Phoenix
one
The Knowledge Institute

ANGULAR 2 FUNDAMENTALS

December 13, 2017

GETTING TO KNOW

- Name
- Background
  - School
  - Degree
  - Work Experience
  - Role / Position
- Expectations

GROUND RULES

- Start on time. Stay on time. Stop on time.
- Participate in the discussion, ask questions
- Attendance is important
- Cell phones on silent

RESOURCES

- https://github.com/jamesallanto/angular
- Credits:
  - Google for Angular
  - Angular Cli
  - Maximilian Schwarzmuller

ANGULAR

COURSE INTRODUCTION

- AWESOME FRONT END WEB APPLICATIONS
- REACTIVE WEB APPLICATIONS WITH GREAT USER EXPERIENCES
- BUILDING BLOCKS OF ANGULAR
- BUILD A PROJECT

WHAT IS ANGULAR?

WHAT IS ANGULAR?

- Angular is a JavaScript Framework which allows you to create reactive Single-Page-Applications (SPAs).
- Reactive means the experience is fast and dynamic without loading the whole page.
- Data is loaded in the background
- JavaScript changes the dom (Document Object Model), changes whatever is displayed in the HTML code during runtime.

ANGULAR 5 VS ANGULAR 4 VS ANGULAR 2 VS ANGULAR

- ANGULAR JS OR ANGULAR ONE WAS RELEASE IN OCT 2010
- ANGULAR 2 IS A COMPLETE REWRITE OF ANGULAR 1 IT IS THE FIRST RELEASE OF ANGULAR
- ANGULAR 3 WAS SKIPPED DUE TO VERSION CONFLICTS
- ANGULAR 4 THEN NOW ANGULAR 5
- ANGULAR 5 IS THE LATEST VERSION AND DID NOT INTRODUCE BREAKING CHANGES TO ANGULAR 4 AND ANGULAR 2
- ANGULAR 2 CAN EASILY BE UPGRADED TO ANGULAR 5

WHY ANGULAR?

- Built for speed, each release gets faster
- Modern (uses ECMAScript standard)
- Simplified API
- Enhances productivity
- Takes mobile applications in mind (Ionic)

