Student Management System – User Guide

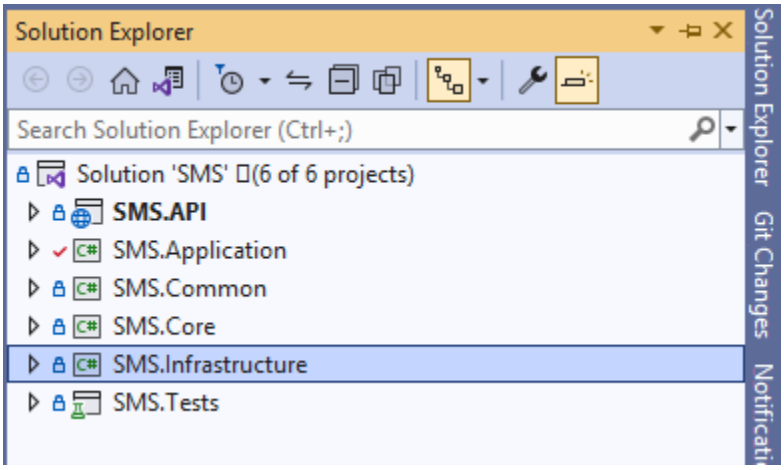
Backend: Dot Net Core – Web API – Entity Framework Code First Approach – Clear Architecture

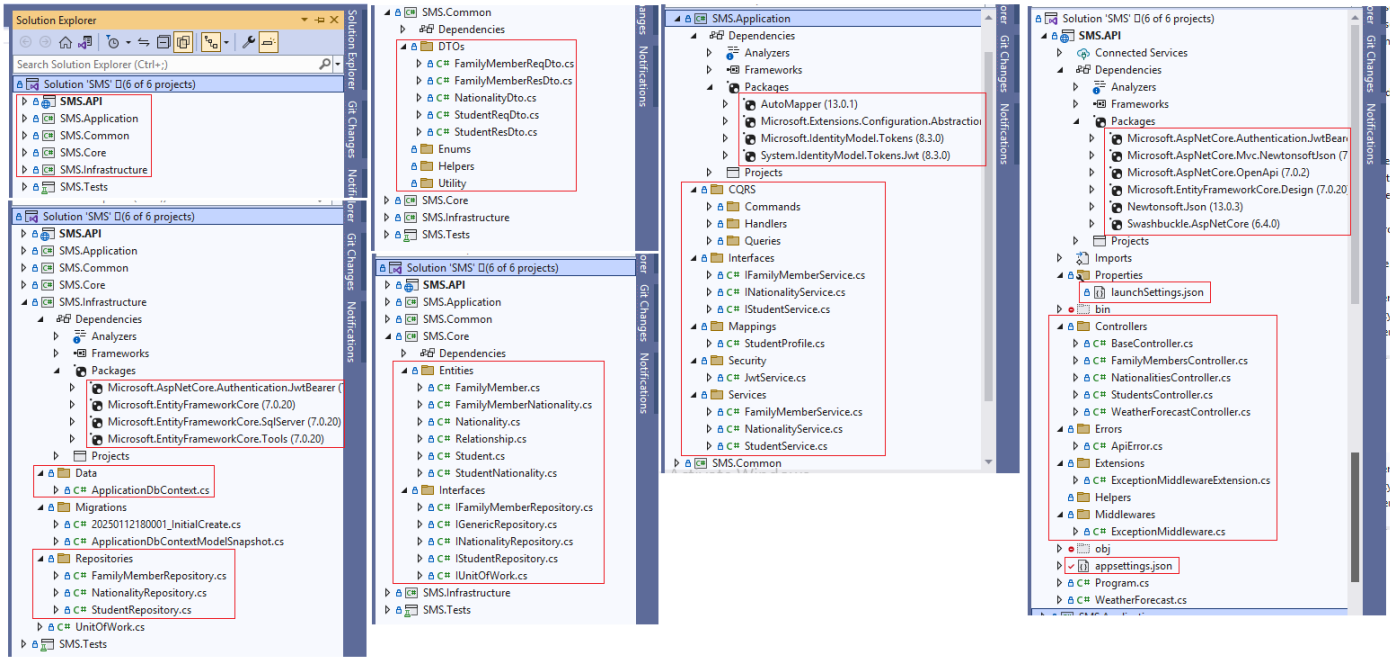
Projects – Core, Infrastructure, Application, Common, API, Tests

GitHub -.Net Core Backend Link: https://github.com/SheikGH/SMS_Asp.NetCore_WebAPI_Backend.git

Site Url : **http://localhost:5071/swagger/index.html**

Folder Structure: Clear Architecture - Core, Infrastructure, Application, Common, API, Tests

