Agenda Header

1. Complex Agenda File

    Documents:

        TYPESCRIPT.PDF
        ENVRONMENT.PDF

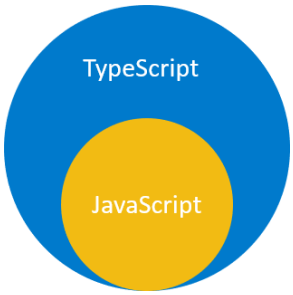
Agenda Footer

Getting Started with TypeScript

Introduction To TypeScript

What is TypeScript?

- TypeScript is superset of **JavaScript**—it adds extra features to JavaScript.
- It compiles (converts) into regular JavaScript, so it runs anywhere JavaScript does.
- Files end in **.ts** (instead of .js).



How TypeScript Works?

1. You write code in **TypeScript** (.ts files).
2. The **TypeScript compiler** converts it into **JavaScript** (.js files).
3. The JavaScript runs in browsers, Node.js, or any JS environment.

TypeScript vs. JavaScript

✅ **All JavaScript code is valid TypeScript!**

- If your JavaScript code works, it will work in TypeScript too.
- TypeScript just adds **optional features** (like types) to make coding safer and easier.

Why Use TypeScript?

- Helps catch mistakes **early** (before running the code).
- Makes large projects **easier to manage**.
- Works smoothly with existing JavaScript code.

Setting Up TypeScript

To begin with TypeScript, you'll need these tools:

- **Node.js**: This lets you run the TypeScript compiler.
- **TypeScript Compiler**: A tool that converts TypeScript code into JavaScript.
- **VS Code (Recommended)**: A free code editor that works great with TypeScript.

Step 1: Install Node.js

1. Visit the Node.js download page.
2. Download and install the correct version (18+ recommended) for your system.
3. Verify installation by opening the command line and running:

   node -v (or) **node --version**

You should see a version number (e.g., v22.12.0).

Step 2: Install the TypeScript Compiler

1. Open the command line.
2. Run this command:

   npm install -g typescript

3. Check if TypeScript is installed:

   tsc -v (or) **tsc --version**

   You should see a version number (e.g., Version 5.8.2).

Fix for Windows Users: If you get a 'tsc' is not recognized error:

1. Go to C:\Users\<your-username>\AppData\Roaming\npm
2. Copy this path and add it to your System Environment Variables.

Step 3: Install TSX (To Run TypeScript Directly)

To execute TypeScript files without compiling them first:

```
npm install -g tsx
```

Step 4: Install VS Code (Recommended Editor)

1. Go to the VS Code download page.
2. Download the version for your OS (Windows, Mac, or Linux).
3. Run the installer and follow the steps.
4. Open VS Code—you're ready to code!

Quick Summary

✅ **Node.js** → Runs TypeScript.
✅ **TypeScript Compiler (tsc)** → Converts .ts files to .js.
✅ **VS Code** → Best editor for TypeScript.
✅ **TSX** → Run TypeScript without compiling.

Now you're all set to start coding in TypeScript! 🚀

First TypeScript Program - Simple Steps

1. Create a Project Folder

- Make a new folder (e.g., TSDemo).

2. Open the Folder in VS Code

- Open VS Code → **File > Open Folder** → Select your folder.

3. Create a TypeScript File

- Inside the folder, create a file named app.ts.
- Add this simple code:

```
console.log("Welcome to TypeScript!");
```

4. Open the Terminal in VS Code

- Press Ctrl + ~ (backtick) or go to **Terminal > New Terminal**.

5. Compile TypeScript to JavaScript

- Run the command:

  tsc app.ts

- This generates app.js (the JavaScript version).

6. Run the JavaScript File

- Execute it using Node.js:

  node app.js

- **Output:**

  Welcome to TypeScript!

Run TypeScript Without Compiling (Recommended)

If you installed **tsx**, run:

tsx app.ts

(This runs `.ts` files directly!)

Expected Error while executing `tsc` command:

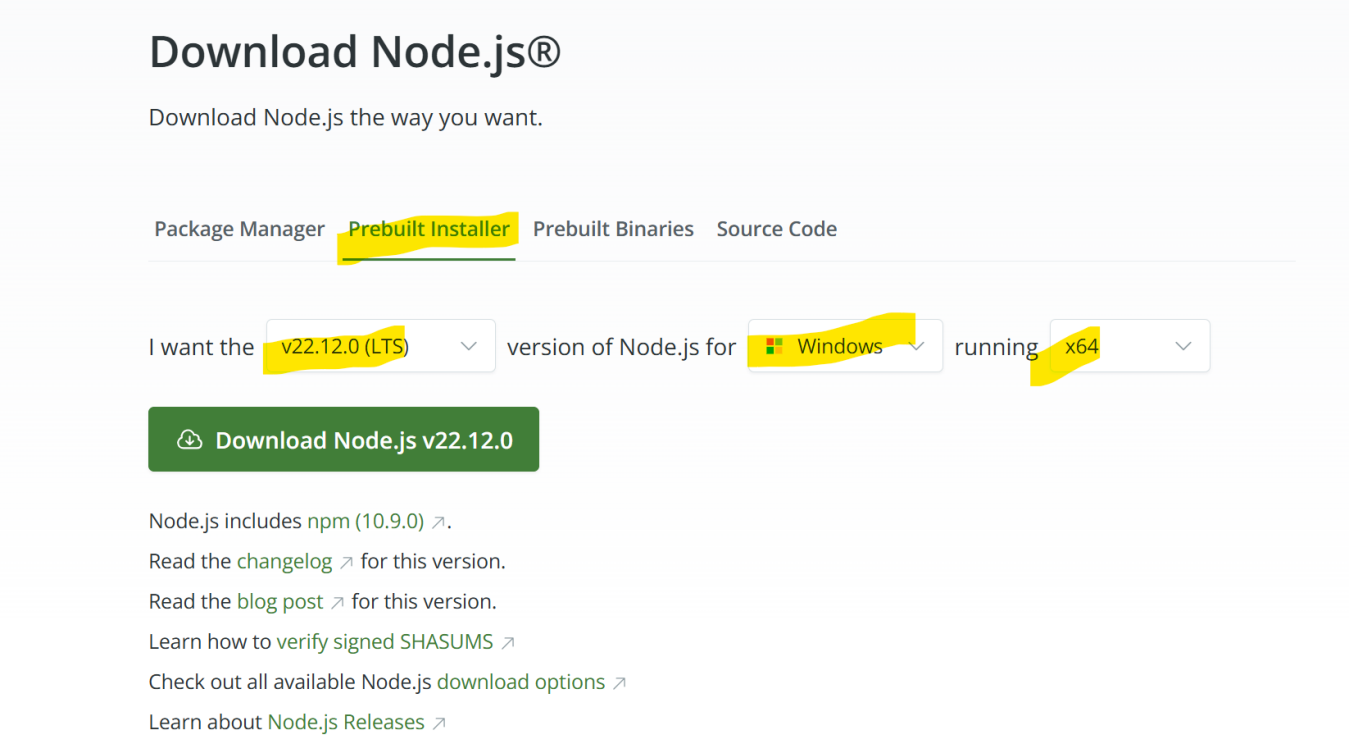
Solution:

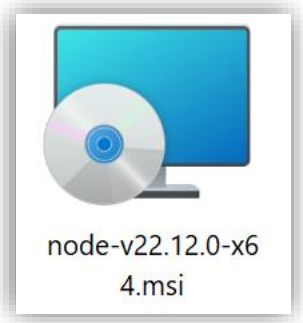
Run the below command in the terminal to fix Execution Policies error.

