

DS3103

Webutvikling

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2022

.NET SDK, C# extension, Web API project

Contents

- Installing .NET/C# SDK
- Install C# extension for Visual Studio Code
- Create a first .NET/C# Web API test project in Visual Studio Code (VSC)

What are you going to install?

You will download/install two things:

1. .NET/C# SDK

- Contains the environment, classes, runtime, CLI (Command Line Interface) etc. for making .NET applications

2. C# Extension for Visual Studio Code (VSC)

- Intellisense and other types of support for C# in VSC

Download and install .NET SDK

- Install .NET SDK (see next slide for print screen of this)
 - **Tutorial and instruction for download:**
 - <https://learn.microsoft.com/en-us/aspnet/core/tutorials/first-web-api?view=aspnetcore-7.0&tabs=visual-studio-code>
 - **Download page:**
 - <https://dotnet.microsoft.com/en-us/download/dotnet/6.0>

Visual Studio vs. Visual Studio Code?

- Note that it is the Visual Studio Code tutorial you want to follow, not the two other variants, when working in Visual Studio Code. Visual Studio is a different tool.

Prerequisites

~~Visual Studio~~

Visual Studio Code

~~Visual Studio for Mac~~

- [Visual Studio Code](#)
- [C# for Visual Studio Code \(latest version\)](#)
- [.NET 6.0 SDK](#)

The Visual Studio Code instructions use the .NET CLI for ASP.NET Core development functions such as project creation. You can follow these instructions on macOS, Linux, or Windows and with any code editor. Minor

Print screen download .NET Core SDK

Download .NET 6.0 (Linux, macOS)

← → ↺

https://dotnet.microsoft.com/en-us/download/dotnet/6.0

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❓ Not sure what to download? [See recommended downloads for the latest version of .NET.](#)

6.0.10

Security patch ⓘ

[Release notes](#) Latest release date October 11, 2022

Build apps - SDK ⓘ

Run apps - Runtime ⓘ

SDK 6.0.402

ASP.NET Core Runtime 6.0.10

OS	Installers	Binaries
Linux	Package manager instructions	Arm32 Arm32 Alpine Arm64 Arm64 Alpine x64 x64 Alpine
macOS	Arm64 x64	Arm64 x64
Windows	Arm64 x64 x86 winget instructions	Arm64 x64 x86
All	dotnet-install scripts	

Visual Studio support

Visual Studio 2022 (v17.3)

Visual Studio 2022 for Mac (v17.0 latest preview)

The ASP.NET Core Runtime enables you to run existing web/server applications. **On Windows, we recommend installing the Hosting Bundle, which includes the .NET Runtime and IIS support.**