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SMS.Core
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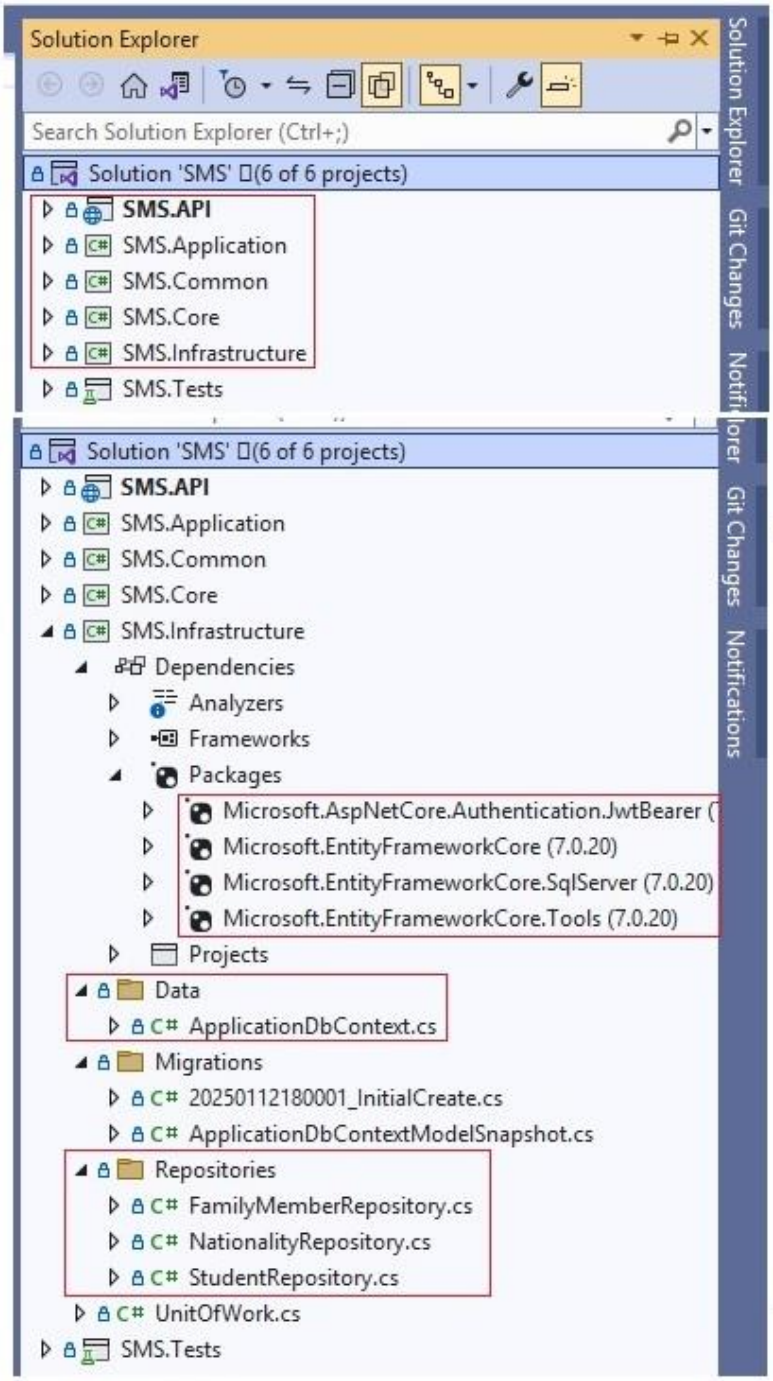
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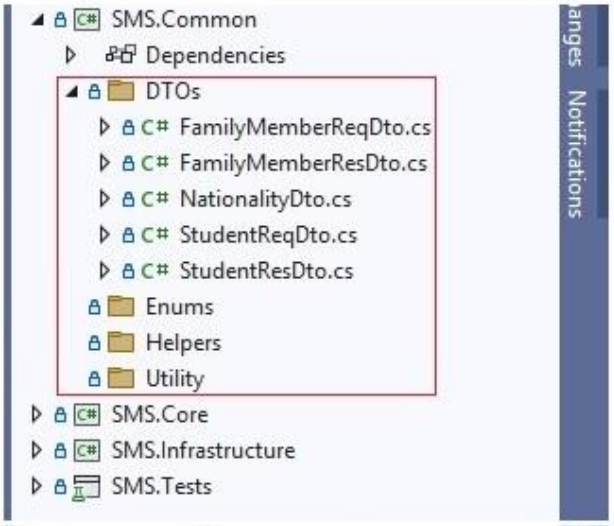
