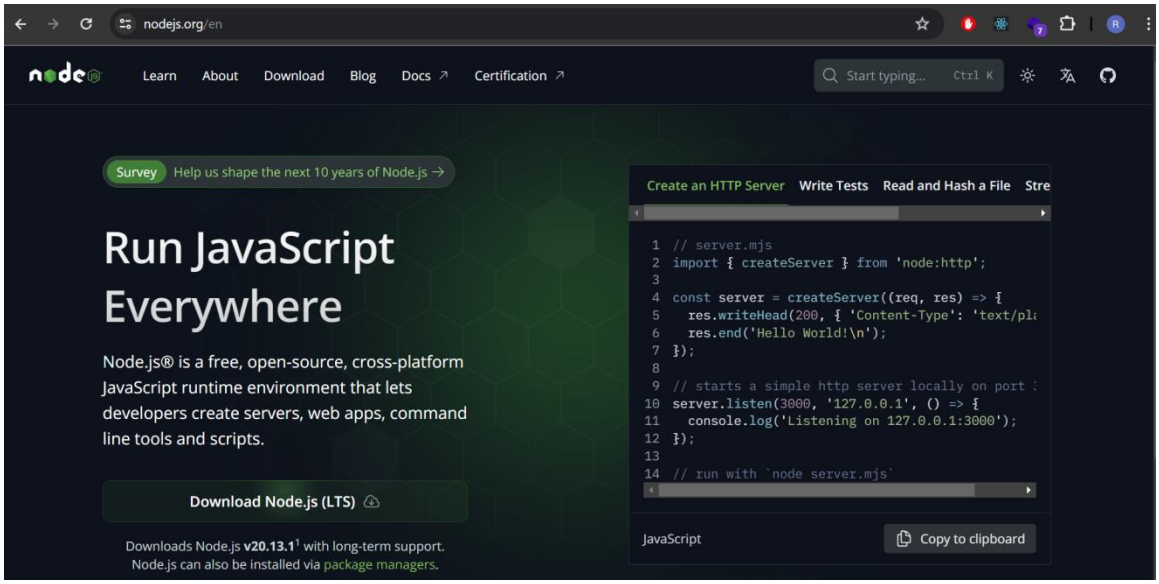
In order to install Angular you need to have latest/stable version of Node.js. Go to the official website in order to install Node.js on your machine locally.

Make sure that Node.js version you intall is the current one or latest stable version. Just click 'Download Node.js(LTS)' button and it will start downloading the package on your machine.



Once downloaded click on the icons downloaded and follow the steps, till the installation is completed. To check the version installed of Node.js you can use the following command in a terminal/console window. —

```
node -v
```

Need for NPM for Angular development

As Node.js serves as Run time environment for the application, similarly NPM(node package manager) is used as a dependency management tool for any JavaScript application. NPM will allow us to install the libraries required for any Angular package application;
for example angular-router, angular-http, bootstrap, and many more.

Note: Once you have installed Node.js it will automatically install NPM on your machine, and you can check the version installed using the below command.

```
npm -v
```

System Requirement to Install Angular for Windows

Before embarking on the journey to install angular in windows, it's imperative to ensure that your system meets the necessary prerequisites for Angular development.

A. Hardware Requirements

Angular, being a sophisticated framework, doesn't demand extravagant hardware. A standard Windows PC or laptop with a reasonably fast processor and at least 8GB of RAM is generally suitable for Angular development. However, for larger projects, consider upgrading to 16GB or more.

B. Software Requirements

The backbone of Angular development is Node.js. Make sure to have the latest version of Node.js installed on your Windows machine. Angular relies on Node.js for package management, server-side functionality, and running scripts.

C. Additional libraries or tools to be installed in prior (if any)

Depending on the specific requirements of your project, you might need additional tools or libraries. Some projects may require specific versions of Node.js or additional packages. Ensure that you review your project documentation for any such prerequisites.

This will ensure that we have a system that will be able to install angular for windows.

What is Angular CLI?

Earlier in the initial days of Angular, developers used to create whole architecture, webpack files, build process, etc for any project on their own from scratch which was quite a time-consuming and lengthy process. To make it easier for the developer, Angular team come up with the easy-to-use tool named Angular CLI.

As the name suggests CLI (command line interface) provides a user (developer) friendly interface where you can run commands to make your development life easier and faster.

