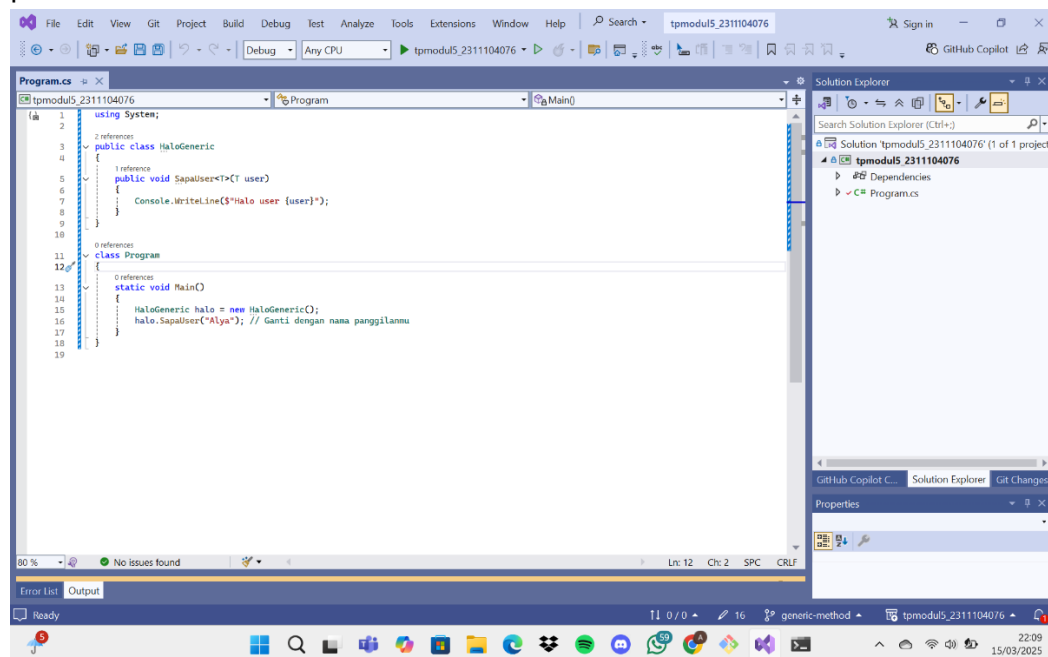
```
C:\Windows\system32\cmd.exe
** Visual Studio 2022 Developer Command Prompt v17.13.0
** Copyright (c) 2022 Microsoft Corporation
C:\Users\Lenovo\source/repos/KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics>git branch
* main
C:\Users\Lenovo\source/repos/KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics>git branch generic-method
C:\Users\Lenovo\source/repos/KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics>git checkout generic-method
Switched to branch 'generic-method'
C:\Users\Lenovo\source/repos/KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics>
```

Kalau misalnya branchnya sudah di tambahkan akan muncul dua branch seperti ini:

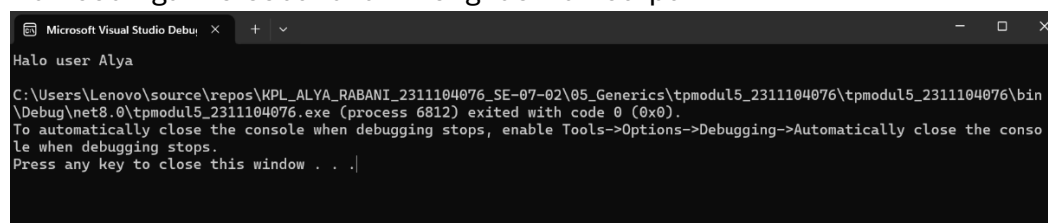


3. Menambahkan method dengan generic

Disini kita membuat class “HaloGeneric”. Lalu, tambahkan sebuah method dengan nama “SapaUser” yang memiliki generic parameter yang akan melakukan print “Halo user X” dimana X adalah input/nilai argument yang diberikan pada method tersebut. Kemudian, panggil method tersebut pada fungsi/method utama dengan input String dengan isi nilai nama panggilan praktikan.



Dari codingan tersebut akan menghasilkan output:



4. Melakukan commir, push, dan pindah ke branch

Jika misalnya sudah membuat codingannya dan berhasil setelah itu commit dulu kemudian push ke github pada branch “generic-method”.