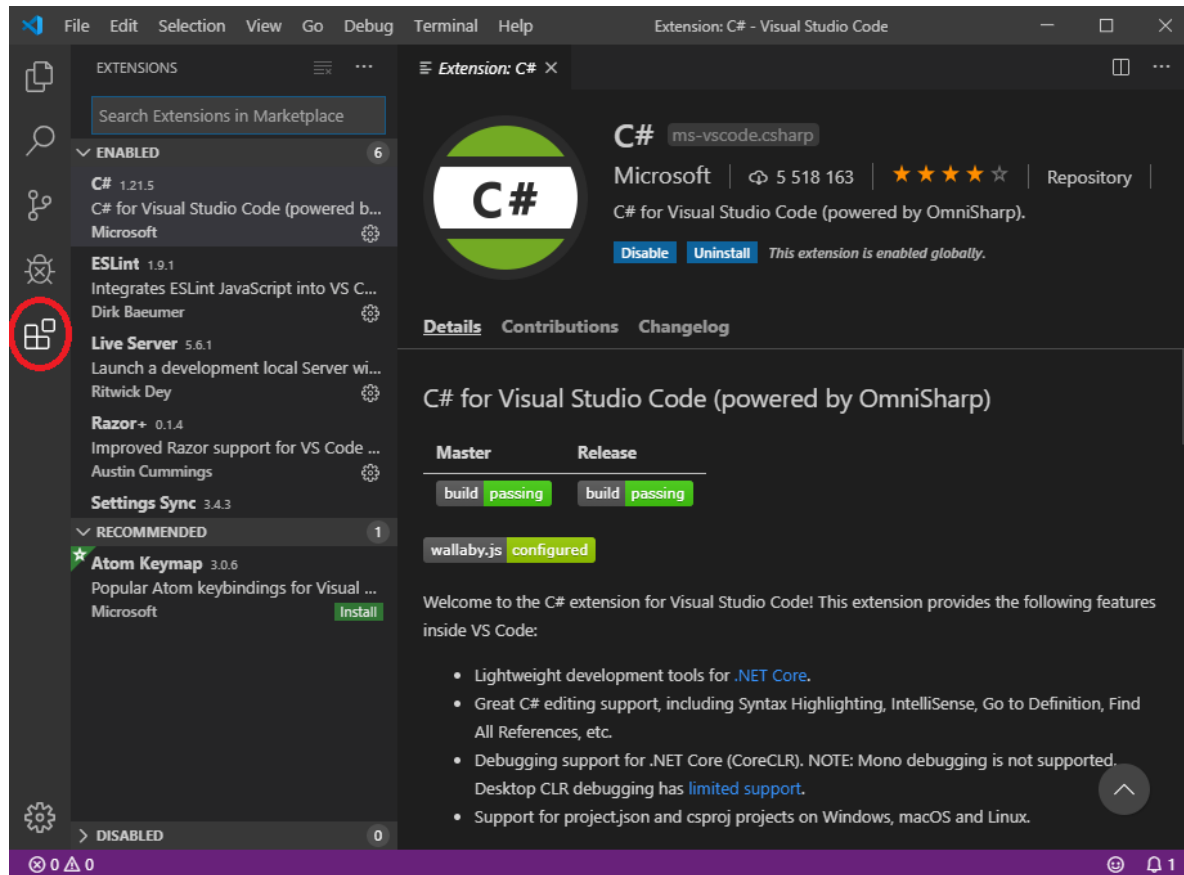
IIS runtime support (ASP.NET Core Module v2)
16.0.22270.10

OS	Installers	Binaries
Linux	Package manager instructions	Arm32 Arm32 Alpine Arm64 Arm64 Alpine x64 x64 Alpine
macOS		Arm64 x64
Windows	Hosting Bundle x64 x86	Arm64 x64 x86

Feedback

Installing C# extension in VSC

- On the left side there is an icon for extensions.
- Search for the C# extension by Microsoft
- Note that in some (rare) cases you may have to restart VSC to have it properly installed



Check SDK version(s) installed

- In Terminal/CMD you can check version(s)* of the .NET SDK which are installed with this command:

dotnet --list-sdks

- In 2021 the newest version should be a 6.x.x version

**it is nothing wrong with more than one being listed*

Web API

Creating a first project

Create first Web API project

- Creating a new project refers in this context to going into command window / terminal to create a project folder (boilerplate) which contains configuration for a .NET Web API project.
- The project folder can then be opened in Visual Studio Code to develop a Web API (or other types of applications)

Create new Web API project

- Go into "Terminal" or "Command prompt" (Ledetekst) or the internal terminal in VSC.
- Go to desired folder to create a project (for example Desktop)
- Type in the 3 commands below (see also next slide showing this in terminal).

Create the project

From a console, run the following commands:

console

 Copy

```
mkdir TodoApi  
cd TodoApi  
dotnet new webapi
```

Example creating Web API project

- Example of typing the commands in CMD:

