

**TUGAS PENDAHULUAN
KONSTRUKSI PERANGKAT LUNAK**

API DESIGN DAN CONSTRUCTION USING SWAGGER

Modul 9



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PROGRAM STUDI S1 SOFTWARE ENGINEERING

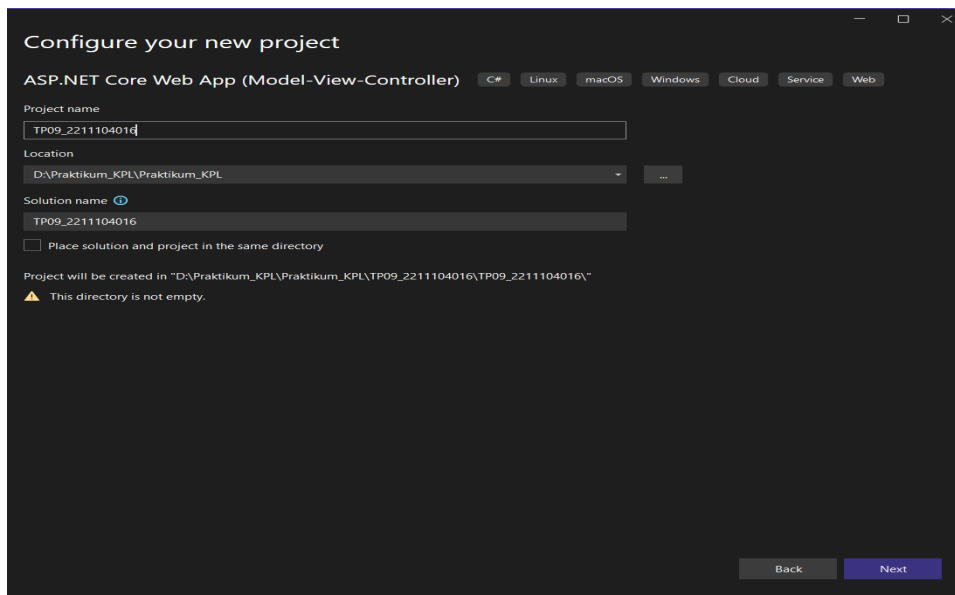
FAKULTAS INFORMATIKA

TELKOM UNIVERSITY PURWOKERTO

2025

1. MEMBUAT PROJECT WEB API

- Membuat Project dengan TP09_Nim



2. MELAKUKAN GIT COMMIT PADA PROJECT

- Melakukan Commit

```
Idham@LAPTOP-9DA4K8Q8 MINGW64 /d/Khusus Praktikum/TP09_2211104016 (main)
$ git add .

Idham@LAPTOP-9DA4K8Q8 MINGW64 /d/Khusus Praktikum/TP09_2211104016 (main)
$ git commit -m "Membuat Project Baru"
[main (root-commit) 0fee497] Membuat Project Baru
 26 files changed, 1821 insertions(+)
 create mode 100644 .vs/ProjectEvaluation/tp09_2211104016.metadata.v9.bin
 create mode 100644 .vs/ProjectEvaluation/tp09_2211104016.projects.v9.bin
 create mode 100644 .vs/ProjectEvaluation/tp09_2211104016.strings.v9.bin
 create mode 100644 .vs/TP09_2211104016/DesignTimeBuild/.dtbcache.v2
 create mode 100644 .vs/TP09_2211104016/FileContentIndex/2595beb3-b7fa-49c0-bb64-f9d217b6f7eb.vsidx
 create mode 100644 .vs/TP09_2211104016/FileContentIndex/6524ced0-389f-472f-b0bb-a7f0058da972.vsidx
 create mode 100644 .vs/TP09_2211104016/FileContentIndex/66c1231d-8051-4123-9594-c731006fdef4.vsidx
 create mode 100644 .vs/TP09_2211104016/FileContentIndex/74358a8e-4b73-4385-be98-a11b2cb2f841.vsidx
 create mode 100644 .vs/TP09_2211104016/FileContentIndex/da7fdfd1-27d0-4c83-a5fe-f0cd7c74804d.vsidx
```

- Melakukan push ke repo

```
Idham@LAPTOP-9DA4K8Q8 MINGW64 /d/Khusus Praktikum/TP09_2211104016 (laprak)
$ git push -u origin laprak
Enumerating objects: 37, done.
Counting objects: 100% (37/37), done.
Delta compression using up to 4 threads
Compressing objects: 100% (34/34), done.
Writing objects: 100% (37/37), 113.70 KiB | 2.37 MiB/s, done.
Total 37 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), done.
remote:
remote: Create a pull request for 'laprak' on GitHub by visiting:
remote:   https://github.com/Ridham2345/Praktikum_KPL/pull/new/laprak
remote:
To https://github.com/Ridham2345/Praktikum_KPL.git
 * [new branch]      laprak -> laprak
branch 'laprak' set up to track 'origin/laprak'.
```