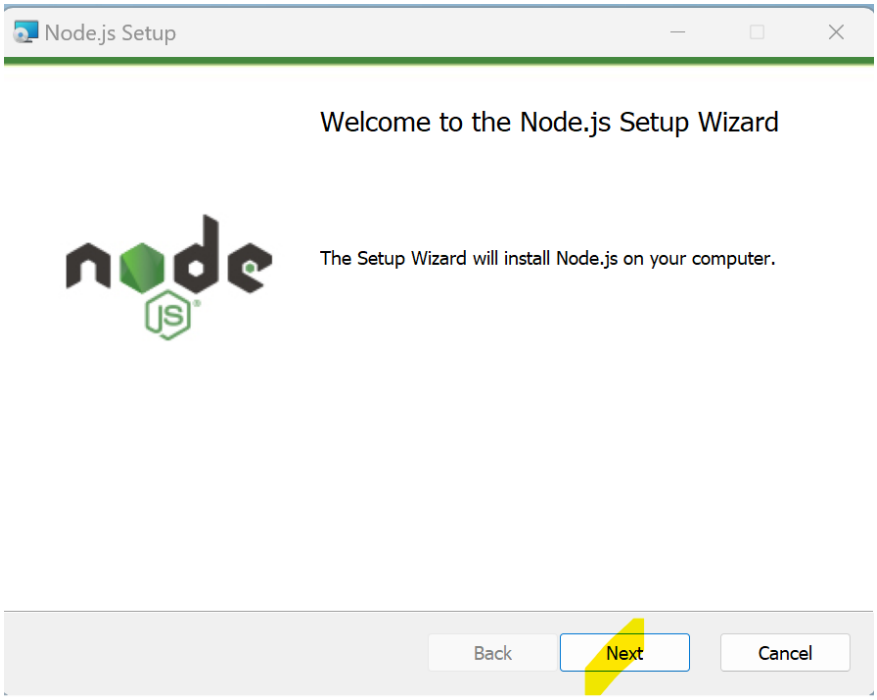
`Set-ExecutionPolicy -Scope CurrentUser -ExecutionPolicy RemoteSigned`

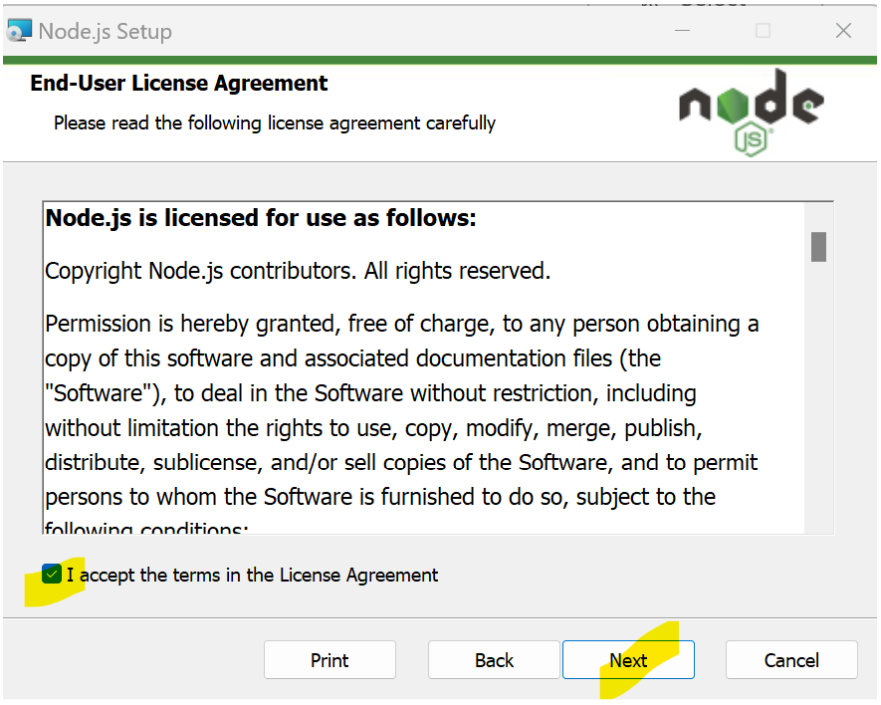
Step 1: Install NodeJS

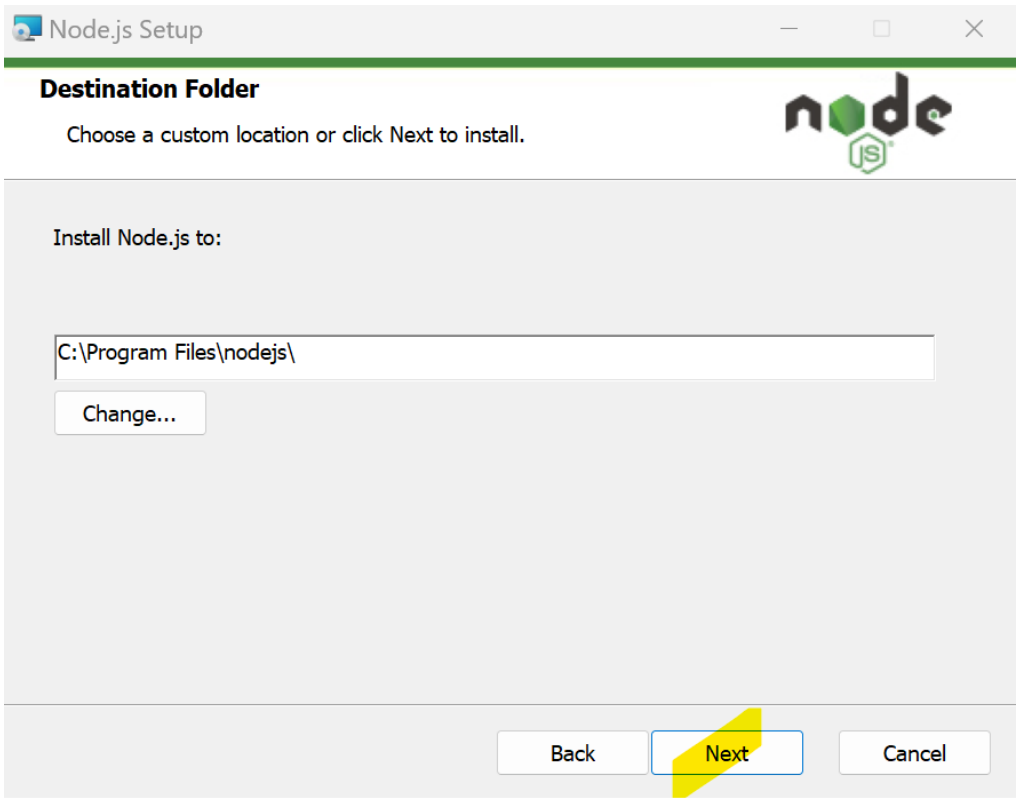
Download link: https://nodejs.org/en/download/