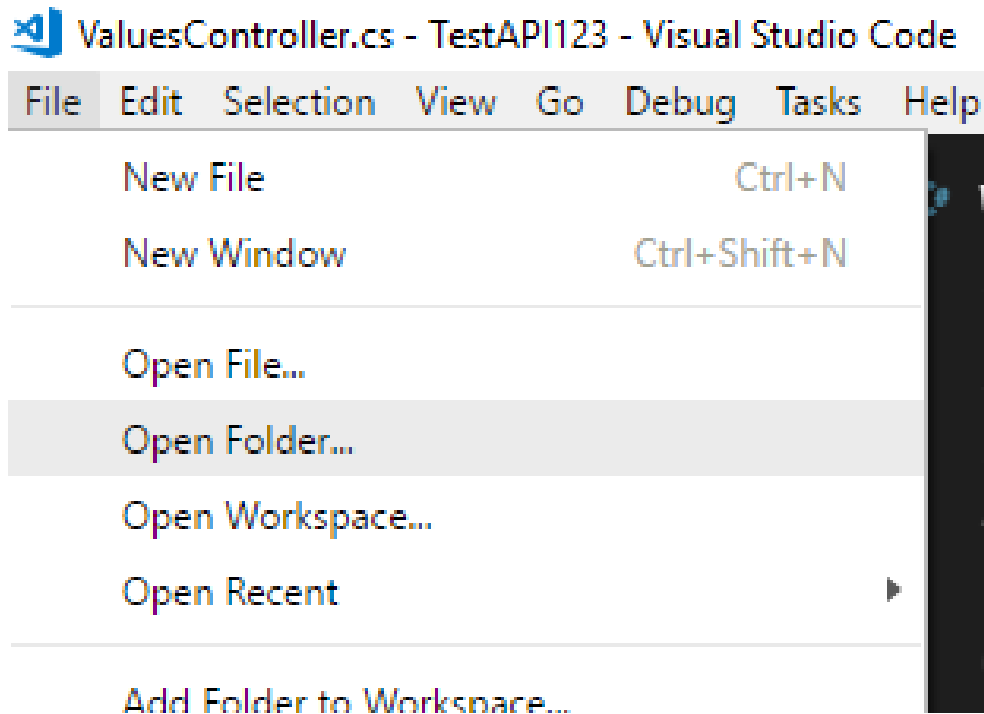
```
C:\Users\rogo001>cd desktop
C:\Users\rogo001\Desktop>mkdir TodoApi
C:\Users\rogo001\Desktop>cd Todoapi
C:\Users\rogo001\Desktop\TodoApi>dotnet new webapi
The template "ASP.NET Core Web API" was created successfully.

Processing post-creation actions...
Running 'dotnet restore' on C:\Users\rogo001\Desktop\TodoApi\TodoApi.csproj...
    Determining projects to restore...
    Restored C:\Users\rogo001\Desktop\TodoApi\TodoApi.csproj (in 175 ms).
Restore succeeded.

C:\Users\rogo001\Desktop\TodoApi>
```