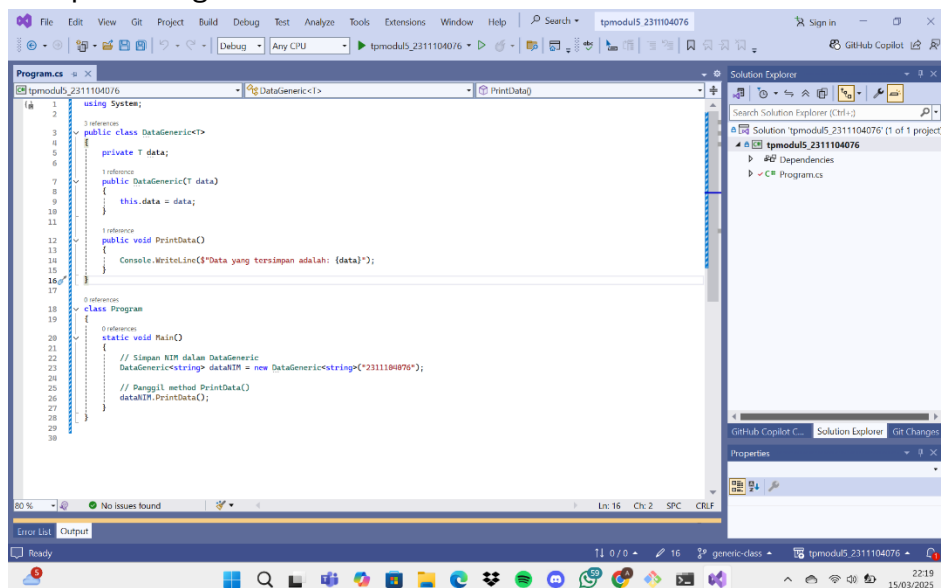
```
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git add .
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git commit -m "menambahkan class HaloGeneric dengan method"
[generic-method cf90fdc] menambahkan class HaloGeneric dengan method
18 files changed, 23 insertions(+), 7 deletions(-)
create mode 100644 .vs\tpmodul5_2311104076\FileContentIndex\24380ad2-8cdb-4bb1-9313-a95aa489ac56.vsixdx
delete mode 100644 .vs\tpmodul5_2311104076\FileContentIndex\fab0ae74-5a3a-48b7-8ffb-3b2eedbfd955.vsixdx
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git commit -m "Menambahkan class HaloGeneric dengan method SapaUser"
On branch generic-method
nothing to commit, working tree clean
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git push origin generic-method
Enumerating objects: 50, done.
Counting objects: 100% (49/49), done.
Delta compression using up to 12 threads
Compressing objects: 100% (24/24), done.
Writing objects: 100% (27/27), 7.95 KiB | 904.00 KiB/s, done.
Total 27 (delta 12), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (12/12), completed with 11 local objects.
remote:
remote: Create a pull request for 'generic-method' on GitHub by visiting:
remote:   https://github.com/rabania/tpmodul5_2311104076/pull/new/generic-method
remote:
To https://github.com/rabania/tpmodul5_2311104076.git
 * [new branch]      generic-method -> generic-method
```

Jika push telah berhasil, kita mengganti branch ke main lagi untuk membuat branch baru yaitu generic-class lalu pindah pada branch tersebut.

```
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git branch
* generic-method
main
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git switch main
Already on 'main'
Your branch is up to date with 'origin/main'.
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git branch generic-class
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git checkout generic-class
Switched to branch 'generic-class'
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>
```

5. Menambahkan method dengan generic

Disini kita membuat sebuah class bernama “DataGeneric” dengan mengikuti class model, class tersebut memiliki property “Data” yang bertipe generic “T” dan memiliki konstruktor dengan parameter data. Class tersebut juga memiliki method bernama PrintData yang melakukan print di console dengan output “Data yang tersimpan adalah: Y”, dengan “Y” adalah nilai dari property “data” dari kelas tersebut. Panggil method PrintData() setelah mengisi “data” dengan NIM pada fungsi/method utama.



