

## Angular

Angular is a **TypeScript-based** open-source framework developed by **Google** for building **client-side (front-end)** applications, especially **single-page applications (SPAs)**.

### Angular is used for:

- Creating dynamic web pages that run in the **browser**
- Building **user interfaces (UIs)**
- Managing **user interactions and views**
- Consuming **APIs** from a back-end server

Cannot directly accessing a **database, managing server. So we need a back-end** tools/frameworks like:

- **Node.js / Express**
- **Django (Python)**
- **Spring Boot (Java)**
- **ASP.NET (C#)**

Full stack (front-end + back-end) architecture

VS Code for Angular (and front-end) development:

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### ✓ 1. Excellent TypeScript Support

Angular is written in **TypeScript**, and VS Code has **built-in TypeScript support**:

- Syntax highlighting
  - Type checking
  - IntelliSense (auto-completion)
  - Error detection as you type
- 

### ✓ 2. Angular-Specific Extensions

You can install extensions like:

- **Angular Language Service** – helps with smart autocompletion in templates
- **Angular Snippets** – faster coding with boilerplate shortcuts
- **Prettier / ESLint** – for code formatting and linting

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### ✔ 3. Integrated Terminal

You can run Angular CLI commands (`ng serve`, `ng generate`, etc.) right inside the editor without switching windows.

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### ✔ 4. Debugging Tools

VS Code allows:

- Breakpoint debugging in TypeScript and browser
  - Chrome/Edge debugging extensions for Angular apps
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### ✔ 5. Git Integration

Built-in version control lets you:

- See code changes
- Commit & push with Git/GitHub easily
- Manage branches

## Installation Procedure:

### Download Node.js software (LTS)

Note: base of all java script like java.

**While Installation of Node.js npm (Node Package Manager) also installed.**

### Verify the Node installation using CMD

```
C:\Users\CSA>node --version (OR) node -v
```

```
v22.15.1
```

**Note: Work in node.js terminal**

```
C:\Users\CSA>node
```

```
Welcome to Node.js v22.15.1.
```

```
Type ".help" for more information.
```

```
> 3>4
```

```
false
```

```
> 1+5
```

```
6
```

```
C:\Users\CSA>npm --version
```

```
10.9.2
```

```
C:\Users\CSA>npm i -g @angular/cli
```

**Note:** i -> Install, -g -> for execute cmd from any directory in cmd like set java path

**Result:**

```
added 274 packages in 44s
```

```
52 packages are looking for funding ( Note: some packages need financial support)
```

```
run `npm fund` for details
```

**In CMD**

```
D:\>cd Angular-App
```

```
D:\Angular-App>ng new ProjectName Note: ng new – Creates a new Angular project.
```

```
Would you like to share pseudonymous usage data about this project with the Angular Team  
at Google under Google's Privacy Policy at https://policies.google.com/privacy. For more  
details and how to change this setting, see https://angular.dev/cli/analytics.
```

```
(y/N) No
```

```
Global setting: disabled
```

```
Local setting: No local workspace configuration file.
```

```
Effective status: disabled
```

? Which stylesheet format would you like to use?

> CSS [ <https://developer.mozilla.org/docs/Web/CSS> ] ( Note: Select CSS)

Sass (SCSS) [ <https://sass-lang.com/documentation/syntax#scss> ]

Sass (Indented) [ <https://sass-lang.com/documentation/syntax#the-indented-syntax> ]

Less [ <http://lesscss.org> ]

Do you want to enable Server-Side Rendering (SSR) and Static Site Generation (SSG/Prerendering)? (y/N)  
**Yes**

Would you like to use the Server Routing and App Engine APIs (Developer Preview) for this server application? **Yes**

**Note:** @angular/cli refers to the **Angular Command Line Interface (CLI)** — a tool provided by the Angular team to help developers create, build, and manage Angular applications