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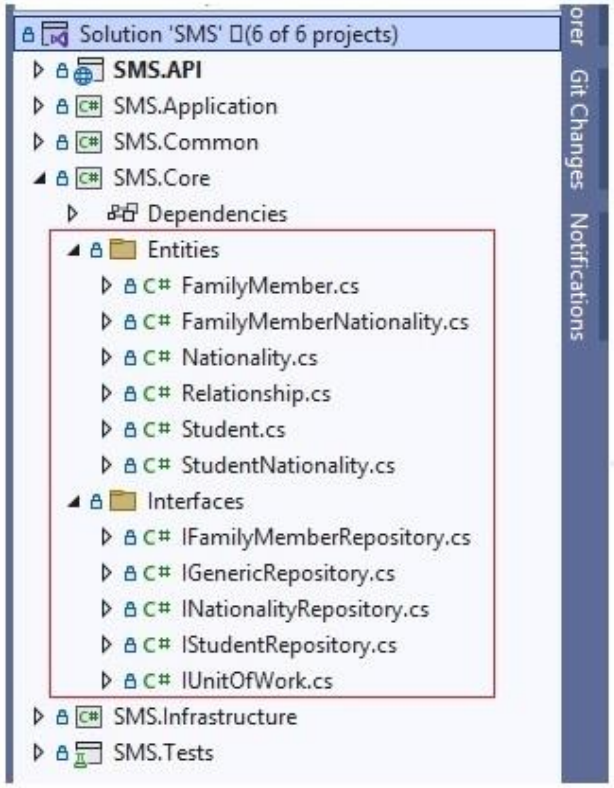
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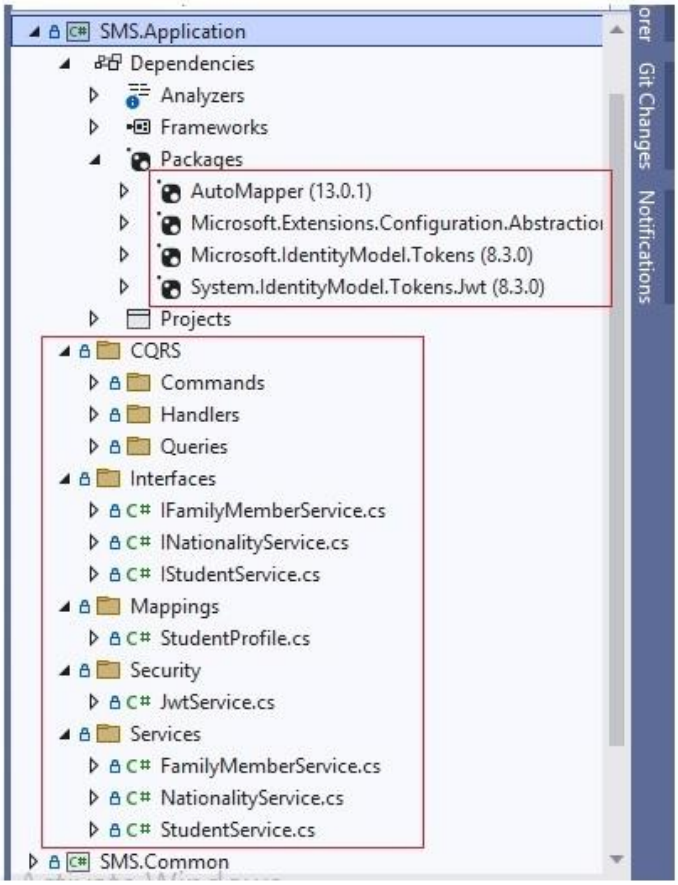