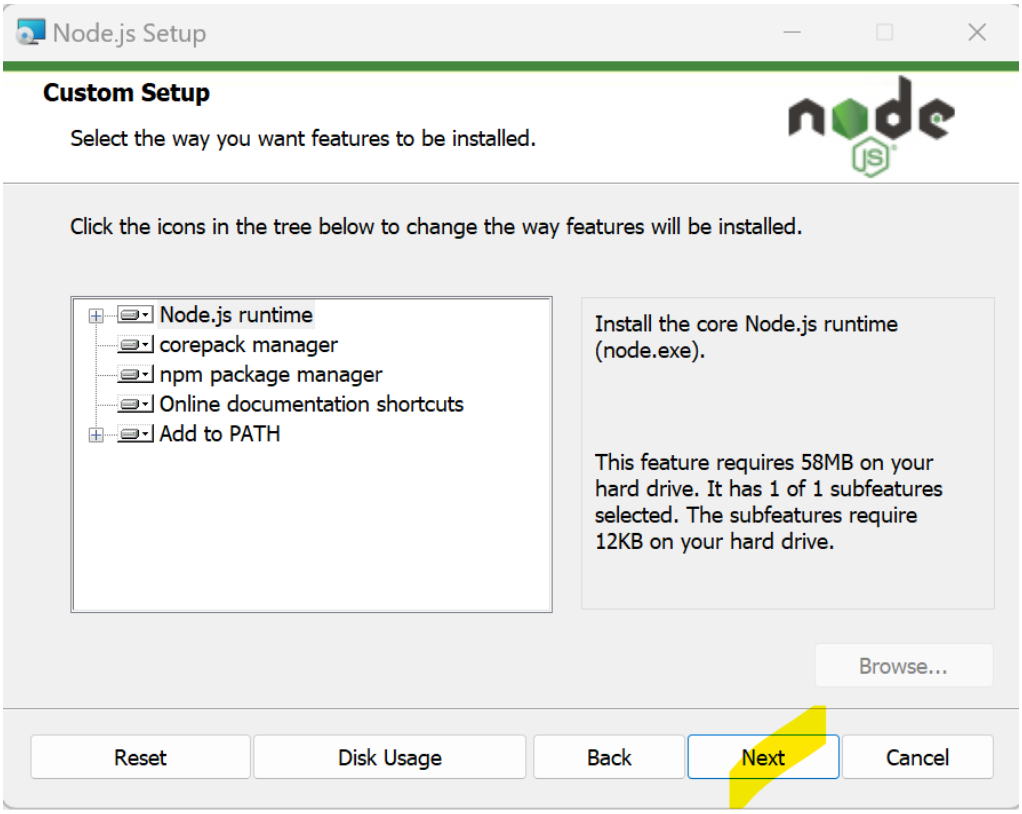


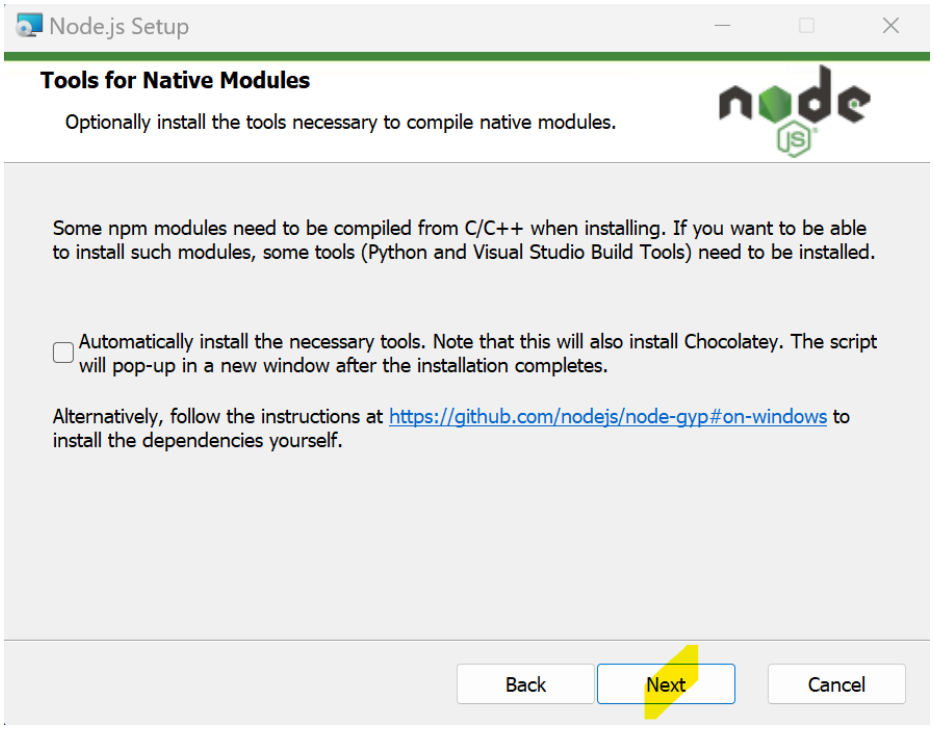


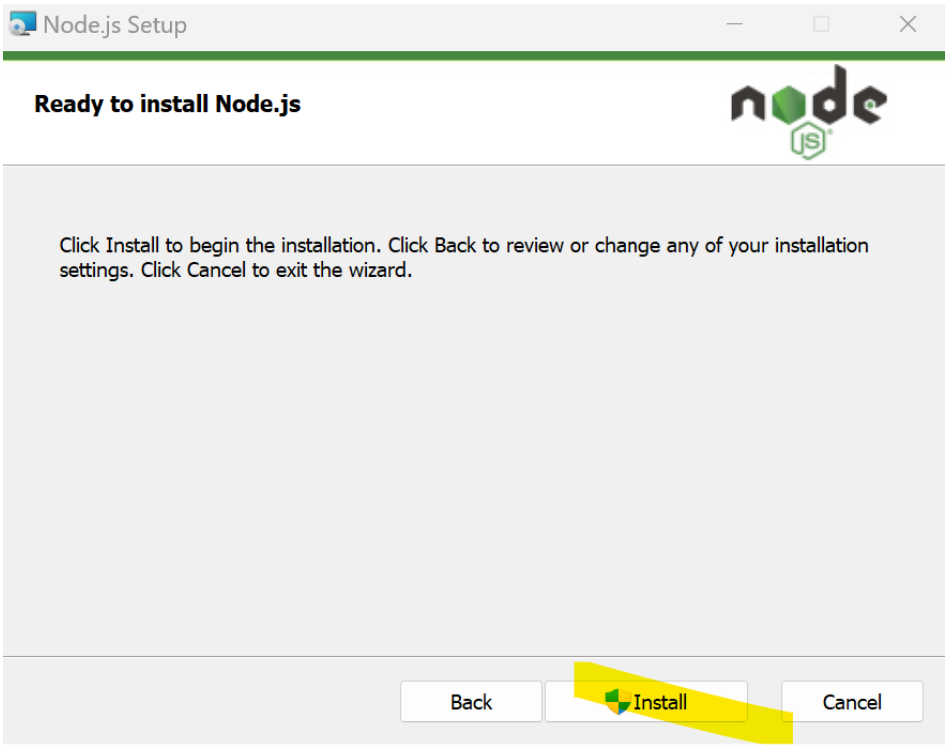

Node.js Setup
Welcome to the Node.js Setup Wizard
The Setup Wizard will install Node.js on your computer.
Back
Next
Cancel

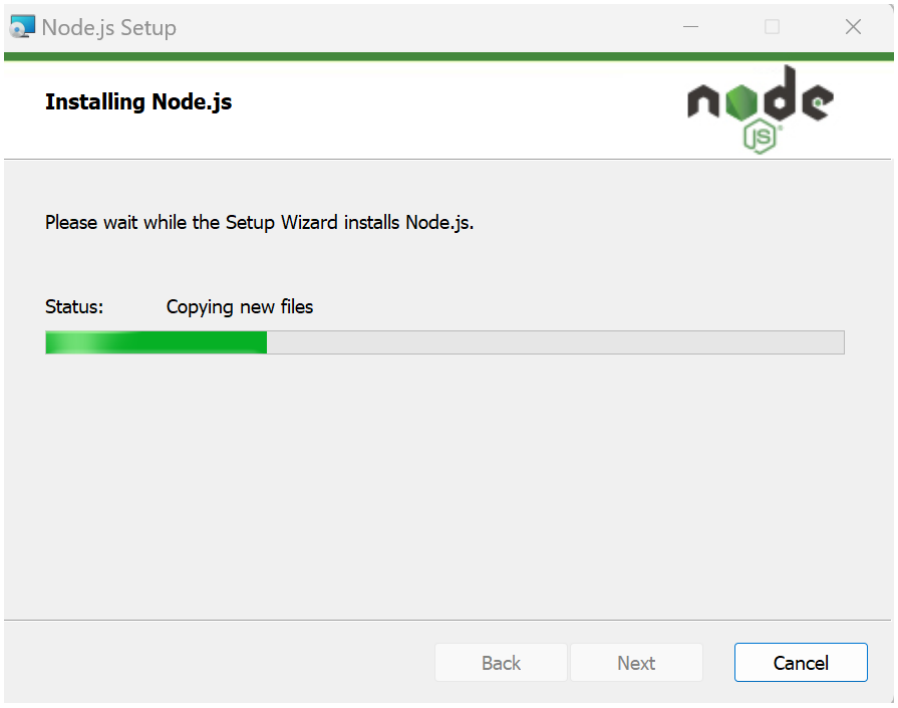

Node.js Setup
End-User License Agreement
Please read the following license agreement carefully
Node.js is licensed for use as follows:
Copyright Node.js contributors. All rights reserved.
Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the
I accept the terms in the License Agreement
Print
Back
Next
Cancel