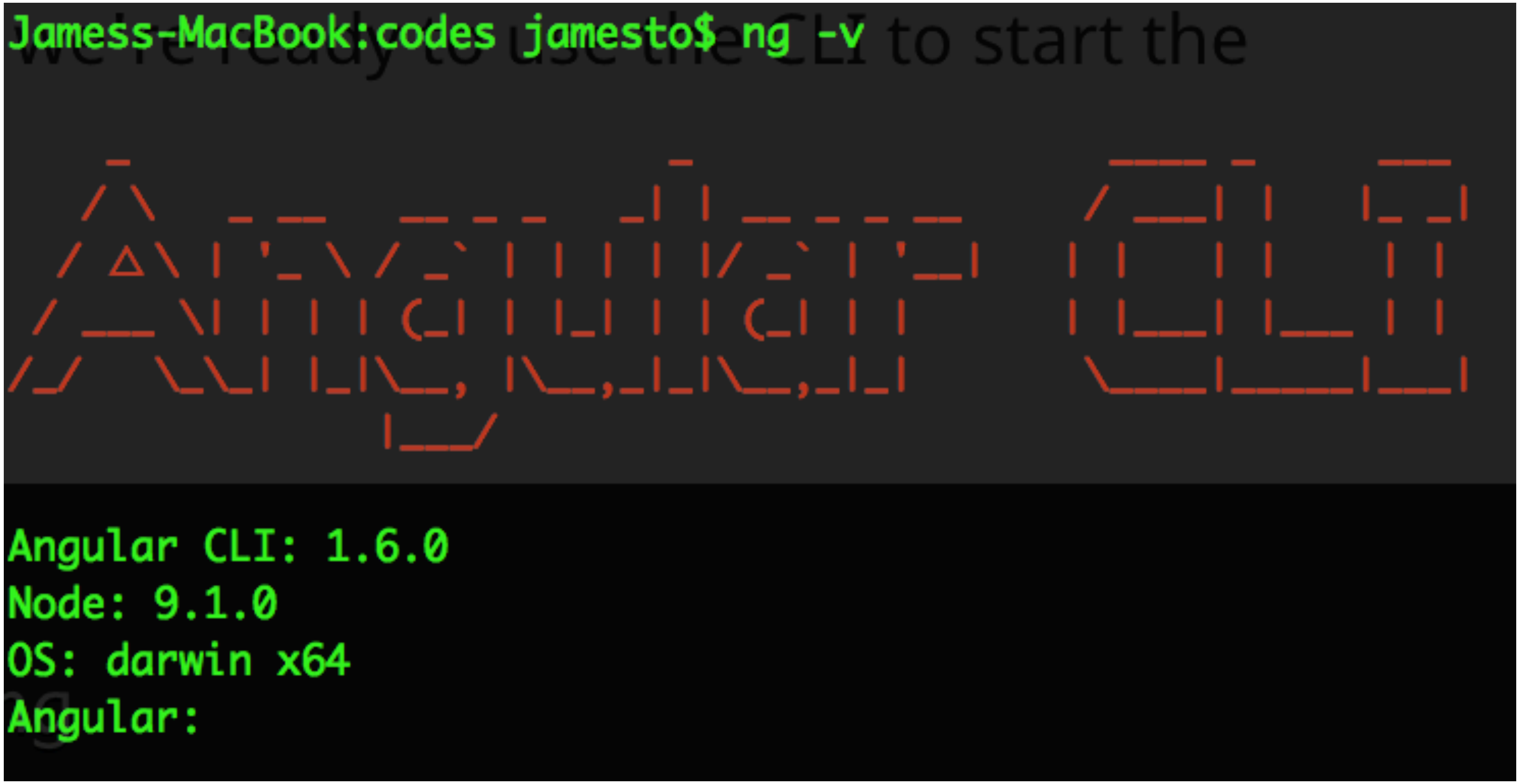
INSTALLATION

INSTALLATION OVERVIEW

- DOWNLOAD LATEST INSTALLER FROM https://nodejs.org/en/
- Run installer
- Follow prompts (Accept license agreement, click next, and accept default installation settings)
- Restart computer
- Test installation
  - node -v
  - npm -v

INSTALL ANGULAR CLI

- ➤ npm install -g @angular/cli
- ➤ ng -v



```
Jamess-MacBook:codes jamesto$ ng -v

    _                      _                 ____ _     ___
   / \   _ __   __ _ _   _| | __ _ _ __     / ___| |   |_ _|
  / △ \ | '_ \ / _` | | | | |/ _` | '__|   | |   | |    | |
 / ___ \| | | | (_| | |_| | | (_| | |      | |___| |___ | |
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               |___/

Angular CLI: 1.6.0
Node: 9.1.0
OS: darwin x64
Angular:
```

TYPESCRIPT

Working files: basics folder

WHAT IS TYPESCRIPT?

- Typescript is a superset of JavaScript
- It compiles to plain JavaScript
- Offers more features than plain Javascript:
  - Classes
  - Interfaces
  - Strong Typing
- It allows you to write a much more robust code which gets checked during writing and not just during running
- A lot of features only exists in Typescript and Angular is meant to be used with Typescript.

USING TYPES (TYPING.TS)

Variables:

let myString: string; (‘let’ keyword to create a variable)

Assignment:

myString = ‘This is a string’;

Inferring Types:

let anotherString = ‘another string’

Other basic types:

- string, number, boolean, Array<string>, any

CLASSES (CLASSES.TS)

- Class keyword
- Recent specification of JavaScript now supports class keyword
- Automatically converts to plain old JavaScript
- Class is a blue print of the object that will be created later on
- Private keyword
- Static keyword

INTERFACES (INTERFACES.TS)

- Interfaces are like contracts
- Stated attributes are required unless otherwise stated
- Allows us to create a secure form of communication between several objects
- Sample is OnInit interface
- Safely tell our objects that they can safely access certain properties or methods
- Create our own type with our creating a class

GENERICS (GENERICS.TS)

- Not really used often
- Allow us to become flexible regarding the types and objects used.
- Are types that can hold/ use several types

MODULES (MODULES.TS)