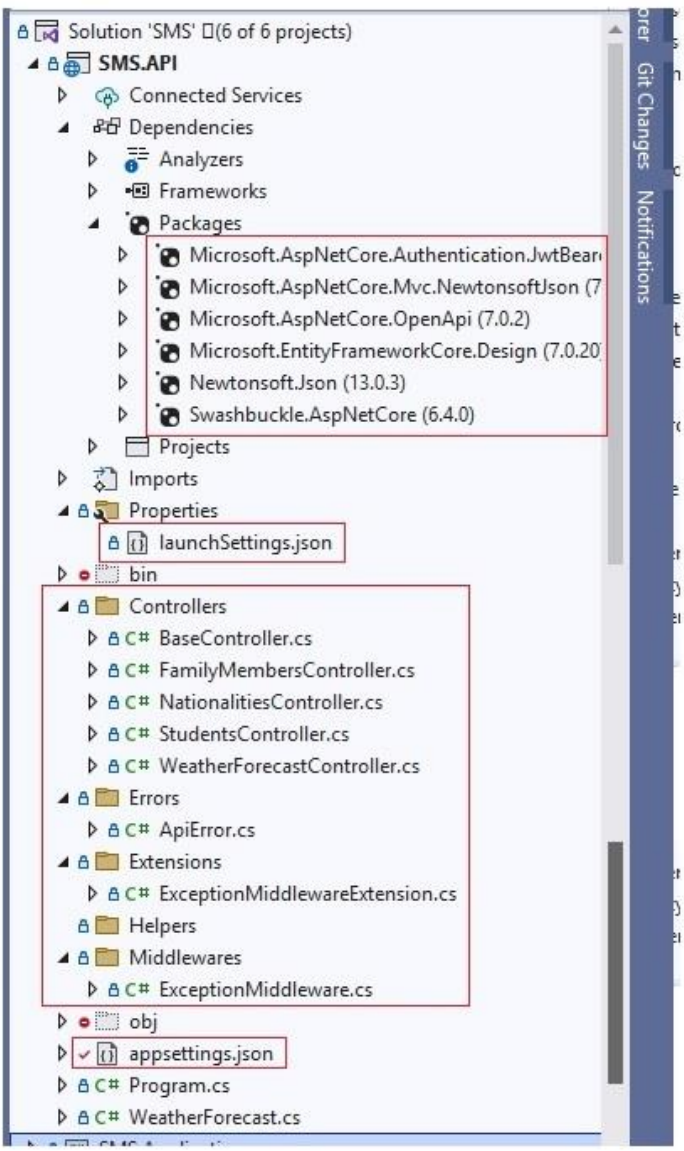

✅ Prerequisites

Ensure the following are installed on your machine:

- .NET SDK 6.0 or later
- SQL Server
- Visual Studio 2022+ (or Visual Studio Code + C# Extensions)
- Git
- EF Core CLI Tools (included in .NET SDK)

🔁 1. Clone the Backend Repository

```
git clone https://github.com/SheikGH/SMS_Asp.NetCore_WebAPI_Backend.git
```

Navigate into the project folder:

```
cd SMS_Asp.NetCore_WebAPI_Backend
```

⚙️ 2. Open the Project

Open the solution in **Visual Studio** (`SMS.sln`) or open the folder in **VS Code**.

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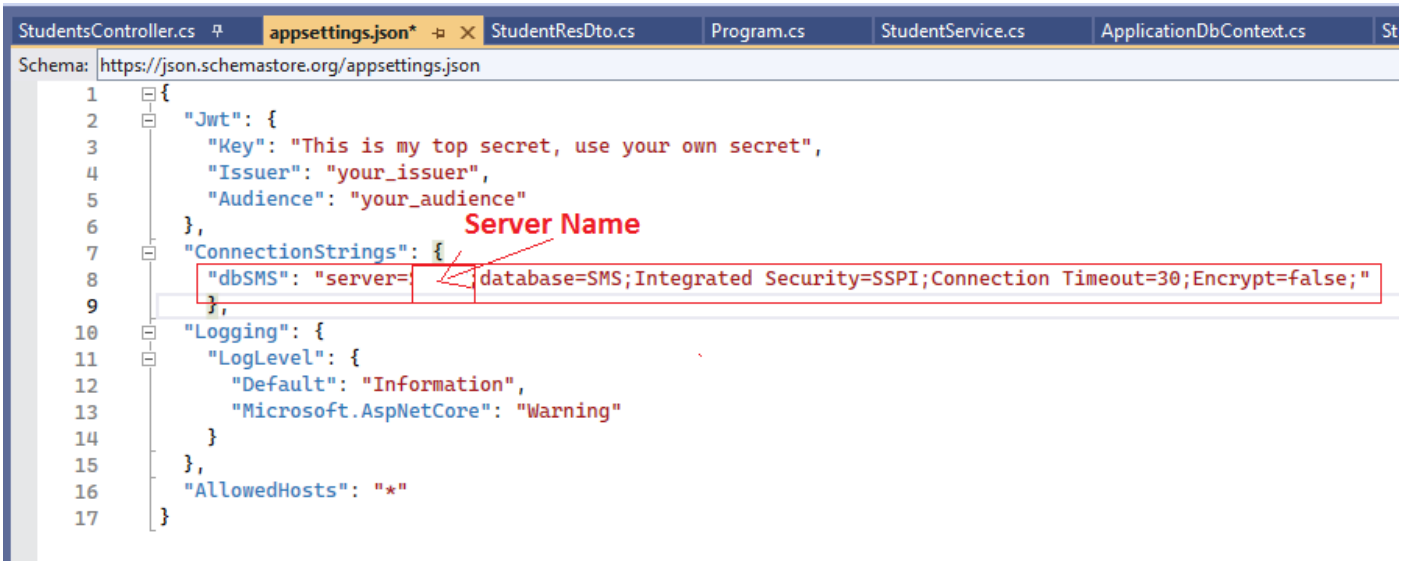
3. Configure the Database Connection

Open `appsettings.json` in the `SMS.API` project and **update your SQL Server connection string**:

```
"ConnectionStrings": {
  "DefaultConnection":
"Server=localhost;Database=SMS_DB;Trusted_Connection=True;MultipleActiveResultSets=true
"
}
```

Make sure the database name `SMS_DB` and SQL Server instance (e.g., `localhost`, `.\SQLEXPRESS`) match your setup.