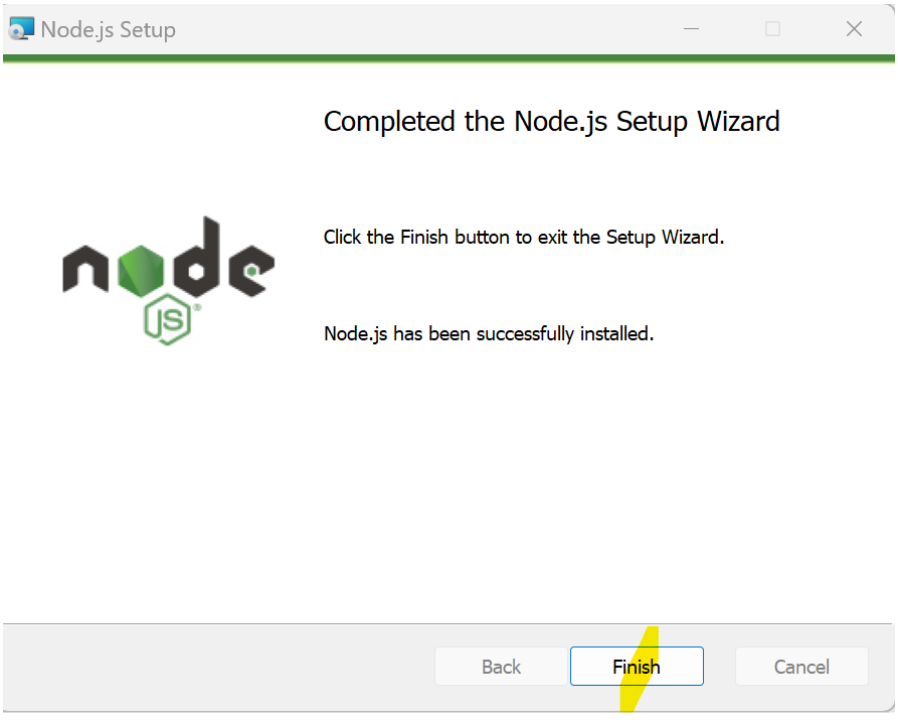

Node.js Setup
Destination Folder
Choose a custom location or click Next to install.
Install Node.js to:
C:\Program Files\nodejs\
Change...
Back
Next
Cancel


Node.js Setup
Custom Setup
Select the way you want features to be installed.
Click the icons in the tree below to change the way features will be installed.
Node.js runtime
corepack manager
npm package manager
Online documentation shortcuts
Add to PATH
Install the core Node.js runtime (node.exe).
This feature requires 58MB on your hard drive. It has 1 of 1 subfeatures selected. The subfeatures require 12KB on your hard drive.
Browse...
Reset
Disk Usage
Back
Next
Cancel

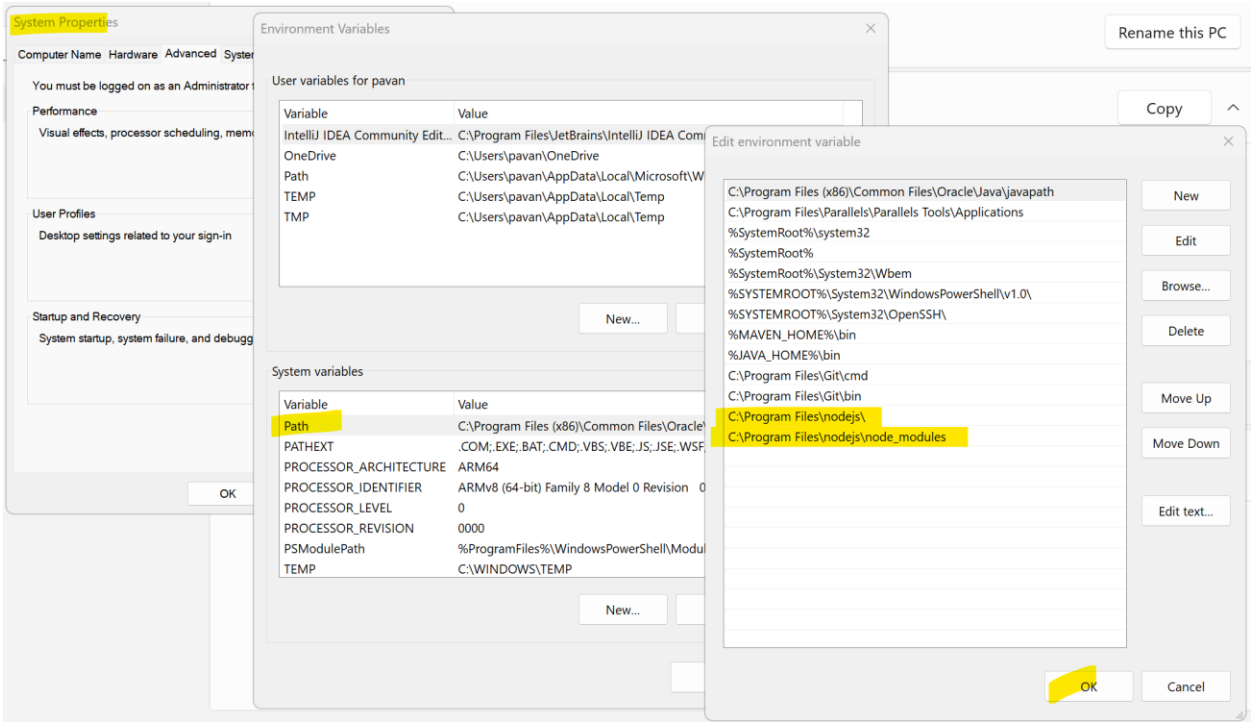

Node.js Setup
Tools for Native Modules
Optionally install the tools necessary to compile native modules.
Some npm modules need to be compiled from C/C++ when installing. If you want to be able to install such modules, some tools (Python and Visual Studio Build Tools) need to be installed.
Automatically install the necessary tools. Note that this will also install Chocolatey. The script will pop-up in a new window after the installation completes.
Alternatively, follow the instructions at https://github.com/nodejs/node-gyp#on-windows to install the dependencies yourself.
Back
Next
Cancel


Node.js Setup
Ready to install Node.js
Click Install to begin the installation. Click Back to review or change any of your installation settings. Click Cancel to exit the wizard.
Back
Install
Cancel