Dari codingan ini akan menghasilkan output ini:

```
Microsoft Visual Studio Debu: X + v
Data yang tersimpan adalah: 2311104076
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076\tpmodul5_2311104076\bin
\Debug\net8.0\tpmodul5_2311104076.exe (process 3628) 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 . . .
```

6. Melakukan commit, push, dan pindah bagian 2

Disini kita melakukan commit dengan pesan “menambahkan class DataGeneric”. Jika berhasil push ke github pada branch “generic-class”. Setelah proses push berhasil, ganti branch yang aktif ke master/main branch

```
Lenovo@LAPTOP-NUIBVFTG MINGW64 ~/source/repos/KPL_ALYA_RABANI_2311104076_SE-07-0
2/05_Generics/tpmodul5_2311104076 (generic-class)
$ git add .

Lenovo@LAPTOP-NUIBVFTG MINGW64 ~/source/repos/KPL_ALYA_RABANI_2311104076_SE-07-0
2/05_Generics/tpmodul5_2311104076 (generic-class)
$ git commit -m "Menambahkan class data-generic"
[generic-class a8902af] Menambahkan class data-generic
12 files changed, 34 insertions(+), 5 deletions(-)

Lenovo@LAPTOP-NUIBVFTG MINGW64 ~/source/repos/KPL_ALYA_RABANI_2311104076_SE-07-0
2/05_Generics/tpmodul5_2311104076 (generic-class)
$ git push origin generic class
error: src refspec generic does not match any
error: src refspec class does not match any
error: failed to push some refs to 'https://github.com/rabania/alya/KPL_ALYA_RABAN
I_2311104076_SE-07-02.git'

Lenovo@LAPTOP-NUIBVFTG MINGW64 ~/source/repos/KPL_ALYA_RABANI_2311104076_SE-07-0
2/05_Generics/tpmodul5_2311104076 (generic-class)
$ git remote -v
origin https://github.com/rabania/alya/KPL_ALYA_RABANI_2311104076_SE-07-02.git (f
etch)
origin https://github.com/rabania/alya/KPL_ALYA_RABANI_2311104076_SE-07-02.git (p
ush)

Lenovo@LAPTOP-NUIBVFTG MINGW64 ~/source/repos/KPL_ALYA_RABANI_2311104076_SE-07-0
2/05_Generics/tpmodul5_2311104076 (generic-class)
$ ^C

Lenovo@LAPTOP-NUIBVFTG MINGW64 ~/source/repos/KPL_ALYA_RABANI_2311104076_SE-07-0
2/05_Generics/tpmodul5_2311104076 (generic-class)
$ git push origin generic-class
Enumerating objects: 56, done.
Counting objects: 100% (56/56), done.
Delta compression using up to 12 threads
Compressing objects: 100% (38/38), done.
Writing objects: 100% (47/47), 77.82 KiB | 3.71 MiB/s, done.
Total 47 (delta 17), reused 1 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (17/17), completed with 5 local objects.
remote:
remote: Create a pull request for 'generic-class' on GitHub by visiting:
remote: https://github.com/rabania/alya/KPL_ALYA_RABANI_2311104076_SE-07-02/p
ull/new/generic-class
remote:
To https://github.com/rabania/alya/KPL_ALYA_RABANI_2311104076_SE-07-02.git
 * [new branch] generic-class -> generic-class

Lenovo@LAPTOP-NUIBVFTG MINGW64 ~/source/repos/KPL_ALYA_RABANI_2311104076_SE-07-0
2/05_Generics/tpmodul5_2311104076 (generic-class)
$
```

