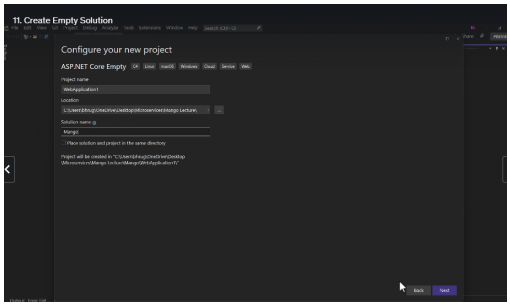
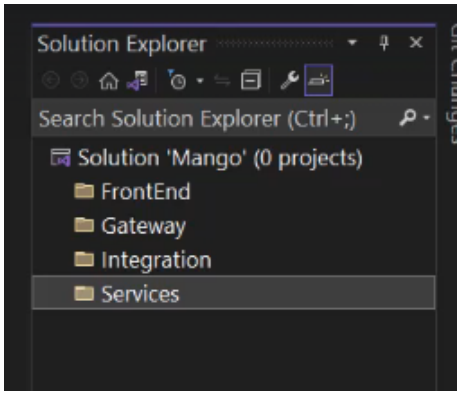
Section 2 - Coupons API (Part1)

- **Setting Up the Project**
  - Creating a New Project
    - Opening Visual Studio
      - Open Visual Studio to start a new project.
    - Selecting Project Type
      - Since we are building a microservices architecture, we need to create individual projects.
      - Empty Solution
        - Previously, there was an option for an empty solution, but it has been removed.
        - Create an ASP.NET Core empty project as a workaround.



    - Project Configuration
      - Project Name and Solution Name
        - Project name is not important, but the solution name should be "mango."
        - Framework: .NET 8.
        - Do not use top-level statements.
      - Creating the Project
        - Hit the create button to generate the project.
        - Delete the temporary project to have an empty solution.
- **2. Organizing the Solution**

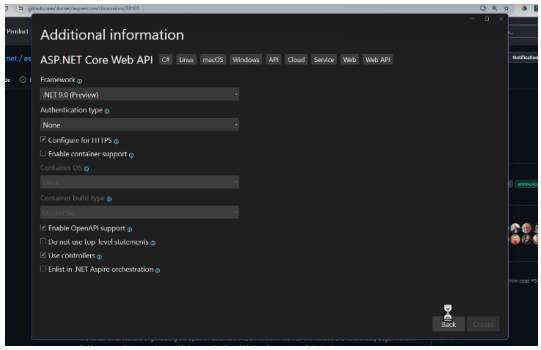
- Folder Structure



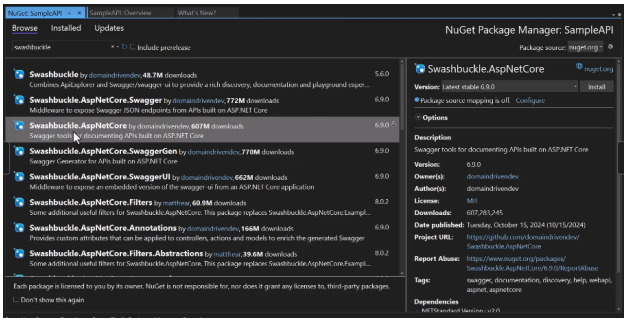
  - Front-End Folder
    - Create a folder for the front-end application, which will be the MVC web application calling the microservices.
  - Gateway Folder
    - Create a folder for the gateway, which will be used for advanced concepts with Gateway later in the course.
  - Integration Folder
    - Create a folder for integration, which will handle messaging and related functionalities.
  - Services Folder
    - Create a folder for services, where all microservices or API endpoints will be developed.

3.Swashbuckle

- Installing Swashbuckle
  - Creating a New API Project
    - Create a new ASP.NET Core API project named "sample API."
    - Use .NET 9, enable OpenAPI support, and use controllers.



- Install Swashbuckle ASP.NET Core via NuGet packages.