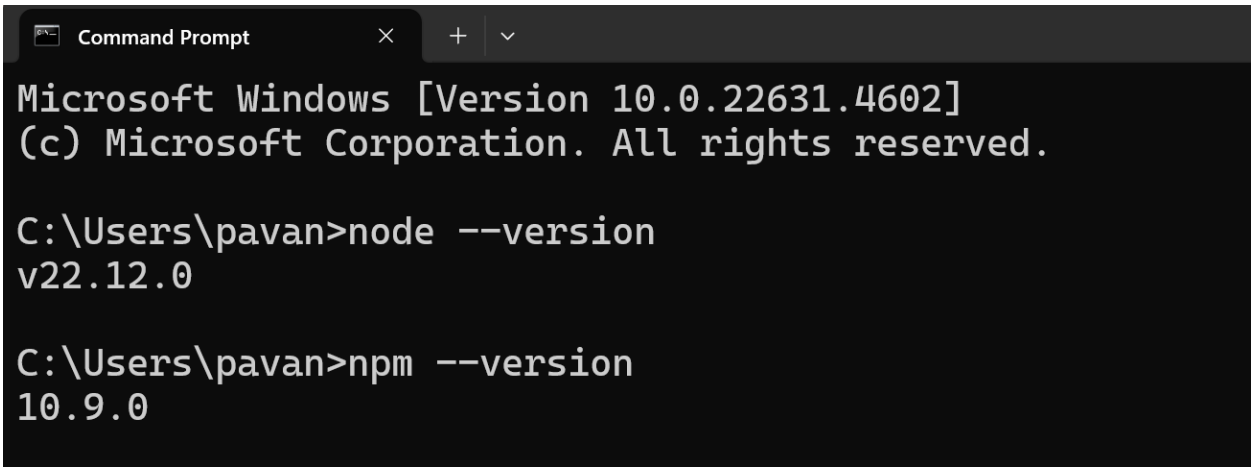

Node.js Setup
Installing Node.js
Please wait while the Setup Wizard installs Node.js.
Status: Copying new files
Back
Next
Cancel


Node.js Setup
Completed the Node.js Setup Wizard
Click the Finish button to exit the Setup Wizard.
Node.js has been successfully installed.
Back
Finish
Cancel

Set Environment variable:



Check node and npm versions (npm comes along with node.js)



Step 2: Install the TypeScript Compiler

To install the TypeScript compiler, you launch the Terminal on macOS or Linux and Command Prompt on Windows and type the following command:

```
npm install -g typescript
```

Current version the current version of TS compiler

```
tsc -v
```

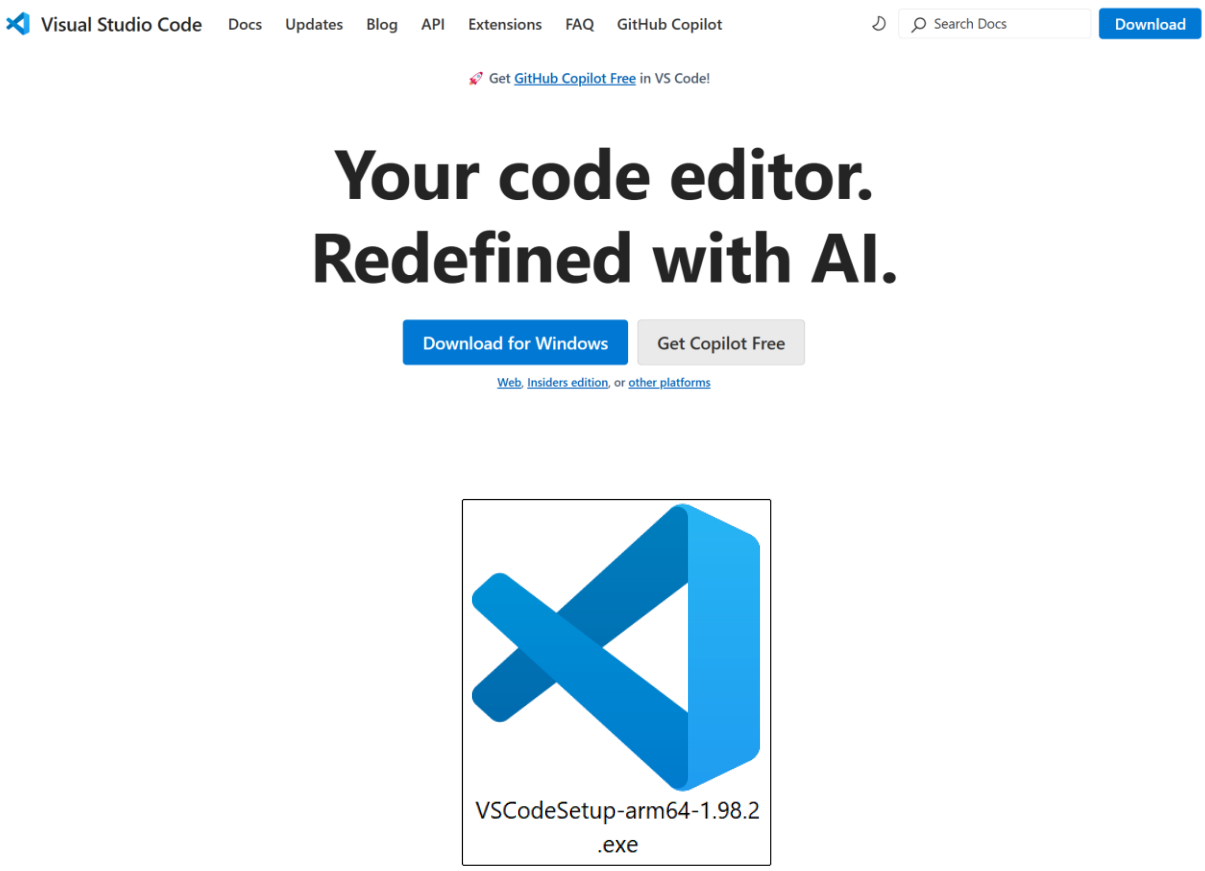
```
C:\Users\pavan>npm install -g typescript

added 1 package in 750ms

C:\Users\pavan>tsc --version
Version 5.8.2
```

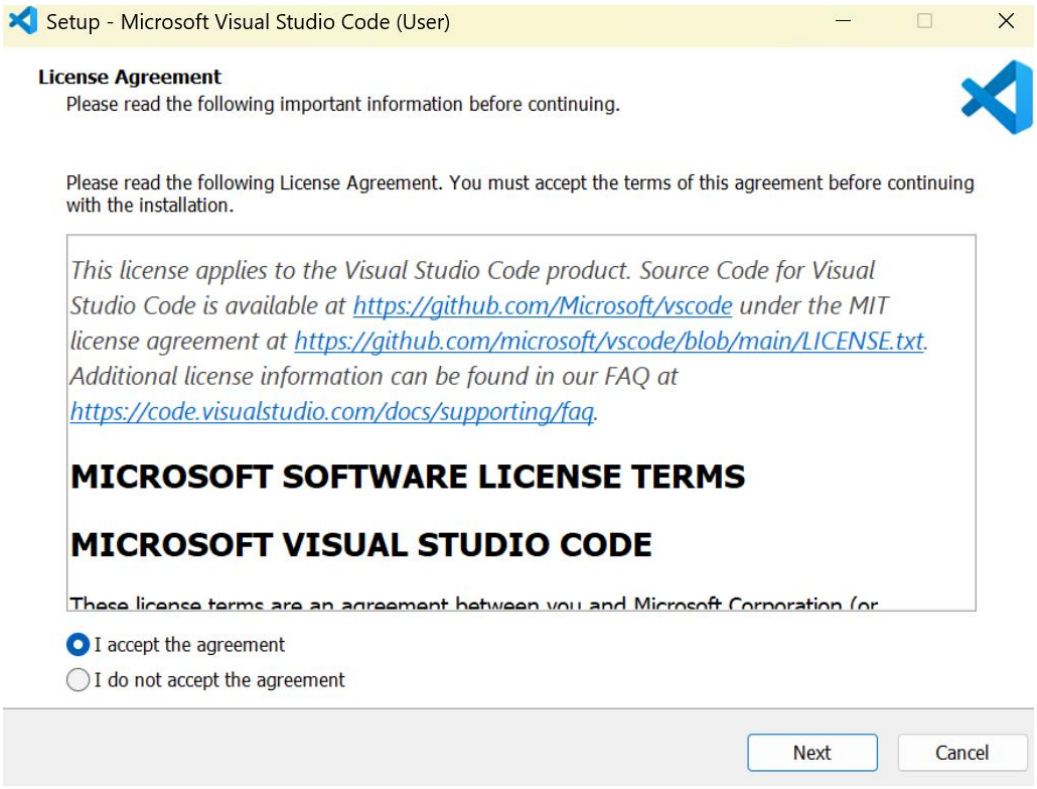
Step 3: Install TSX (Run TypeScript Without Compiling)