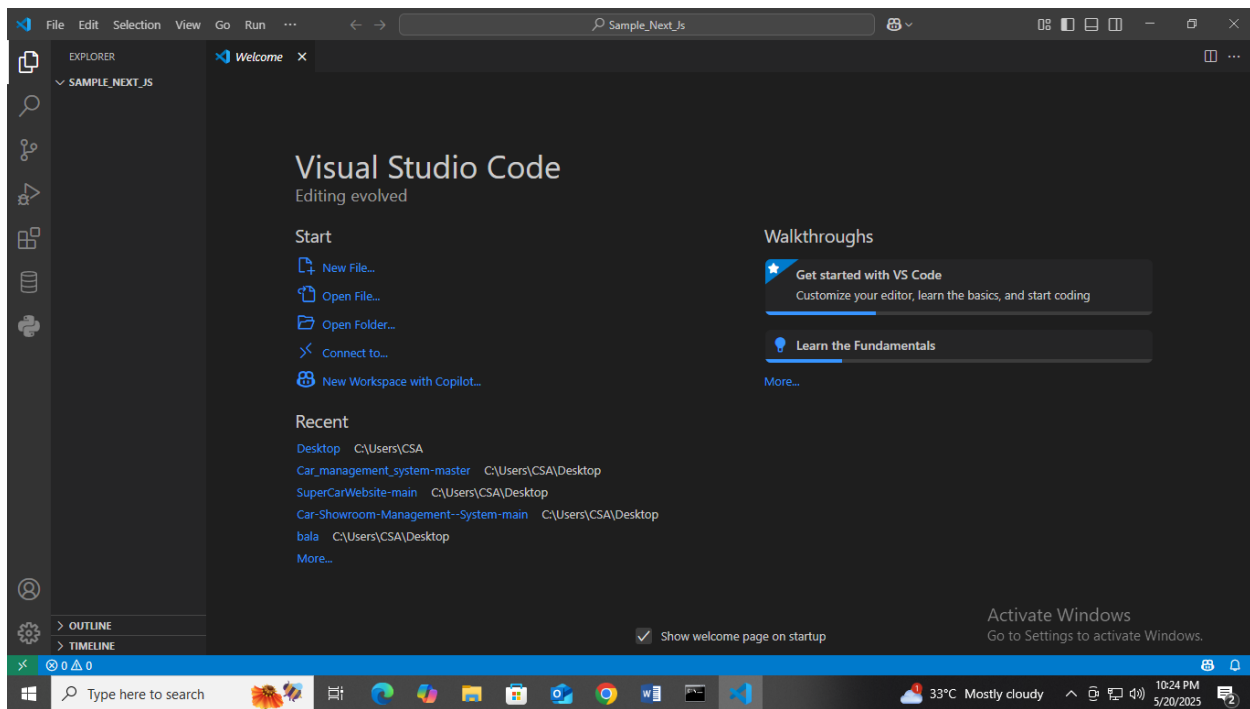
Download all packages

```
Select C:\Windows\system32\cmd.exe
√ Which stylesheet format would you like to use? CSS [ https://developer.mozilla.org/docs/Web/CSS ]
√ Do you want to enable Server-Side Rendering (SSR) and Static Site Generation (SSG/Prerendering)? Yes
√ Would you like to use the Server Routing and App Engine APIs (Developer Preview) for this server application? Yes
CREATE ProjectName/angular.json (2867 bytes)
CREATE ProjectName/package.json (1245 bytes)
CREATE ProjectName/README.md (1534 bytes)
CREATE ProjectName/tsconfig.json (942 bytes)
CREATE ProjectName/.editorconfig (331 bytes)
CREATE ProjectName/.gitignore (629 bytes)
CREATE ProjectName/tsconfig.app.json (588 bytes)
CREATE ProjectName/tsconfig.spec.json (449 bytes)
CREATE ProjectName/.vscode/extensions.json (134 bytes)
CREATE ProjectName/.vscode/launch.json (490 bytes)
CREATE ProjectName/.vscode/tasks.json (980 bytes)
CREATE ProjectName/src/main.ts (256 bytes)
CREATE ProjectName/src/index.html (310 bytes)
CREATE ProjectName/src/styles.css (81 bytes)
CREATE ProjectName/src/main.server.ts (271 bytes)
CREATE ProjectName/src/server.ts (1702 bytes)
CREATE ProjectName/src/app/app.component.html (20239 bytes)
CREATE ProjectName/src/app/app.component.spec.ts (960 bytes)
CREATE ProjectName/src/app/app.component.ts (299 bytes)
CREATE ProjectName/src/app/app.component.css (0 bytes)
CREATE ProjectName/src/app/app.config.ts (447 bytes)
CREATE ProjectName/src/app/app.routes.ts (80 bytes)
CREATE ProjectName/src/app/app.config.server.ts (509 bytes)
CREATE ProjectName/src/app/app.routes.server.ts (174 bytes)
CREATE ProjectName/public/favicon.ico (15086 bytes)
√ Packages installed successfully.
'git' is not recognized as an internal or external command,
operable program or batch file.

D:\Angular-App>
```

Activate Windows  
Go to Settings to activate Windows.