7. Melakukan GIT merge dari kedua branch baru

Setelah melakukan push tadi pasti akan ada konflik yang terjadi, maka dari itu kita menggunakan merge untuk mengatasi konflik itu. Disini saya masuk lagi ke branch main kemudian saya mengpull branch tersebut.

```

C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git pull origin main
remote: Enumerating objects: 1, done.
remote: Counting objects: 100% (1/1), done.
remote: Total 1 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (1/1), 911 bytes | 227.00 KiB/s, done.
From https://github.com/rabania/tpmodul5_2311104076
* branch      main      -> FETCH_HEAD
  1baf4b3..b6ff4a7  main      -> origin/main
Updating 1baf4b3..b6ff4a7
Fast-forward
 .../24380ad2-8cdb-4bb1-9313-a95aa489ac56.vsidx | Bin 0 -> 4082 bytes
 .../fab0ae74-5a3a-48b7-8ffb-3b2eedbfd955.vsidx | Bin 3492 -> 0 bytes
 .vs/tpmodul5_2311104076/v17/.futcachecache.v2 | Bin 209 -> 209 bytes
 .vs/tpmodul5_2311104076/v17/.suo | Bin 25608 -> 28672 bytes
 .../v17/DocumentLayout.backup.json | 2 +-
 .vs/tpmodul5_2311104076/v17/DocumentLayout.json | 2 +-
 tpmodul5_2311104076/Program.cs | 20 ++++++
 .../bin/Debug/net8.0/tpmodul5_2311104076.dll | Bin 5120 -> 5632 bytes
 .../bin/Debug/net8.0/tpmodul5_2311104076.exe | Bin 139264 -> 139264 bytes
 .../bin/Debug/net8.0/tpmodul5_2311104076.pdb | Bin 11560 -> 10956 bytes
 tpmodul5_2311104076/obj/Debug/net8.0/apphost.exe | Bin 139264 -> 139264 bytes
 .../obj/Debug/net8.0/ref/tpmodul5_2311104076.dll | Bin 6144 -> 6144 bytes
 .../Debug/net8.0/refint/tpmodul5_2311104076.dll | Bin 6144 -> 6144 bytes
 .../net8.0/tpmodul5_2311104076.AssemblyInfo.cs | 2 +-
 .../tpmodul5_2311104076.AssemblyInfoInputs.cache | 2 +-
 .../obj/Debug/net8.0/tpmodul5_2311104076.dll | Bin 5120 -> 5632 bytes
 .../obj/Debug/net8.0/tpmodul5_2311104076.pdb | Bin 11560 -> 10956 bytes
 .../net8.0/tpmodul5_2311104076.sourcelink.json | 2 +-
18 files changed, 23 insertions(+), 7 deletions(-)
create mode 100644 .vs/tpmodul5_2311104076/FileContentIndex/24380ad2-8cdb-4bb1-9313-a95aa489ac56.vsidx
delete mode 100644 .vs/tpmodul5_2311104076/FileContentIndex/fab0ae74-5a3a-48b7-8ffb-3b2eedbfd955.vsidx

```

Disini ada beberapa file yang seharusnya tidak perlu di push jadi saya menambahkan file .gitignore agar kalau di push lagi tidak error. Kemudian saya push file .gitignore tadi.

```

Mode                LastWriteTime         Length Name
----                -
d-----          3/15/2025  10:40 PM                .git
d-----          3/15/2025  8:25 PM                .vs
d-----          3/15/2025  10:35 PM                tpmodul5_2311104076
-a-----          3/15/2025  10:38 PM                66 .gitignore
-a-----          3/15/2025  8:23 PM               1170 tpmodul5_2311104076.sln

PS C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076> git add .gitignore
PS C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076> git commit -m "Menambahkan file .gitignore"
J      .vs/tpmodul5_2311104076/v17/.futcachecache.v2
J      .vs/tpmodul5_2311104076/v17/.suo
J      .vs/tpmodul5_2311104076/v17/DocumentLayout.backup.json
J      .vs/tpmodul5_2311104076/v17/DocumentLayout.json
J      tpmodul5_2311104076/Program.cs
J      tpmodul5_2311104076/bin/Debug/net8.0/tpmodul5_2311104076.dll
J      tpmodul5_2311104076/bin/Debug/net8.0/tpmodul5_2311104076.pdb
J      tpmodul5_2311104076/obj/Debug/net8.0/ref/tpmodul5_2311104076.dll
J      tpmodul5_2311104076/obj/Debug/net8.0/refint/tpmodul5_2311104076.dll
J      tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.dll
J      tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.pdb
J      tpmodul5_2311104076/obj/Debug/net8.0/tpmodul5_2311104076.sourcelink.json
error: Committing is not possible because you have unmerged files.
hint: Fix them up in the work tree, and then use 'git add/rm <file>'
hint: as appropriate to mark resolution and make a commit.
fatal: Exiting because of an unresolved conflict.

PS C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>