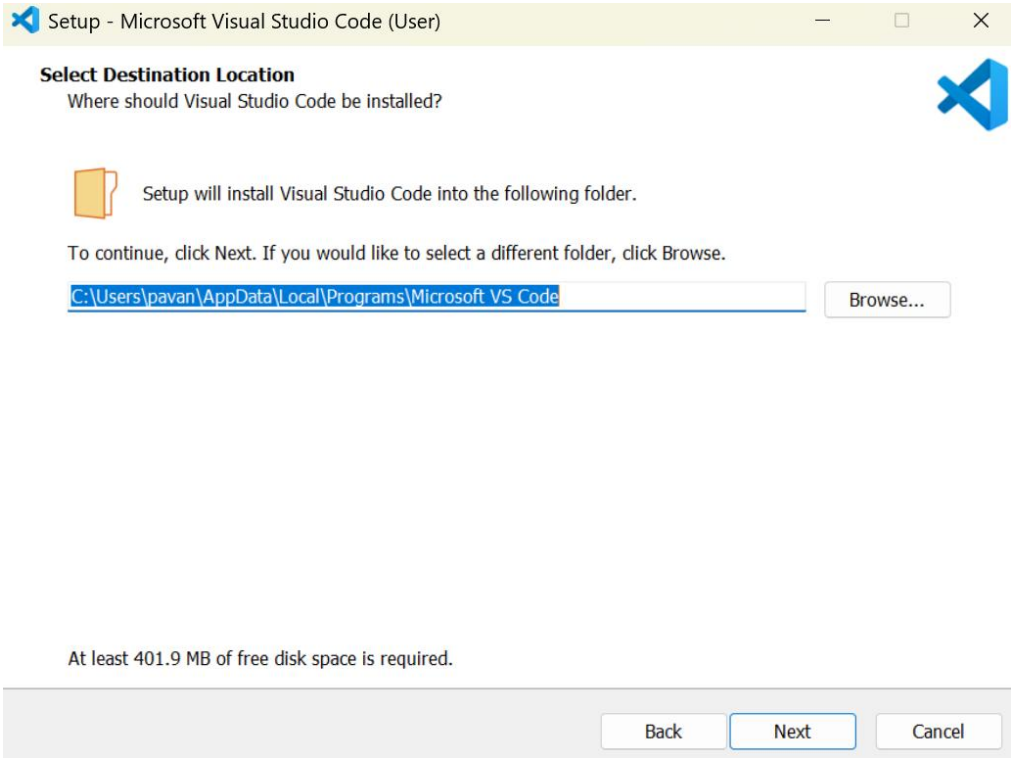
```
C:\Users\pavan>npm install -g tsx

added 5 packages in 3s
```