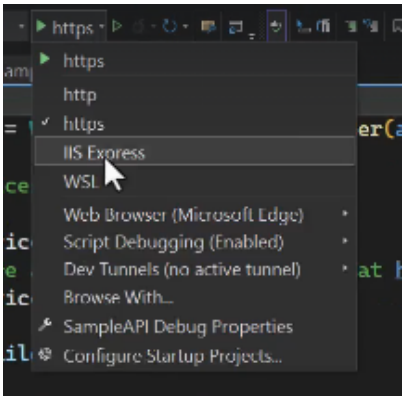
- Configuring Swagger
  - Open Program.cs and remove the default OpenAPI configuration.

```
builder.Services.AddControllers();
// Learn more about configuring OpenAP
builder.Services.AddOpenApi();

var app = builder.Build();
```

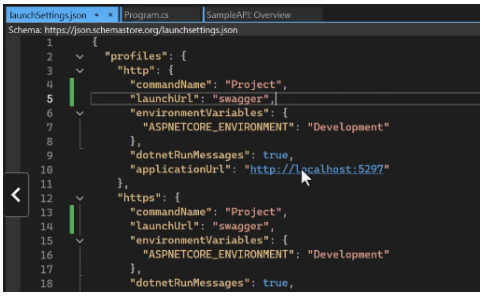
  - Add builder.Services.AddSwaggerGen() to the service container.

```
builder.Services.AddSwaggerGen();

var app = builder.Build();

// Configure the HTTP request pipeline.
if (app.Environment.IsDevelopment())
{
    app.UseSwagger();
    app.UseSwaggerUI();
}
```

  - Add app.UseSwagger() and app.UseSwaggerUI() to the pipeline for development.
- Running the Application
  - Change the launch settings to use IIS Express.



- Modify launchSettings.json to set the default path to Swagger.

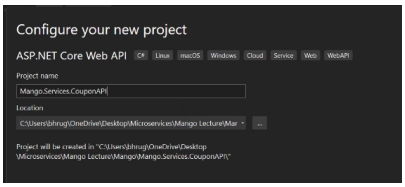


  - Change in IISExpress

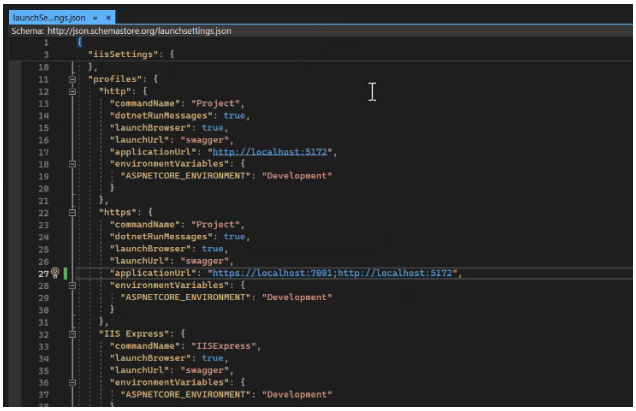
- Run the application to ensure Swagger documentation loads by default.

4. Creating the Coupon API

- Project Setup
  - Creating the Coupon API Project



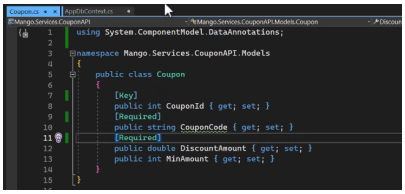
  - Create a new ASP.NET Core Web API project named "mango.services.couponAPI."
  - Use .NET 8 and controllers.
  - Configuring the Project
    - Run the application to ensure it is set up correctly.
    - Update the port number to 7001 in launchSettings.json.



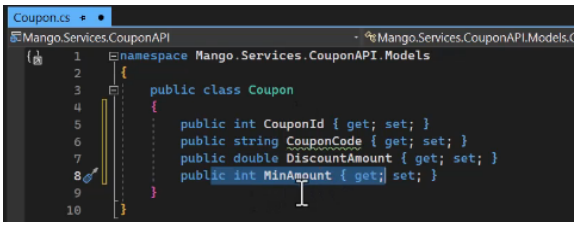
5. Building the Coupon Model

- Creating the Model

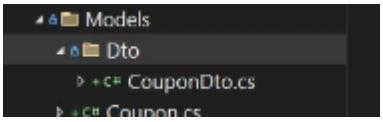
- Coupon Model



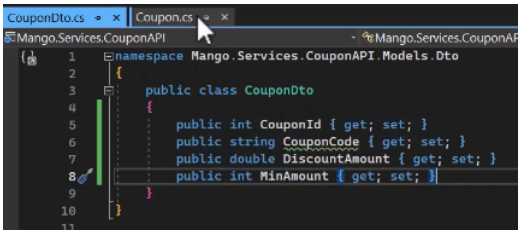
  - Create a new folder for models and add a class file named "Coupon.cs."
  - Define properties: CouponID, CouponCode, DiscountAmount, and MinimumAmount.