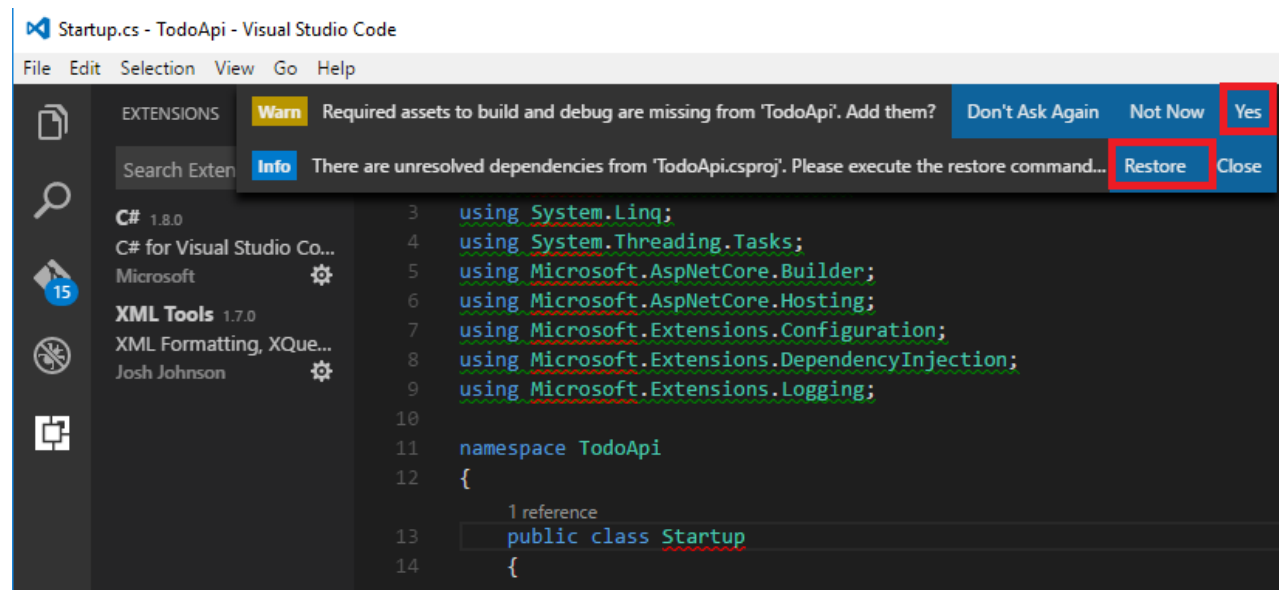
Opening Web API project with VSC

- Go into File and select Open Folder to open the Web API project



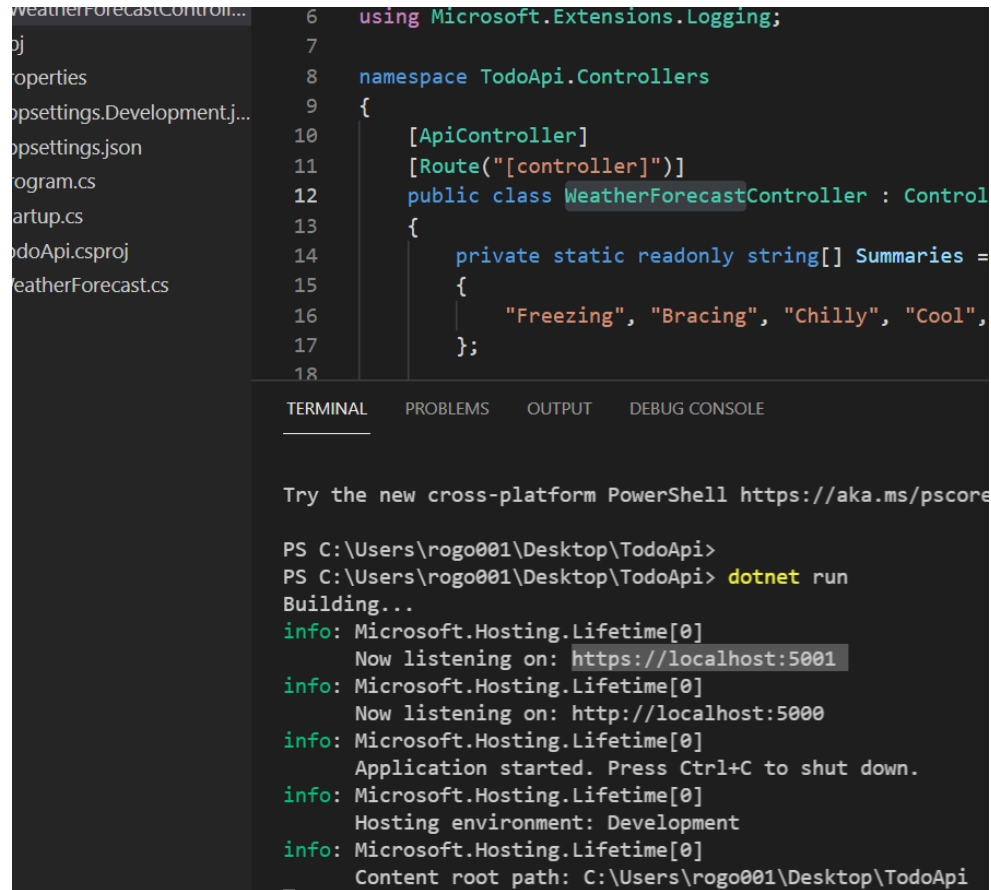
Opening Web API project with VSC

- Open the project in Visual Studio Code.
- Notice that you may be asked to Add and Restore etc. the first time. It should not be necessary to answer Yes on the Add, but if you are asked about restoring one should choose Restore.