3. IMPLEMENTASI WEB API

- Membuat Mahasiswa.cs pada folder Modul

```
namespace TP09_2211104016.Models
{
    7 references
    public class Mahasiswa
    {
        3 references
        public string? Nama { get; set; }
        3 references
        public string? Nim { get; set; }
    }
}
```

- Membuat MahasiswaController.cs di folder Controllers

```
TP09_2211104016 tpmodul9_2211104016
1
2 using Microsoft.AspNetCore.Mvc;
3 using System.Collections.Generic;
4 using TP09_2211104016.Models;
5
6 namespace tpmodul9_2211104016.Controllers
7 {
8     [ApiController]
9     [Route("api/[controller]")]
10    0 references
11    public class MahasiswaController : ControllerBase
12    {
13        private static List<Mahasiswa> mahasiswaList = new List<Mahasiswa>
14        //private static List<Mahasiswa> data = new List<Mahasiswa>
15        {
16            new Mahasiswa { Nama = "Muhammad Idham Cholid", Nim = "2211104016" },
17            new Mahasiswa { Nama = "Aufa", Nim = "1302000002" },
18            new Mahasiswa { Nama = "Edgar", Nim = "1234567890" },
19            new Mahasiswa { Nama = "Alam", Nim = "1234567890" }
20        };
21
22        [HttpGet]
23        0 references
24        public ActionResult<IEnumerable<Mahasiswa>> GetAll()
25        {
26            return mahasiswaList;
27        }
28
29        [HttpGet("{index}")]
30        0 references
31        public ActionResult<Mahasiswa> GetByIndex(int index)
32        {
33            if (index < 0 || index >= mahasiswaList.Count)
34                return NotFound("Index tidak ditemukan.");
35
36            return mahasiswaList[index];
37        }
38
39        [HttpPost]
40        0 references
41        public ActionResult AddMahasiswa([FromBody] Mahasiswa mhs)
42        {
43            mahasiswaList.Add(mhs);
44            return Ok("Mahasiswa berhasil ditambahkan.");
45        }
46
47        [HttpDelete("{index}")]
48        0 references
49        public ActionResult DeleteMahasiswa(int index)
50        {
51            if (index < 0 || index >= mahasiswaList.Count)
52                return NotFound("Index tidak ditemukan.");
53
54            mahasiswaList.RemoveAt(index);
55            return Ok("Mahasiswa berhasil dihapus.");
56        }
57    }
58 }
```

- **Program.cs**

```
TP09_2211104016
1 var builder = WebApplication.CreateBuilder(args);
2
3 // Add services to the container.
4
5 builder.Services.AddControllers();
6 // Learn more about configuring Swagger/OpenAPI at https://aka.ms/aspnetcore/swashbuckle
7 builder.Services.AddEndpointsApiExplorer();
8 builder.Services.AddSwaggerGen();
9
10 var app = builder.Build();
11
12 // Configure the HTTP request pipeline.
13 if (app.Environment.IsDevelopment())
14 {
15     app.UseSwagger();
16     app.UseSwaggerUI();
17 }
18
19 app.UseHttpsRedirection();
20
21 app.UseAuthorization();
22
23 app.MapControllers();
24
25 app.Run();
26
```

- **Hasil Running**

Swagger
powered by SMARTBEAR

Select a definition TP09_2211104016 v1

TP09_2211104016 1.0 OAS 3.0
<http://localhost:5211/swagger/v1/swagger.json>

Mahasiswa ^

- GET /api/Mahasiswa
- POST /api/Mahasiswa
- GET /api/Mahasiswa/{index}
- DELETE /api/Mahasiswa/{index}

WeatherForecast ^

- GET /WeatherForecast

4. MENDEMONSTRASI WEB API

- GET /api/mahasiswa untuk mengeluarkan list nama mahasiswa,nim

Curl

```
curl -X 'GET' \
  'http://localhost:5211/api/Mahasiswa' \
  -H 'accept: text/plain'
```

Request URL

http://localhost:5211/api/Mahasiswa

Server response

Code Details

200

Response body

```
{
  {
    "nama": "Muhammad Idham Cholid",
    "nim": "2211104016"
  },
  {
    "nama": "Aufa",
    "nim": "1302000002"
  },
  {
    "nama": "Edgar",
    "nim": "1234567890"
  },
  {
    "nama": "Alan",
    "nim": "1234567890"
  }
}
```

Response headers

```
content-type: application/json; charset=utf-8
date: Thu, 24 Apr 2025 17:03:26 GMT
server: Kestrel
transfer-encoding: chunked
```

- POST /api/mahasiswa → tambahkan mahasiswa baru.

```
curl -X 'POST' \
  'http://localhost:5211/api/Mahasiswa' \
  -H 'accept: */*' \
  -H 'Content-Type: application/json' \
  -d '{
    "nama": "Jhon",
    "nim": "1302199999"
  }'
```

Request URL

http://localhost:5211/api/Mahasiswa

Server response

Code Details

200

Response body

Mahasiswa berhasil ditambahkan.