- DTO (Data Transfer Object)
  - Create a DTO folder and add a class file named "CouponDTO.cs."

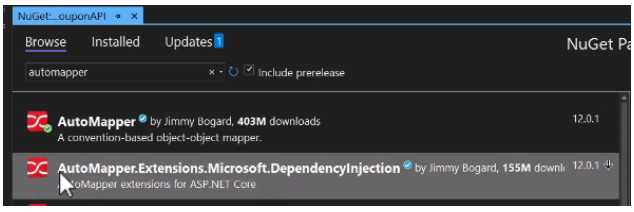


  - Copy the properties from the Coupon model to the CouponDTO.

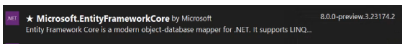


6. Setting Up the Database

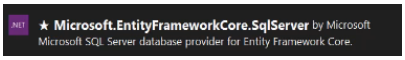
- Installing NuGet Packages
  - AutoMapper
    - Install AutoMapper and AutoMapper.Extensions.Microsoft.DependencyInjection.



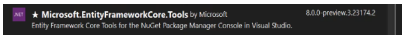
  - Entity Framework Core



- Install Microsoft.EntityFrameworkCore.SqlServer.



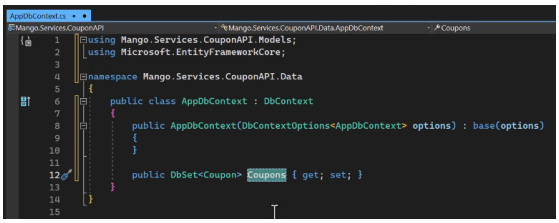
- Install Microsoft.EntityFrameworkCore.Tools.



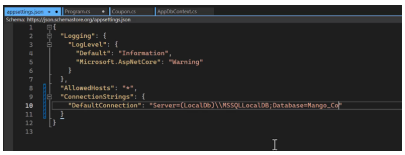
- Install Microsoft.AspNetCore.Authentication.JwtBearer.

- Configuring the Database

  - Create a new folder for data and add a class file named "AppDbContext.cs."



  - Implement the DbContext class and configure the connection string in appsettings.json.



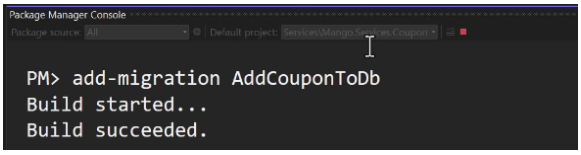
  - Add the connection string to the service container in Program.cs.

7. Creating the Database and Tables

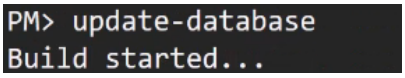
- Adding Migrations

  - Initial Migration

    - Use the Package Manager Console to add a migration named "AddCouponToDB."



    - Update the database to create the Coupon table.



  - Seeding the Database

- Override the OnModelCreating method in AppDbContext.cs to seed initial data.

```
protected override void OnModelCreating(ModelBuilder modelBuilder)
{
    base.OnModelCreating(modelBuilder);


    modelBuilder.Entity<Coupon>().HasData(new Coupon
    {
        CouponId = 1,
        CouponCode = "10OFF",
        DiscountAmount = 10,
        MinAmount = 20
    });
}
```

- Add a new migration named "SeedCouponTables."

```
Package Manager Console
Package source: All        Default project: Services\Mango.Services.Coupon
        VALUES (N'20230417175518_AddCouponTo
Done.
PM> add-migration SeedCouponTables
Build started...
```

- Implement a method to apply migrations automatically on application startup.

```
void ApplyMigration()
{
    using (var scope = app.Services.CreateScope())
    {
        var _db = scope.ServiceProvider.GetRequiredService<AppDbContext>();

        if (_db.Database.GetPendingMigrations().Count() > 0)
        {
            _db.Database.Migrate();
        }
    }
}
```