Now Open Project using VS Code.



(Or)

Goto CMD -> D:\Angular-App>code .ProjectName

Press-> Ctrl + ` (backtick key) to opens and closes the **integrated terminal in Visual Studio Code**.

PS C:\Users\CSA> d:

PS D:\> cd Angular-App

PS D:\Angular-App> ng serve

**Error:** ng : File C:\Users\CSA\AppData\Roaming\npm\ng.ps1 cannot be loaded because running scripts is disabled on this system. For more information, see about\_Execution\_Policies at

<https://go.microsoft.com/fwlink/?LinkID=135170>.

At line:1 char:1

+ ng serve

+ ~~

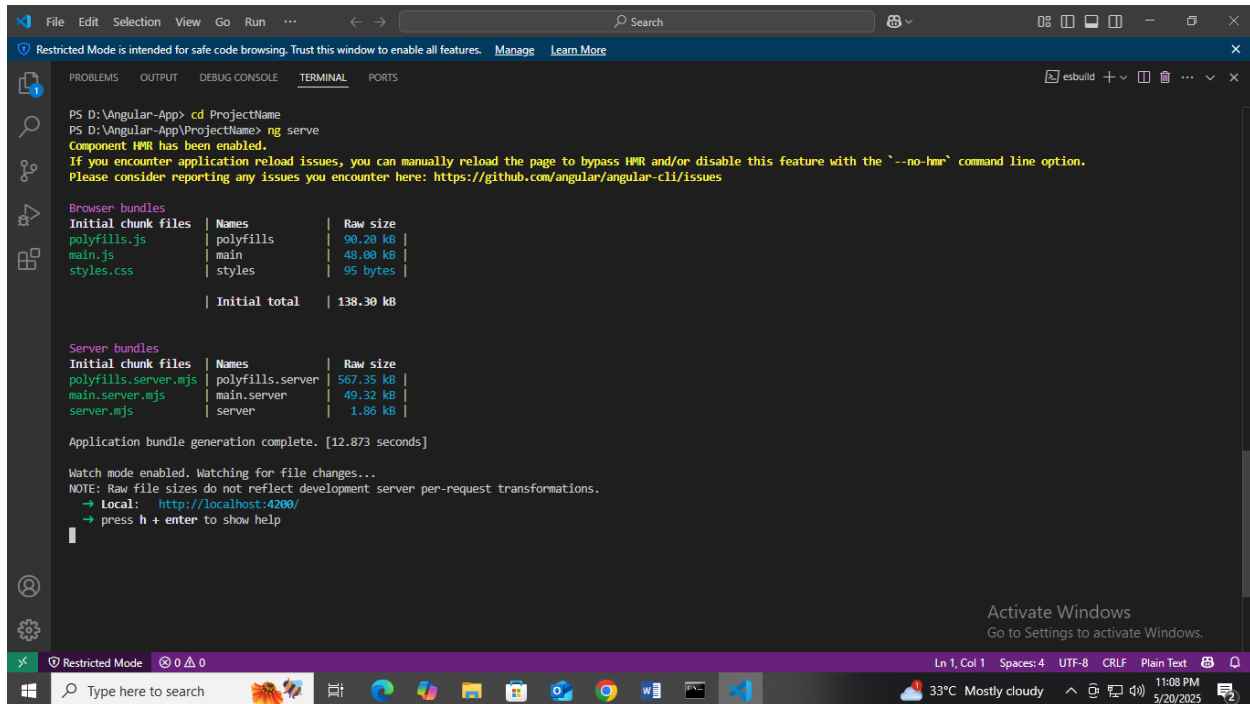
+ CategoryInfo : SecurityError: (:) [], PSSecurityException

