Introduction to Angular & Setup

1.1 What is Angular & Why It's Used?

◆ Angular is a TypeScript-based front-end framework maintained by Google for building single-page applications (SPAs).

W Key Features:

- Component-based: UI is split into reusable components.
- Two-way Data Binding: Syncs data between model (TypeScript) and view (HTML).
- Dependency Injection: Manages services and shared logic efficiently.
- **Directives**: Add dynamic behavior to HTML (nglf, ngFor).
- **Pipes**: Transform data in templates (date , currency).
- **RxJS Support**: Reactive programming with Observables.
- **Routing**: Build multi-page navigation inside a single-page app.
- Cross-Platform: Build Web, Mobile (with Ionic), and Desktop apps.

Why it's used?

- Enterprise-grade applications (Google, Microsoft, Upwork use it).
- Strong community & Google support.
- Scalable for large projects.
- Efficient change detection for faster apps.
- ★ Example real-world use:
- Gmail is an Angular SPA → dynamic navigation, no full page reloads.

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1.2 Install Node.js + Angular CLI

Angular requires **Node.js** (JavaScript runtime) and **npm** (Node package manager).

Step 1: Install Node.js

- 1. Download from: https://nodejs.org
 - LTS version (recommended) (Long-Term Support, stable).
- 2. Install \rightarrow it also installs **npm**.
- ∇erify installation:

```
node -v
npm -v
```

Step 2: Install Angular CLI (Command Line Interface)

Angular CLI is the official tool to create, build, test, and deploy Angular apps.

Run:

```
npm install -g @angular/cli
```

Verify:

ng version

You'll see Angular CLI + Node.js + npm versions.

1.3 Create First Angular Project

1. Navigate to the folder where you want the project:

2

```
cd Desktop

1. Create new project:
```

ng new my-app

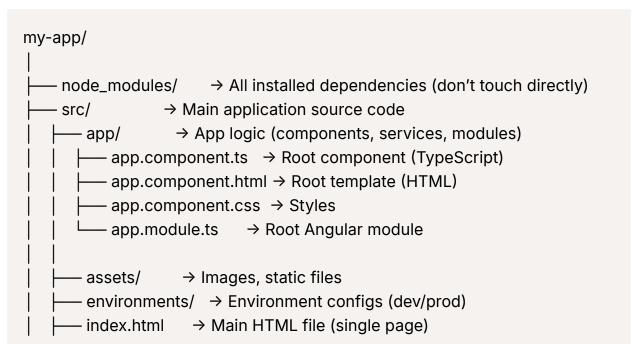
1. CLI asks:

- Add Angular routing? → Yes (for navigation support).
- Which stylesheet format? → CSS (or SCSS/SASS/LESS if preferred).
- 2. Go inside project:

cd my-app

1.4 Angular Project Structure Explained

Inside my-app/ you'll see:



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```
      Image: project configuration angular.json
      → Angular project configuration

      Image: project configuration angular.json
      → Project dependencies & scripts

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      Image: project configuration angular.json
      → Project info
```

★ How Angular loads?

- index.html → loads <app-root>
- <app-root> comes from app.component.html
- Bootstrapped via main.ts → AppModule → AppComponent

1.5 Running & Building Angular Applications

Run Development Server

ng serve			
or			

ng serve -o

(-o opens in browser automatically at http://localhost:4200)

Now, any code changes auto-refresh in browser (Hot Reload).

Build for Production

ng build

- Creates dist/ folder with optimized files (minified, tree-shaken).
- These files can be deployed to a server (Apache, Nginx, Firebase, etc.).

ng build --prod

(Optimized build for production, smaller and faster).