Set up database details in the appsettings.json



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4. Run EF Core Migration and Update Database

Make sure **SMS.API** is the **startup project**, then open the **Package Manager Console** (PMC):

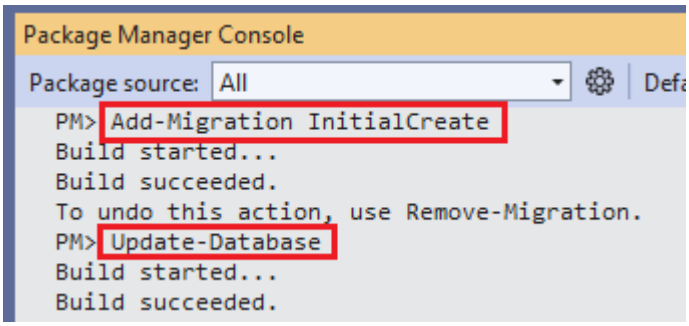
Option A: Using PMC in Visual Studio

```
PM> Add-Migration InitialCreate -Project SMS.Infrastructure -StartupProject SMS.API
PM> Update-Database -Project SMS.Infrastructure -StartupProject SMS.API
```

Run the following command in Package Manager Console so that it will automatically create database and its tables

```
PM> Add-Migration InitialCreate
Build started...
Build succeeded.
To undo this action, use Remove-Migration.
PM> Update-Database
```

```
Build started...
Build succeeded.
```



Option B: Using .NET CLI

```
dotnet ef migrations add InitialCreate -p SMS.Infrastructure -s SMS.API
dotnet ef database update -p SMS.Infrastructure -s SMS.API
```

```
echo Migration-DB Start...

dotnet ef migrations add InitialCreate -p SMS.Infrastructure -s SMS.API

dotnet ef database update -p SMS.Infrastructure -s SMS.API

echo Migration-DB End...
```

These commands will automatically create the `SMS_DB` database and all related tables.

▶☐ 5. Run the API

- In Visual Studio: Press `F5` or click on the **Run** button.
- In CLI: Navigate to `SMS.API` project and run:

```
cd SMS.API
dotnet run
```

Once the application runs, it should open Swagger UI at:

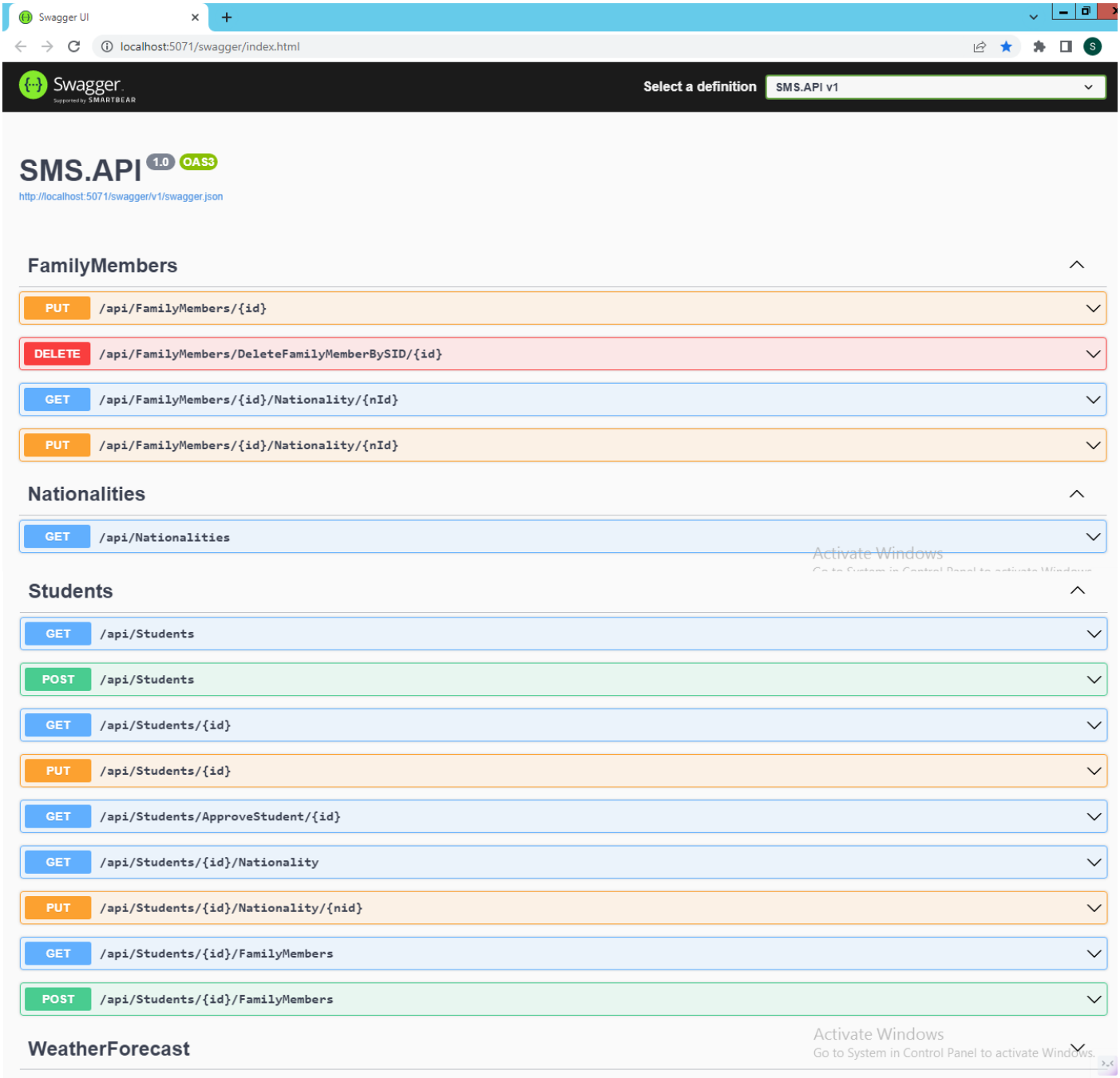
```
http://localhost:5071/swagger/index.html
```