Angular CLI comes with a number of commands available to use from creating a new project, to creating components, creating a routing configuration file, services, and many more.

How to Install Angular on Windows? Step-by-Step

Now, let's delve into the comprehensive step-by-step process to install Angular in windows machine:

Step 1: Installing Node.js

Begin by visiting the official Node.js website (https://nodejs.org/) and downloading the installer.

Follow the on-screen instructions to complete the installation.

Once installed, open a command prompt and verify Node.js and npm (Node Package Manager) installation by running the following commands:

```
node -v

npm -v
```

This ensures that Node.js is installed and accessible from the command line.

Step 2: Installing Angular CLI

With Node.js successfully installed, you can proceed to install Angular CLI (Command Line Interface) using npm. Open a command prompt and run the following command:

To install the Angular CLI on your machine, open the terminal window and run the following command:

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

where -g denotes that CLI is being installed globally to your machine, which means you can create or run any command of CLI anywhere on your machine. Once you run the above command CLI will be installed on your machine, and you can verify the version installed using the following command:

```
ng version
```

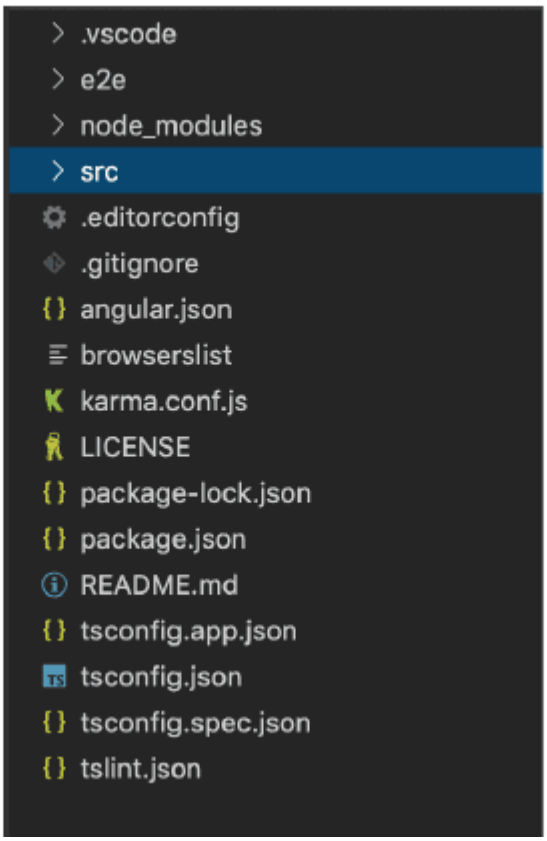
Step 3: Creating a Project using Angular CLI

Now, let's create our first ever Angular project using Angular CLI. Open your terminal window and type the command below on your machine.

```
ng new hello-world
```

Here ng is our CLI prefix, new denotes that we are creating a new project and hello-world is our project name. You can choose any name you want.

After running this command you will find the full architecture of the project in the directory where you run this command. The project folder will be something like below in the image -



Step 4: Angular Project Architecture

The first file to render on running this application will be index.html which present in the src folder.

- src folder contains Source files for the root-level application project.
- assets folder contains all the static assets like images, fonts, etc.
- node_modules This folder is created while you run npm installby package manager (npm) and it contains all the project dependencies or any third party modules required for the project.
- e2e folder contains all the source code related to Test Cases.You can customise it as per your requirements.
- README.md file is being used as documentation for the app.
- Package.json configures NPM dependencies which are available for the project in the workspace along with their versions specified.

One with the installation process of Angular application via CLI, it's time to run the application locally. Angular CLI comes with complete tool-chain/commands for the development of front-end applications on your machine.