Running the application: dotnet run

- The *dotnet run* command will run the application
- Note: a local server will be made, however, there will not be anything displayed on the web page unless you add */weatherforecast* at the end of the localhost url in the browser



The screenshot shows a Visual Studio IDE with a C# file named `WeatherForecastController.cs` open. The code defines a `WeatherForecastController` class that inherits from `ApiController` and is mapped to the `/weatherforecast` route. It contains a static array of weather summaries. Below the code editor, the `TERMINAL` tab is active, displaying the output of the `dotnet run` command. The terminal shows that the application is running on `https://localhost:5001` and `http://localhost:5000`.

```
6 using Microsoft.Extensions.Logging;
7
8 namespace TodoApi.Controllers
9 {
10     [ApiController]
11     [Route("[controller]")]
12     public class WeatherForecastController : ControllerBase
13     {
14         private static readonly string[] Summaries =
15         {
16             "Freezing", "Bracing", "Chilly", "Cool",
17         };
18     }
19 }
```

Try the new cross-platform PowerShell <https://aka.ms/powershell>

```
PS C:\Users\rogo001\Desktop\TodoApi>
PS C:\Users\rogo001\Desktop\TodoApi> dotnet run
Building...
info: Microsoft.Hosting.Lifetime[0]
      Now listening on: https://localhost:5001
info: Microsoft.Hosting.Lifetime[0]
      Now listening on: http://localhost:5000
info: Microsoft.Hosting.Lifetime[0]
      Application started. Press Ctrl+C to shut down.
info: Microsoft.Hosting.Lifetime[0]
      Hosting environment: Development
info: Microsoft.Hosting.Lifetime[0]
      Content root path: C:\Users\rogo001\Desktop\TodoApi
```

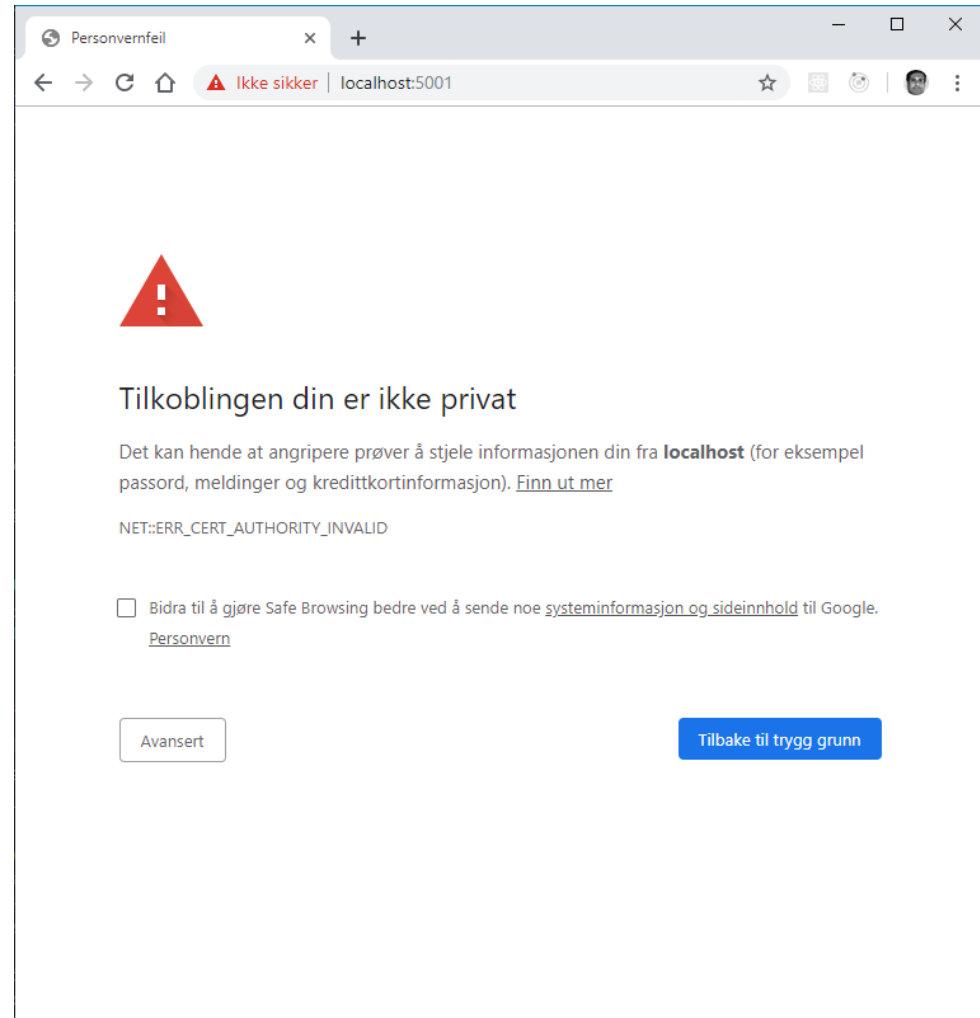
Errors when running
dotnet run, or warnings
in browser?