📌 6. Verify Endpoints in Swagger

Test the following APIs in Swagger:

http://localhost:5071/swagger/index.html

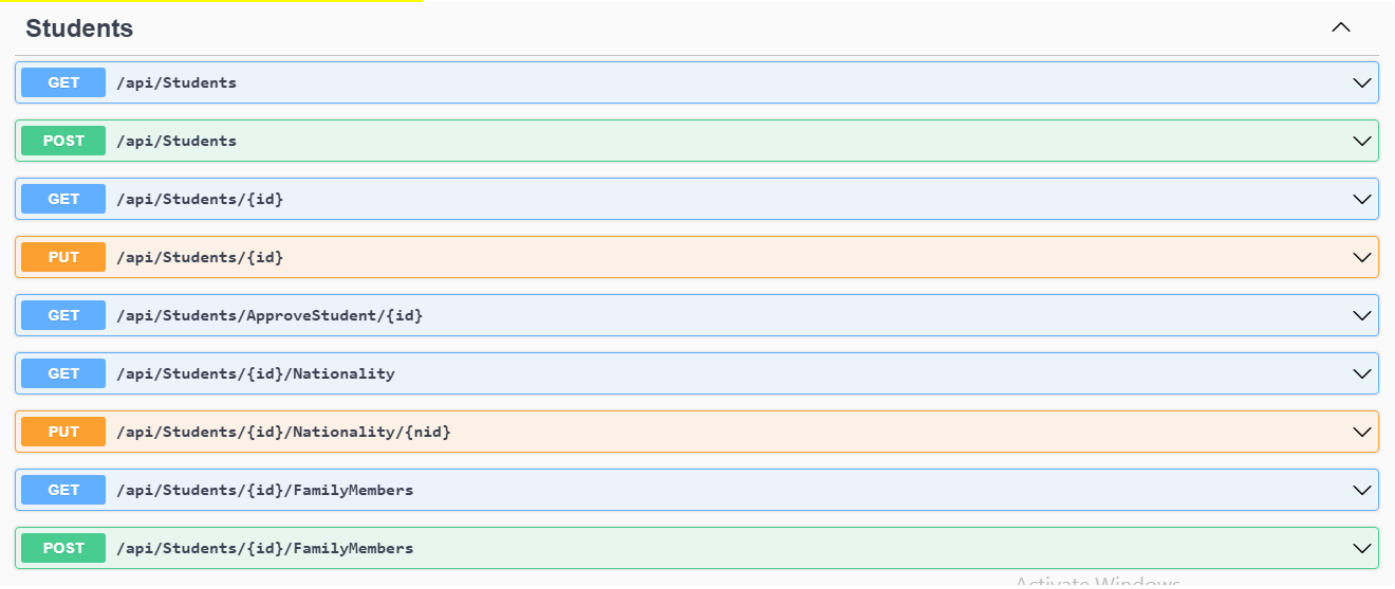
SMS.API with FamilyMembers, Nationalities and Students APIs