Run the following command on the terminal (Navigate to the project directory if you are not in that directory).

```
ng serve
```

or

```
ng serve --open
```

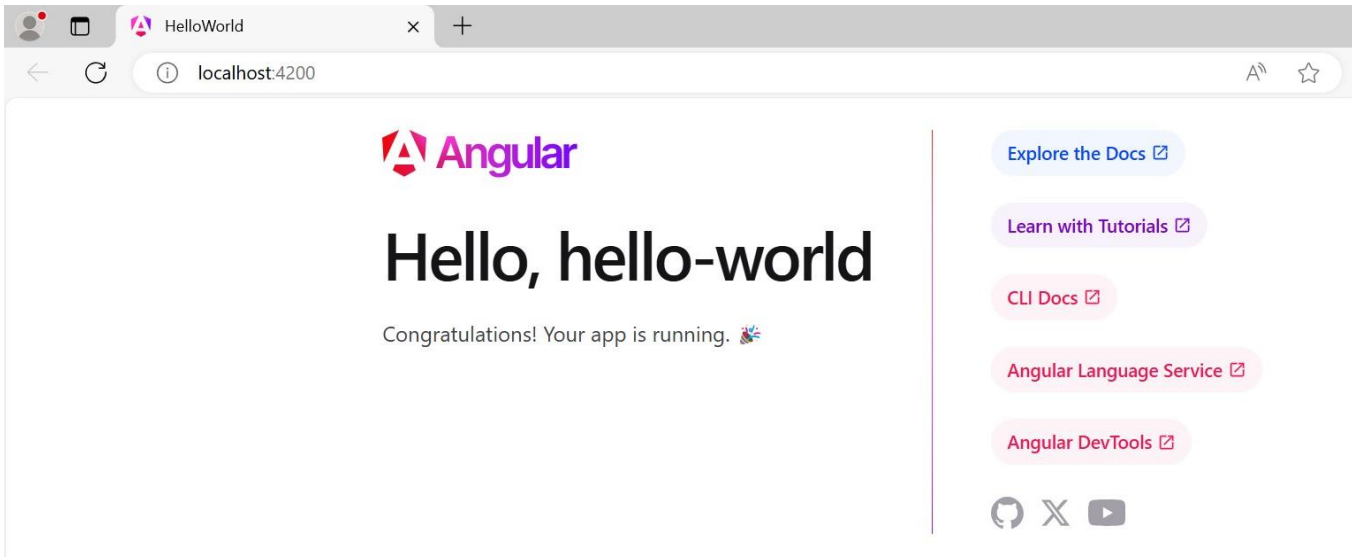
How to Test If Angular Installation in Windows is Properly Done:

The --open (or just -o) option automatically opens your browser to http://localhost:4200/.

ng serve command will serve your application on localhost server which you can check by navigating to your browser with the below URL http://localhost:4200/. You can customise the port as per your requirement.

Accessing Angular Web Interface

ng serve command may take a few seconds to run your application, and once completed, you should see a web page similar to the following.



And we are done!
Now you can make changes in the default component's template which is app.component.html .

How to Use Angular:

Now that Angular is installed, I will take you through understanding some basic concepts and usage of important blocks of angular that will help us understand the Angular ecosystem and build our knowledge on it.

A. Creating a Component

Components are the building blocks of an Angular application.
Components are fundamental building blocks that encapsulate specific functionality and user interface elements within a web application.

A component in Angular is a TypeScript class that interacts with a corresponding HTML template and optional CSS styles. It follows a modular, reusable, and maintainable approach to structuring web applications.

Components in Angular follow a hierarchical structure, allowing for the composition of larger applications by combining smaller, self-contained components. This modular approach enhances code organization, reusability, and maintainability, facilitating collaborative development efforts.

Run the following command to generate a new component:

```
ng generate component my-component
```

This command creates the necessary files for an Angular component, including TypeScript, HTML, and CSS files.

B. Running Tests

Angular provides robust testing capabilities. Run the following command to execute tests:

```
ng test
```

This will run the tests defined in your project and provide feedback on their success or failure.

C. Exploring Angular Modules

Angular applications are modular. module is a logical container that groups related components, directives, pipes, and services, defining the boundaries and organization of an application. Modules help in organizing code, encapsulating functionality, and facilitating the reusability of components across different parts of an application. Each Angular application has at least one module, the root module, which serves as the starting point for the application's execution. Additional modules can be created to organize and manage different features or sections within the application.

You can create a new module using the following command:

```
ng generate module my-module
```

Understanding how to organize and utilize modules is crucial for scalable and maintainable Angular applications.

D. Utilizing Angular Services

In Angular, services play a crucial role in promoting modularity, encapsulating business logic, and facilitating the sharing of data and functionality across different components. Services are singleton objects that are instantiated once and can be injected into various components or other services within an Angular application.