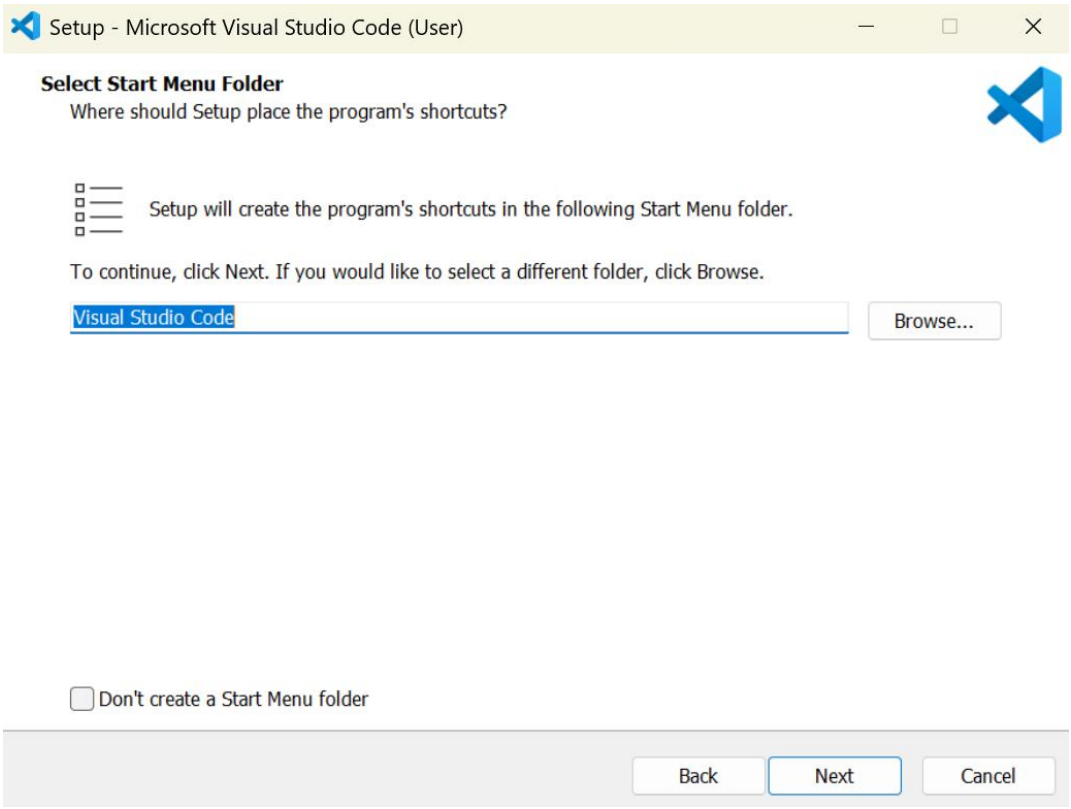
Step 4: Install VS Code

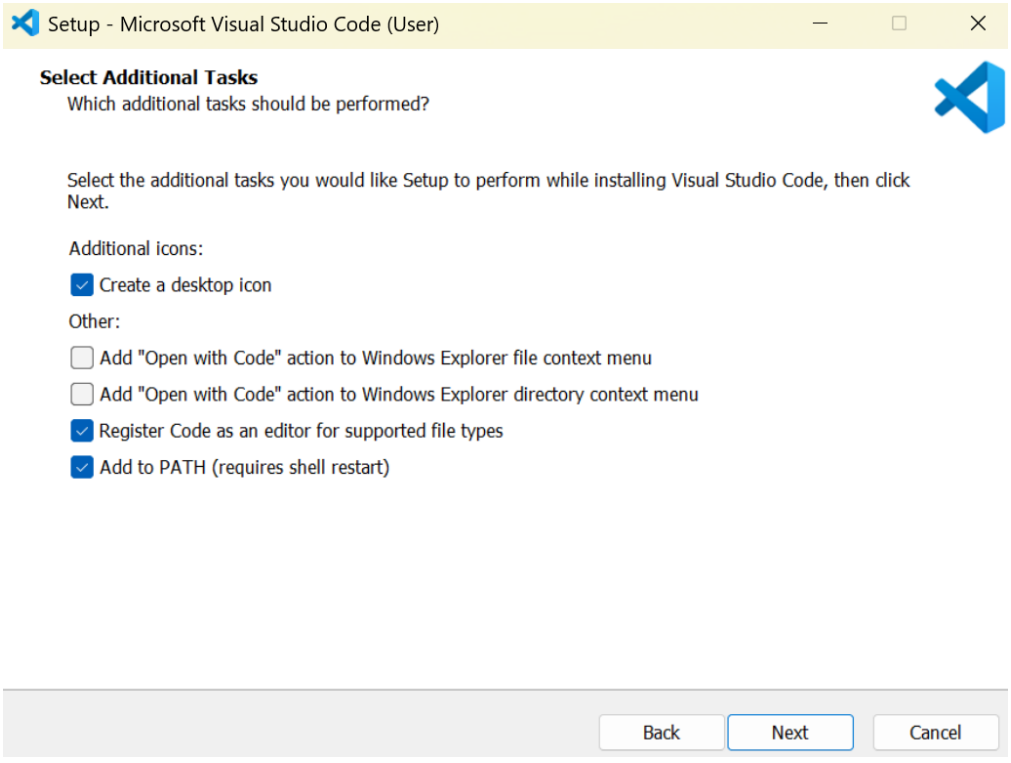
https://code.visualstudio.com/

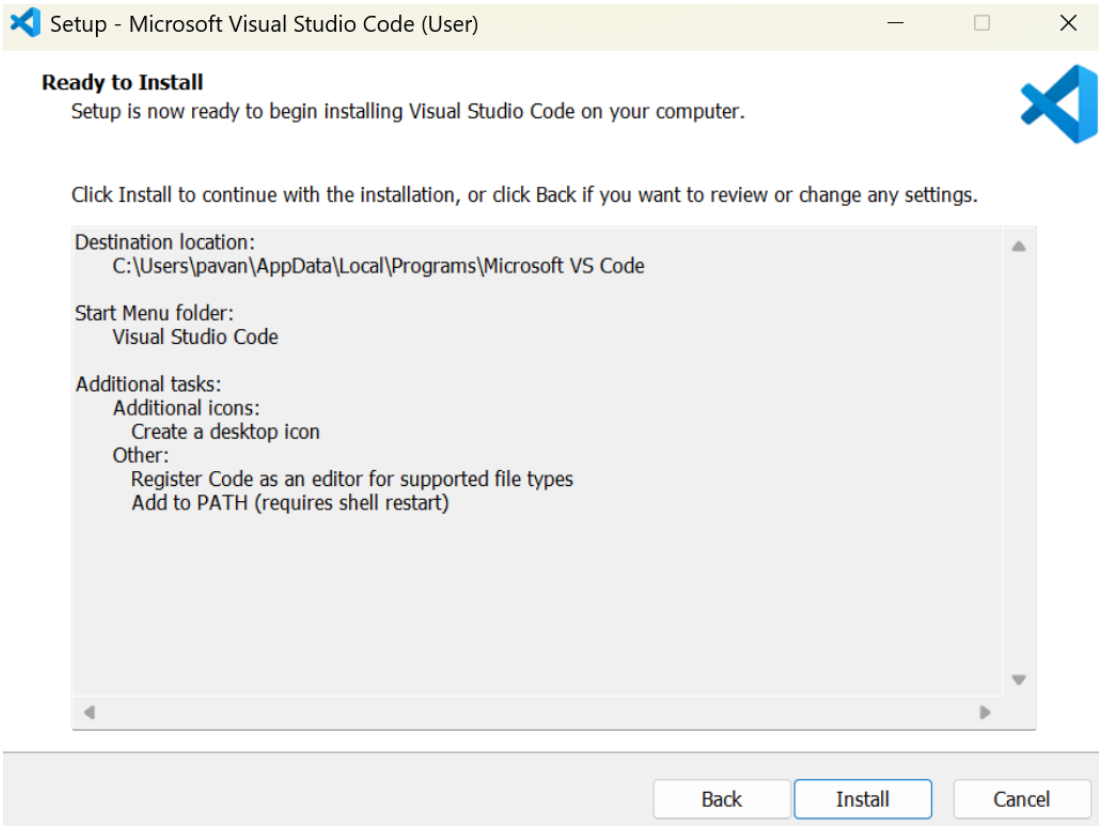

Visual Studio Code
Docs
Updates
Blog
API
Extensions
FAQ
GitHub Copilot
Search Docs
Download
Get GitHub Copilot Free in VS Code!
Your code editor.
Redefined with AI.
Download for Windows
Get Copilot Free
Web, Insiders edition, or other platforms
VSCodeSetup-arm64-1.98.2
.exe

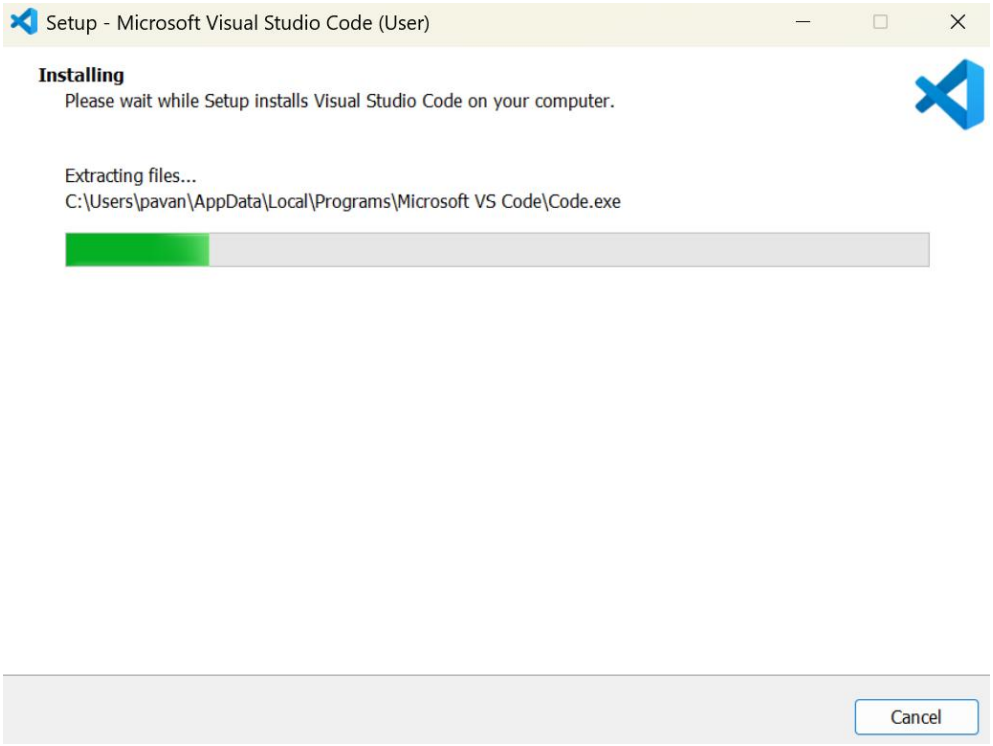

Setup - Microsoft Visual Studio Code (User)
License Agreement
Please read the following important information before continuing.
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.
This license applies to the Visual Studio Code product. Source Code for Visual Studio Code is available at https://github.com/Microsoft/vscode under the MIT license agreement at https://github.com/microsoft/vscode/blob/main/LICENSE.txt. Additional license information can be found in our FAQ at https://code.visualstudio.com/docs/supporting/faq.
MICROSOFT SOFTWARE LICENSE TERMS
MICROSOFT VISUAL STUDIO CODE
I accept the agreement
I do not accept the agreement
Next
Cancel