+ FullyQualifiedErrorId : UnauthorizedAccess

**Solution:** To run the following command to execute cli command in this terminal

Set-ExecutionPolicy -Scope CurrentUser -ExecutionPolicy RemoteSigned

PS D:\Angular-App> ng serve



```
PS D:\Angular-App> cd ProjectName
PS D:\Angular-App\ProjectName> ng serve
Component HMR has been enabled.
If you encounter application reload issues, you can manually reload the page to bypass HMR and/or disable this feature with the '--no-hmr' command line option.
Please consider reporting any issues you encounter here: https://github.com/angular/angular-cli/issues

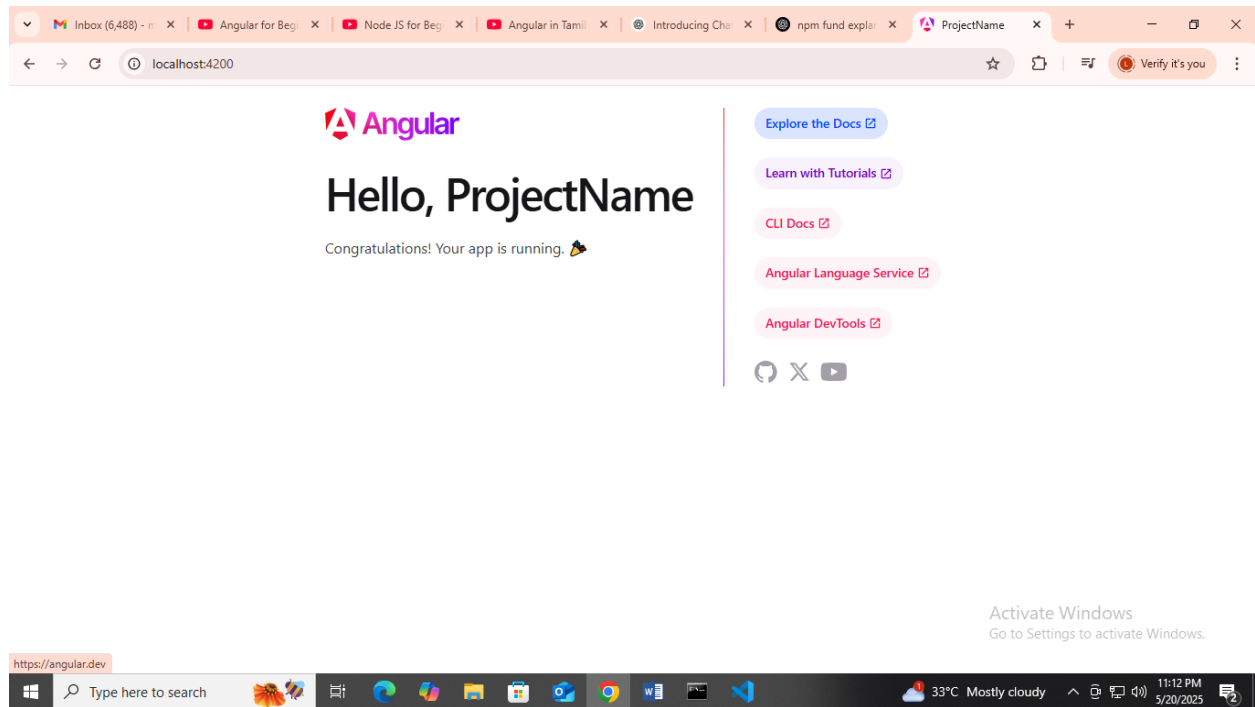
Browser bundles
Initial chunk files | Names | Raw size
polyfills.js | polyfills | 90.20 kB |
main.js | main | 48.00 kB |
styles.css | styles | 95 bytes |
| Initial total | 138.30 kB |

Server bundles
Initial chunk files | Names | Raw size
polyfills.server.mjs | polyfills.server | 567.35 kB |
main.server.mjs | main.server | 49.32 kB |
server.mjs | server | 1.86 kB |

Application bundle generation complete. [12.873 seconds]

Watch mode enabled. Watching for file changes...
NOTE: Raw file sizes do not reflect development server per-request transformations.
→ Local: http://localhost:4200/
→ press h + enter to show help
```