Response headers

```
content-type: text/plain; charset=utf-8
date: Thu, 24 Apr 2025 17:21:00 GMT
server: Kestrel
transfer-encoding: chunked
```

- **Mencoba Get/Api/Mahasiswa**

```
Curl
curl -X 'GET' \
  'http://localhost:5211/api/mahasiswa' \
  -H 'accept: text/plain'

Request URL
http://localhost:5211/api/mahasiswa

Server response

Code    Details

200
Response body
[
  {
    "nama": "Muhammad Idham Cholid",
    "nim": "2211104016"
  },
  {
    "nama": "Aufa",
    "nim": "1303000002"
  },
  {
    "nama": "Edgar",
    "nim": "1234567890"
  },
  {
    "nama": "Alan",
    "nim": "1234567890"
  },
  {
    "nama": "string",
    "nim": "string"
  },
  {
    "nama": "Jhon",
    "nim": "1302150009"
  }
]

Response headers
content-type: application/json; charset=utf-8
date: Thu, 24 Apr 2025 17:00:21 GMT
server: Kestrel
transfer-encoding: chunked
```

- **Mencoba meminta mahasiswa dengan index 0, “GET /api/mahasiswa**

```
Curl
curl -X 'GET' \
  'http://localhost:5211/api/mahasiswa/0' \
  -H 'accept: text/plain'

Request URL
http://localhost:5211/api/mahasiswa/0

Server response

Code    Details

200
Response body
{
  "nama": "Muhammad Idham Cholid",
  "nim": "2211104016"
}

Response headers
content-type: application/json; charset=utf-8
date: Thu, 24 Apr 2025 17:22:27 GMT
server: Kestrel
transfer-encoding: chunked
```

- Menghapus objek mahasiswa dengan index ke-0 dengan “DELETE /api/mahasiswa/0”

Curl

```
curl -X 'DELETE' \
  'http://localhost:5211/api/mahasiswa/0' \
  -H 'accept: */*'
```

Request URL

http://localhost:5211/api/mahasiswa/0

Server response

Code	Details
200	<p>Response body</p> <p>Mahasiswa berhasil dihapus.</p> <p>Response headers</p> <p>content-type: text/plain; charset=utf-8 date: Thu, 24 Apr 2025 17:23:27 GMT server: Kestrel transfer-encoding: chunked</p>

- Cek list/array dari semua mahasiswa sekali lagi dengan “GET /api/mahasiswa”, pastikan nama anda sudah tidak muncul

Curl

```
curl -X 'GET' \
  'http://localhost:5211/api/mahasiswa' \
  -H 'accept: text/plain'
```

Request URL

http://localhost:5211/api/mahasiswa

Server response

Code	Details
200	<p>Response body</p> <pre>[{ "nama": "Aurfa", "nim": "1302000002" }, { "nama": "Edgar", "nim": "1234567890" }, { "nama": "Alan", "nim": "1234567890" }, { "nama": "Jhon", "nim": "1302199999" }]</pre> <p>Response headers</p> <p>content-type: application/json; charset=utf-8 date: Thu, 24 Apr 2025 17:24:25 GMT server: Kestrel transfer-encoding: chunked</p>

5. MELAKUKAN COMMIT

Melakukan Comnit dan Push

```
Idham@LAPTOP-9DA4K8Q8 MINGW64 /d/Khusus Praktikum/TP09_2211104016 (laprak)
$ git add .

Idham@LAPTOP-9DA4K8Q8 MINGW64 /d/Khusus Praktikum/TP09_2211104016 (laprak)
$ git commit -m "Menambahkan Api Mahasiswa"
[laprak 6885217] Menambahkan Api Mahasiswa
 7 files changed, 76 insertions(+), 39 deletions(-)
 delete mode 100644 .vs/TP09_2211104016/FileContentIndex/6524ced0-389f-472f-b0bb
-a7f0058da972.vsidx
 create mode 100644 .vs/TP09_2211104016/FileContentIndex/9f2c7c05-261c-4319-991d
-c369d788041c.vsidx

Idham@LAPTOP-9DA4K8Q8 MINGW64 /d/Khusus Praktikum/TP09_2211104016 (laprak)
$ git push -u origin laprak
Enumerating objects: 26, done.
Counting objects: 100% (26/26), done.
Delta compression using up to 4 threads
Compressing objects: 100% (14/14), done.
Writing objects: 100% (14/14), 10.99 KiB | 1.22 MiB/s, done.
Total 14 (delta 8), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (8/8), completed with 7 local objects.
To https://github.com/Ridham2345/Praktikum_KPL.git
 0fee497..6885217  laprak -> laprak
branch 'laprak' set up to track 'origin/laprak'.
```