Working with ASP.NET Core Web API

# 1. What is Web API?

Web API (Application Programming Interface) in ASP.NET Core is a framework that allows you to build HTTP-based services. It is mainly used to provide data to mobile apps, web apps, IoT devices, or other services. It uses JSON by default but also supports XML.  
  
Example: An API for E-commerce to get products list:  
GET https://localhost:5001/api/products

# 2. Creating ASP.NET Core Web API

Steps:  
1. Open Visual Studio → Create a New Project → Select ASP.NET Core Web API.  
2. Configure project name and framework.  
3. A sample project will have:  
 - Controllers/WeatherForecastController.cs (sample API controller).  
 - Program.cs (app configuration).

Example API Controller:

using Microsoft.AspNetCore.Mvc;  
  
namespace MyApp.Controllers  
{  
 [ApiController]  
 [Route("api/[controller]")]  
 public class ProductsController : ControllerBase  
 {  
 private static List<string> products = new List<string> { "Laptop", "Phone", "Tablet" };  
  
 [HttpGet]  
 public IEnumerable<string> Get()  
 {  
 return products;  
 }  
  
 [HttpGet("{id}")]  
 public string Get(int id)  
 {  
 return products[id];  
 }  
  
 [HttpPost]  
 public void Post([FromBody] string product)  
 {  
 products.Add(product);  
 }  
 }  
}

This creates a RESTful API with endpoints like:  
- GET /api/products → Get all products  
- GET /api/products/1 → Get product by ID  
- POST /api/products → Add a product

# 3. Difference between Web Service and Web API

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| Feature | Web Service | Web API |
| Definition | A service that communicates using SOAP (XML) | A service that communicates using REST (JSON, XML, etc.) |
| Protocol | SOAP, HTTP, SMTP, TCP | HTTP/HTTPS only |
| Data Format | XML only | JSON, XML, text, etc. |
| Platform | Heavy, mostly used in enterprise apps | Lightweight, best for web & mobile apps |
| Performance | Slower (XML is heavy) | Faster (JSON is light) |
| Ease of Use | Harder to implement | Easy to implement |

In simple words:  
- Web Service = Old, SOAP, XML, strict.  
- Web API = New, REST, JSON, fast, lightweight.

# 4. Testing Web API

There are many ways to test an API:  
  
✅ Using Browser → For GET requests, just open https://localhost:5001/api/products.  
  
✅ Using Postman →  
 - GET https://localhost:5001/api/products → Shows list of products.  
 - POST https://localhost:5001/api/products → Add product by sending body like:   
 { "Headphones" }  
  
✅ Using Swagger (Built-in in .NET Core) →  
 - Run your project → Go to https://localhost:5001/swagger → Test APIs directly.