Output View in the link shown in the Terminal -> Local: <http://localhost:4200/>



### Note: Shortcuts in VS Code Terminal

press `r` + enter to force reload browser

press `u` + enter to show server url

press `o` + enter to open in browser

press `c` + enter to clear console

press `q` + enter to quit

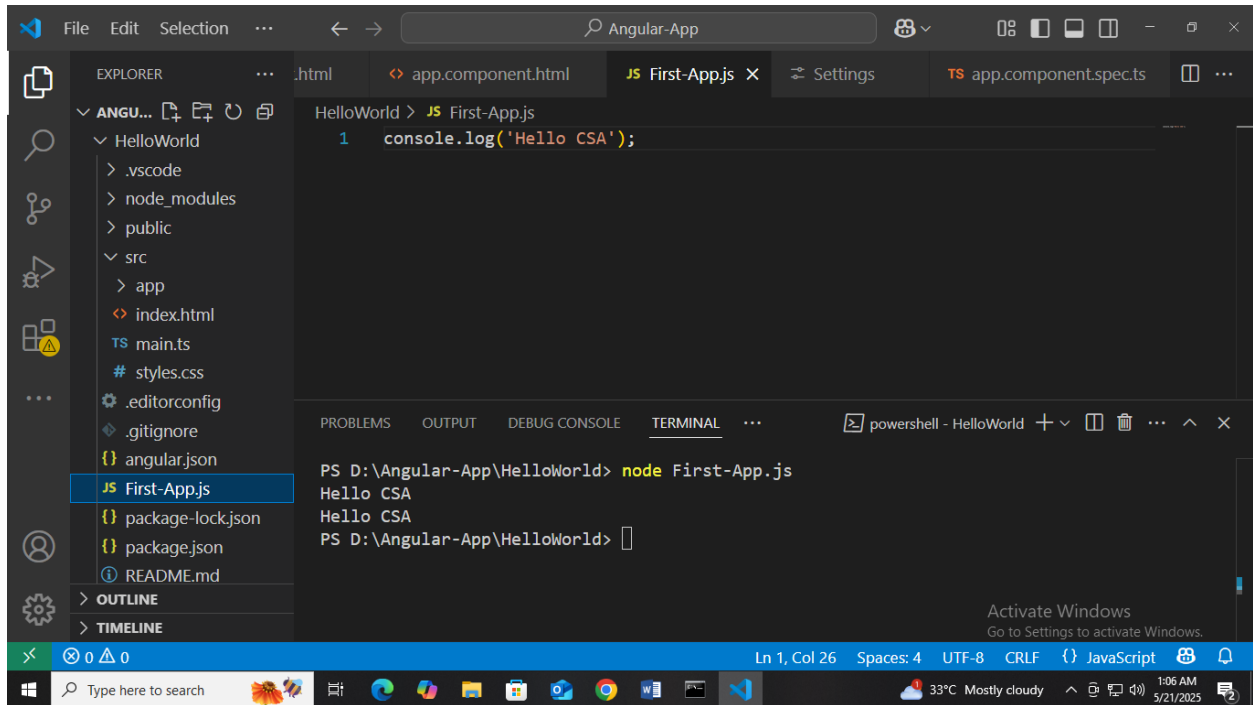
### Browser

Use any browser using above mentioned port

Without Refresh your browser, Output has changed at the time of file change and save. This is the feature of On Module Replacement.

## Node JS

Open Project -> Create a New File -> File Name.js



The screenshot shows the Visual Studio Code interface with a project named 'Angular-App'. The Explorer sidebar on the left shows the file structure, including a folder 'HelloWorld' containing files like '.vscode', 'node\_modules', 'public', 'src', 'app', 'index.html', 'main.ts', 'styles.css', 'editorconfig', 'gitignore', 'angular.json', 'First-App.js', 'package-lock.json', 'package.json', and 'README.md'. The 'First-App.js' file is selected and open in the editor, showing the following code:

```
1 console.log('Hello CSA');
```

The terminal at the bottom shows the command 'node First-App.js' being executed, resulting in the output 'Hello CSA' being printed twice. The status bar at the bottom indicates the current line is 1, column 26, with 4 spaces, using UTF-8 encoding and CRLF line endings. The system tray at the bottom shows the date and time as 1:06 AM on 5/21/2025.

Run in Terminal using the command

node First-App.js

Hello CSA