8. Building the Coupon API Controller

Creating the Controller

CouponAPIController

- Add a new API controller named "CouponAPIController.cs."

```
CouponAPIController.cs
Mango.Services.CouponAPI                    - Mango.Services.CouponAPI.Controllers.CouponAPIController
using Mango.Services.CouponAPI.Data;
using Mango.Services.CouponAPI.Models;
using Microsoft.AspNetCore.Http;
using Microsoft.AspNetCore.Mvc;

namespace Mango.Services.CouponAPI.Controllers
{
    [Route("api/[controller]")]
    [ApiController]
    public class CouponAPIController : ControllerBase
    {
        private readonly AppDbContext _db;

        public CouponAPIController(AppDbContext db)
        {
            _db = db;
        }

        [HttpGet]
        public object Get()
        {
            try
            {
                IEnumerable<Coupon> objList = _db.Coupons.ToList();
            }
            catch (Exception ex)
            {

            }
```

- Implement endpoints for CRUD operations: GetAll, GetById, GetByCode, Create, Update, and Delete.

```
[HttpGet]
//[Route("{id:int}")]
public object Get(int id)
{
    try
    {
        Coupon objList = _db.Coupons.First(u=>u.CouponId==id);
        return objList;
    }
    catch (Exception ex)
    {

    }
    return null;
}
```

Common Response DTO

- Create a class file named "ResponseDTO.cs" to define a common response structure.

```
namespace Mango.Services.CouponAPI.Models.Dto
{
    public class ResponseDto
    {
        public object? Result { get; set; }
        public bool IsSuccess { get; set; }
        public string Message { get; set; }
    }
}
```

- Modify the controller to return ResponseDTO for all endpoints.

```
[HttpGet]
[Route("{id:int}")]
public ResponseDto Get(int id)
{
    try
    {
        Coupon obj = _db.Coupons.First(u=>u.CouponId==id);
        _response.Result = obj;
    }
    catch (Exception ex)
    {
        _response.IsSuccess = false;
        _response.Message = ex.Message;
    }
    return _response;
}
```

9. Implementing AutoMapper

Configuring AutoMapper

Mapping Configuration

- Create a new class file named "MappingConfig.cs" to define mapping configurations.

```
using AutoMapper;
using Mango.Services.CouponAPI.Models;
using Mango.Services.CouponAPI.Models.Dto;

namespace Mango.Services.CouponAPI
{
    public class MappingConfig
    {
        public static MapperConfiguration RegisterMaps()
        {
            var mappingConfig = new MapperConfiguration(config =>
            {
                config.CreateMap<CouponDto, Coupon>();
                config.CreateMap<Coupon, CouponDto>();
            });
            return mappingConfig;
        }
    }
}
```

- Register the mapping configuration in Program.cs.

```
IMapper mapper = MappingConfig.RegisterMaps().CreateMapper();
builder.Services.AddSingleton(mapper);
builder.Services.AddAutoMapper(AppDomain.CurrentDomain.GetAssemblies());
```

Using AutoMapper in the Controller

- Inject AutoMapper using dependency injection.
- Use AutoMapper to map between Coupon and CouponDTO in the controller endpoints.

```
try
{
    IEnumerable<Coupon> objList = _db.Coupons.ToList();
    _response.Result = _mapper.Map<IEnumerable<CouponDto>>(objList);
}
catch (Exception ex)
```

10. Finalizing the Coupon API

- Testing the Endpoints
  - Running the Application
    - Run the application and use Swagger to test the endpoints.
    - Ensure that all CRUD operations (GetAll, GetById, GetByCode, Create, Update, Delete) are working as expected.

```
[HttpPost]
public ResponseDto Post([FromBody] CouponDto couponDto)
{
    try
    {
        Coupon obj = _mapper.Map<Coupon>(couponDto);
        _db.Coupons.Add(obj);
        _db.SaveChanges();

        _response.Result = _mapper.Map<CouponDto>(obj);
    }
    catch (Exception ex)
    {
        _response.IsSuccess = false;
        _response.Message = ex.Message;
    }
```