```

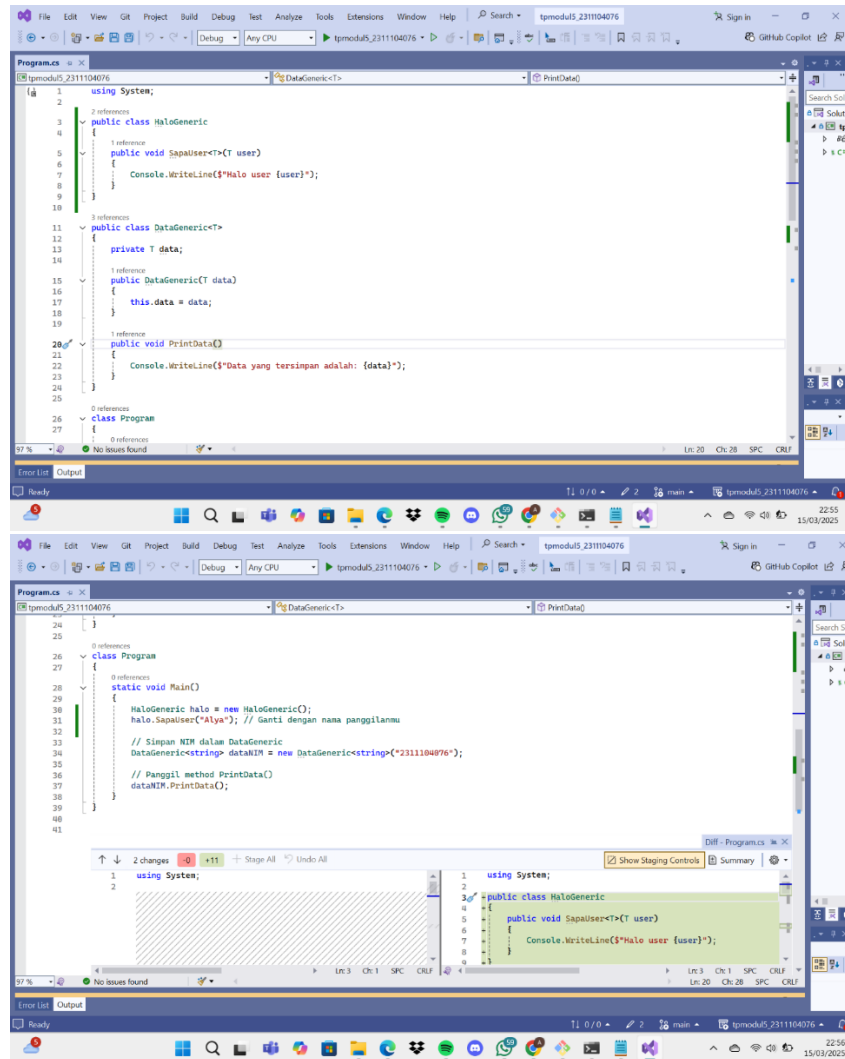
Pada saat saya membuka program.cs isinya menjadi begini, terlihat ada sisa merge conflict (<<<<<<< HEAD dan >>>>>>> generic-class). Kemudian saya melakukan perbaikan dengan membuka setiap file yang ada tanda <<<<<<< HEAD dan >>>>>>> generic-class, memilih versi kode yang benar dan menghapus semua tanda merge conflict (<<<<<<<, =====, dan >>>>>>>).

```

1 using System;
2
3 <<<<<<< HEAD
4 2 references
5 public class HaloGeneric
6 {
7     1 reference
8     public void SayHelloUser<T>(<T> user)
9     {
10         Console.WriteLine($"Halo user {user}");
11     }
12
13     =====
14     public class DataGeneric<T>
15     {
16         private T data;
17
18         public DataGeneric(T data)
19         {
20             this.data = data;
21         }
22
23         public void PrintData()
24         {
25             Console.WriteLine($"Data yang tersimpan adalah: {data}");
26         }
27     }
28
29 >>>>>>> generic-class
30 }

```

Setelah itu nanti akan jadi seperti ini, ini merupakan kode yang benar penggabungan dari kedua kode dari branch yang berbeda.



Kemudian kita melakukan commit ke github memberitahu bahwa konflik telah di perbaiki dan push.

```
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git add .
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git commit -m "Menyelesaikan konflik merge"
[main 054f579] Menyelesaikan konflik merge
C:\Users\Lenovo\source\repos\KPL_ALYA_RABANI_2311104076_SE-07-02\05_Generics\tpmodul5_2311104076>git push origin main
Enumerating objects: 70, done.
Counting objects: 100% (66/66), done.
Delta compression using up to 12 threads
Compressing objects: 100% (23/23), done.
Writing objects: 100% (26/26), 6.20 KiB | 1.03 MiB/s, done.
Total 26 (delta 15), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (15/15), completed with 14 local objects.
To https://github.com/rabaniahya/tpmodul5_2311104076.git
b6ff4a7..054f579 main -> main
```