Notice: if errors when trying to run with dotnet run

- In some cases you may need to restart Visual Studio Code or even restart the laptop after downloading and installing .NET SDK and VSC. Do this if you get many error messages.

Notice: Error / Warning in browser

- You may receive a message in the browser telling you that localhost isn't safe.
- Go into Advanced and accept to go on.



Error message: «Crit: ...Kestrel,>

- If you get an error message in this style while trying to run the project: «*crit:*
Microsoft.AspNetCore.Server.Kestrel[0] Unable to start Kestrel.
System.InvalidOperationException:»
- ...you can run the following command to fix it (see also next slide):
`dotnet dev-certs https --trust`

Test the project

The project template creates a `WeatherForecast` API with support for [Swagger](#).

Visual Studio

Visual Studio Code

Visual Studio for Mac

- Trust the HTTPS development certificate by running the following command:

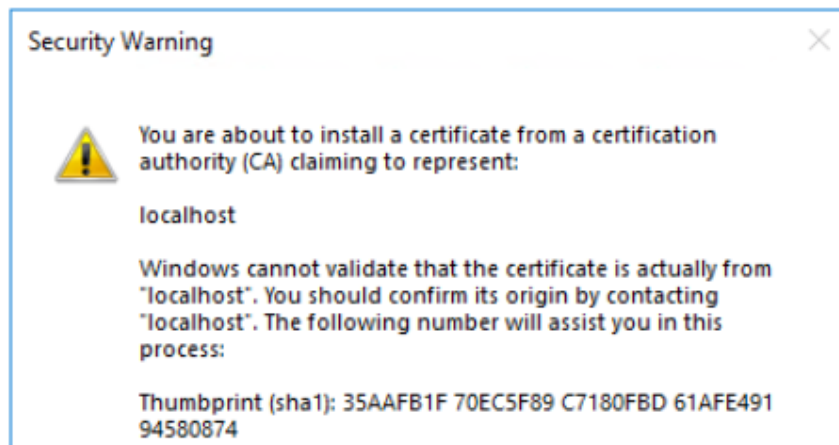
.NET CLI

Copy

```
dotnet dev-certs https --trust
```

The preceding command doesn't work on Linux. See your Linux distribution's documentation for trusting a certificate.

The preceding command displays the following dialog, provided the certificate was not previously trusted:



References

- Microsoft (2022): Create a Web API with ASP.NET Core MVC and Visual Studio Code on Linux, macOS, and Windows,
<https://learn.microsoft.com/en-us/aspnet/core/tutorials/first-web-api?view=aspnetcore-7.0&tabs=visual-studio-code>