Students

- GET /api/Students
- POST /api/Students
- PUT /api/Students/{id}
- GET /api/Students/{id}/Nationality
- PUT /api/Students/{id}/Nationality/{id}

Students Endpoints:



Endpoints

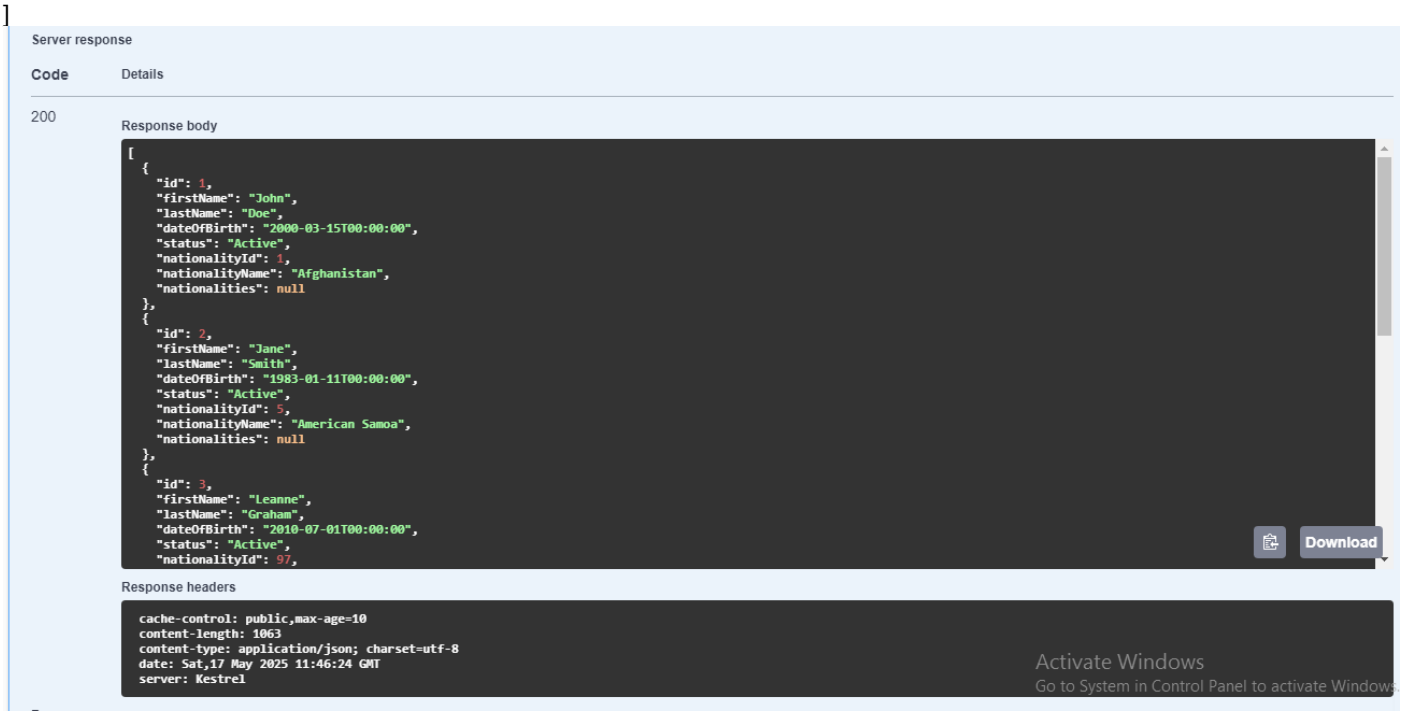
The following endpoints need to be created in order to fetch and store data.

Students

Get all Students

Response Sample:

[
{
"ID": 1,
"firstName": "John",
"lastName": "Doe",
"dateOfBirth": "2023-07-31T12:44:55.403Z"
}
]



Add a new Student with Basic Details Only

Request Sample:

{
"firstName": "John",

"lastName": "Doe",
"dateOfBirth": "2023-07-31T12:44:55.403Z"
}

Response Sample:

{
"ID": 1,
"firstName": "John",
"lastName": "Doe",
"dateOfBirth": "2023-07-31T12:44:55.403Z"
}

Updates a Student's Basic Details only

Request Sample:

{
"ID": 1,
"firstName": "John Update",
"lastName": "Doe",
"dateOfBirth": "2023-07-31T12:44:55.403Z"
}

Response Sample:

{
"ID": 1,
"firstName": "John Update",
"lastName": "Doe",
"dateOfBirth": "2023-07-31T12:44:55.403Z"
}

Gets the Nationality of a particular student

Response Sample:

{
"ID": 1,
"firstName": "John",
"lastName": "Doe",
"nationalityId": 1,
}

Updates a Student's Nationality

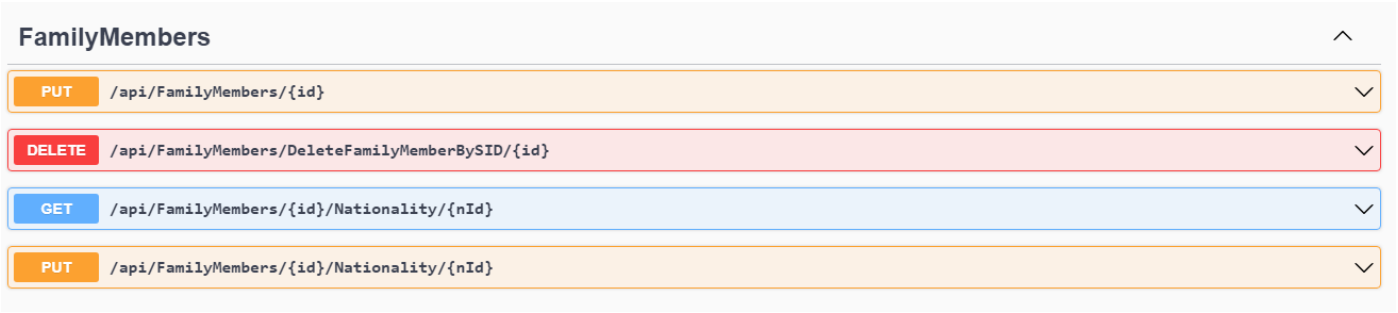
Response Sample:

{
"ID": 1,
"firstName": "John",
"lastName": "Doe",
"nationalityId":2
}

Family Members

- `GET /api/Students/{id}/FamilyMembers/`
- `POST /api/Students/{id}/FamilyMembers/`
- `PUT /api/FamilyMembers/{id}`
- `DELETE /api/FamilyMembers/{id}`
- `GET /api/FamilyMembers/{id}/Nationality/{id}`
- `PUT /api/FamilyMembers/{id}/Nationality/{id}`

Family Members Endpoints:



Gets Family Members for a particular Student

Response Sample:

[
{
"ID": 2,
"firstName": "John Son",
"lastName": "John Family",
"dateOfBirth": "2023-07-31T12:44:55.403Z"
"relationshipId": 3
}
]

Creates a new Family Member for a particular Student (without the nationality)

Request Sample:

{
"firstName": "John Son",
"lastName": "John Family",
"dateOfBirth": "2023-07-31T12:44:55.403Z"
"relationshipId": 3
}

Response Sample:

{
"ID": 2,
"firstName": "John Son",
"lastName": "John Family",
"dateOfBirth": "2023-07-31T12:44:55.403Z"
"relationshipId": 3
}

Family Members

Updates a particular Family Member

Request Sample:

{
"firstName": "John Son",
"lastName": "John Family",
"dateOfBirth": "2023-07-31T12:44:55.403Z"
"relationshipId": 3
}

Response Sample:

{
"ID": 2,
"firstName": "John Son",
"lastName": "John Family",
"dateOfBirth": "2023-07-31T12:44:55.403Z"
"relationshipId": 3
}

Deletes a family member for a particular Student

Gets a nationality associated with a family member

Response Sample:

{
"ID": 2,
"firstName": "John Son",
"lastName": "John Family",
"dateOfBirth": "2023-07-31T12:44:55.403Z"

"relationshipId": 3,
"nationalityId":2
}

Updates a particular Family Member's Nationality

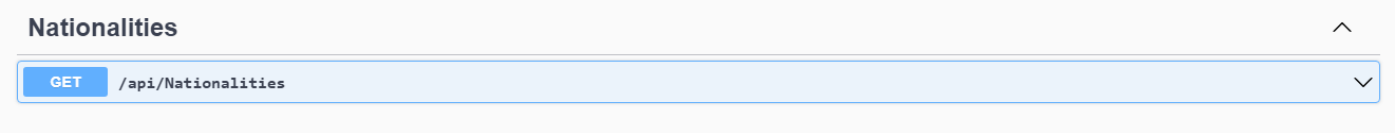
Response Sample:

{
"ID": 2,
"firstName": "John Son",
"lastName": "John Family",
"dateOfBirth": "2023-07-31T12:44:55.403Z"
"relationshipId": 3,
"nationalityId":1
}

Nationalities

- `GET /api/Nationalities`

Nationality Endpoints:



Nationality

Gets all nationalities in the system

□ 7. Run Unit Tests (Optional)

In Visual Studio:

- Open **Test Explorer** → Run All Tests.

In CLI:

```
cd SMS.Tests
dotnet test
```