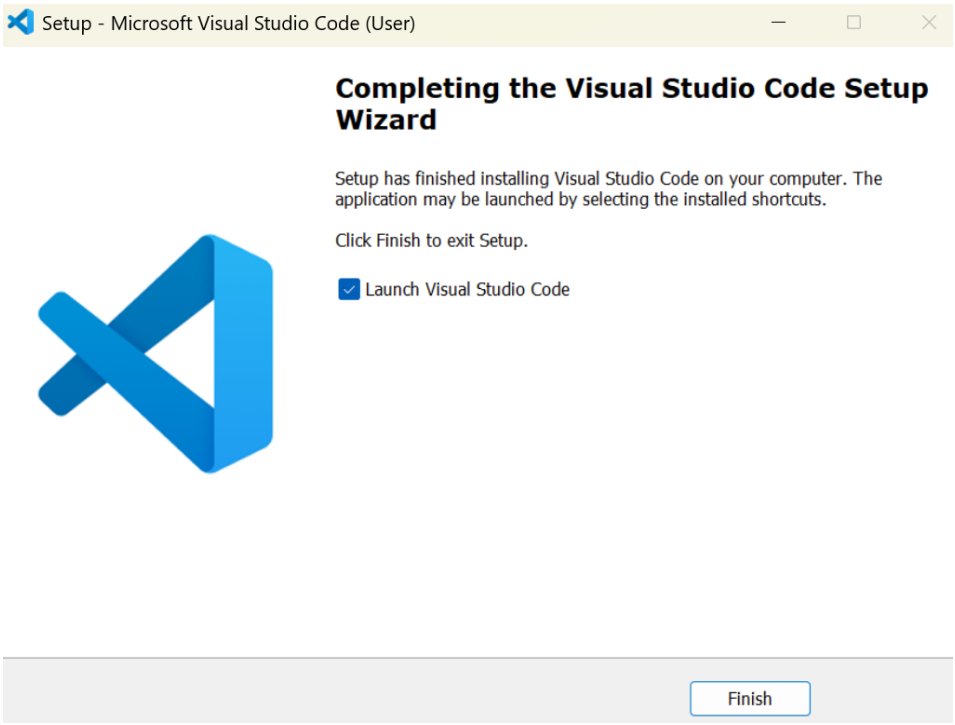

Setup - Microsoft Visual Studio Code (User)
Select Destination Location
Where should Visual Studio Code be installed?
Setup will install Visual Studio Code into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Users\pavan\AppData\Local\Programs\Microsoft VS Code
Browse...
At least 401.9 MB of free disk space is required.
Back
Next
Cancel

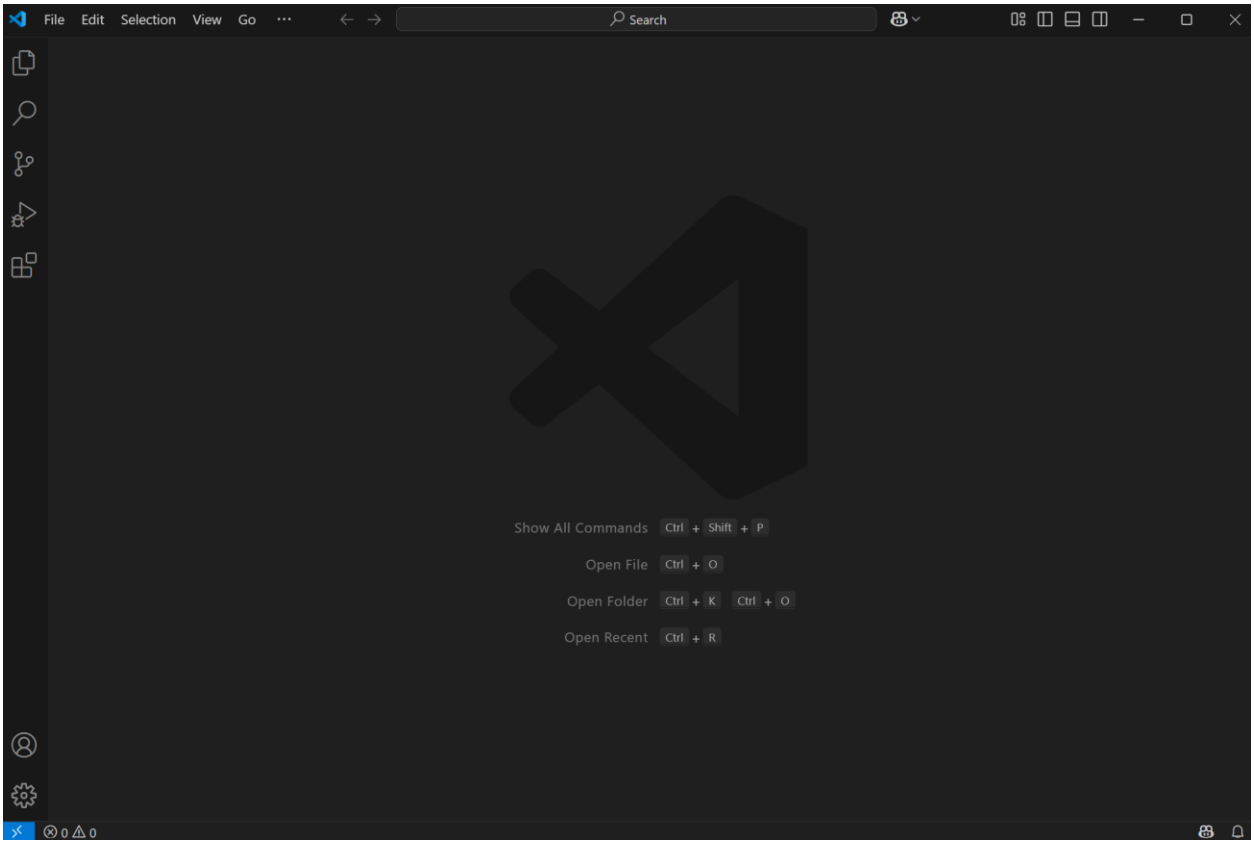

Setup - Microsoft Visual Studio Code (User)
Select Start Menu Folder
Where should Setup place the program's shortcuts?
Setup will create the program's shortcuts in the following Start Menu folder.
To continue, click Next. If you would like to select a different folder, click Browse.
Visual Studio Code
Browse...
Don't create a Start Menu folder
Back
Next
Cancel


Setup - Microsoft Visual Studio Code (User)
Select Additional Tasks
Which additional tasks should be performed?
Select the additional tasks you would like Setup to perform while installing Visual Studio Code, then click Next.
Additional icons:
Create a desktop icon
Other:
Add "Open with Code" action to Windows Explorer file context menu
Add "Open with Code" action to Windows Explorer directory context menu
Register Code as an editor for supported file types
Add to PATH (requires shell restart)
Back
Next
Cancel


Setup - Microsoft Visual Studio Code (User)
Ready to Install
Setup is now ready to begin installing Visual Studio Code on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Destination location:
C:\Users\pavan\AppData\Local\Programs\Microsoft VS Code
Start Menu folder:
Visual Studio Code
Additional tasks:
Additional icons:
Create a desktop icon
Other:
Register Code as an editor for supported file types
Add to PATH (requires shell restart)
Back
Install
Cancel


Setup - Microsoft Visual Studio Code (User)
Installing
Please wait while Setup installs Visual Studio Code on your computer.
Extracting files...
C:\Users\pavan\AppData\Local\Programs\Microsoft VS Code\Code.exe
Cancel


Setup - Microsoft Visual Studio Code (User)
Completing the Visual Studio Code Setup Wizard
Setup has finished installing Visual Studio Code on your computer. The application may be launched by selecting the installed shortcuts.
Click Finish to exit Setup.
Launch Visual Studio Code
Finish


File Edit Selection View Go
Search
Show All Commands Ctrl + Shift + P
Open File Ctrl + O
Open Folder Ctrl + K Ctrl + O
Open Recent Ctrl + R