- Export keyword allows us to use the class in other files

TO LEARN MORE ABOUT TYPESCRIPT

http://www.typescriptlang.org/docs/home.html

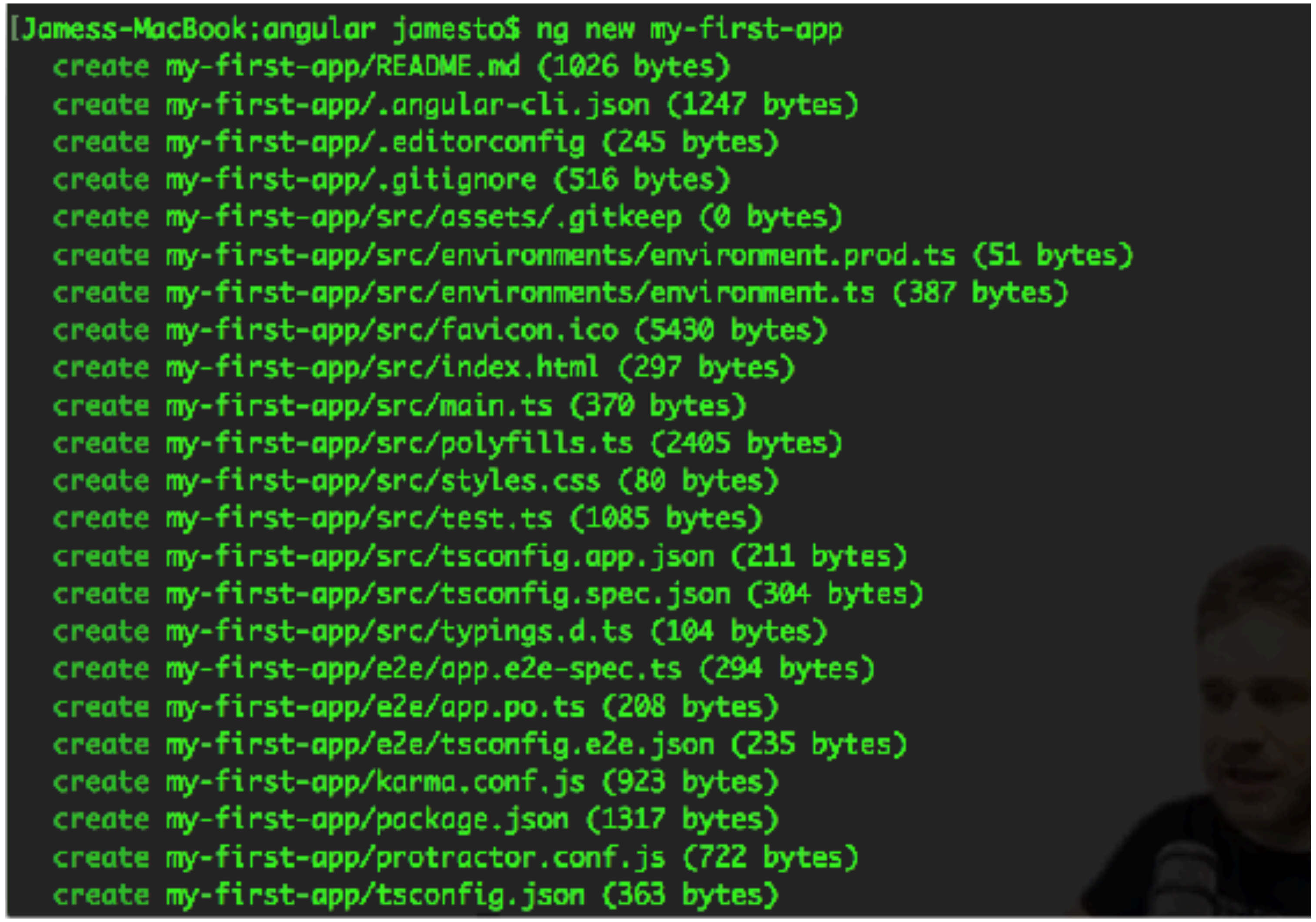
ANGULAR FIRST APP

FIRST_APP (CHECK GITHUB)

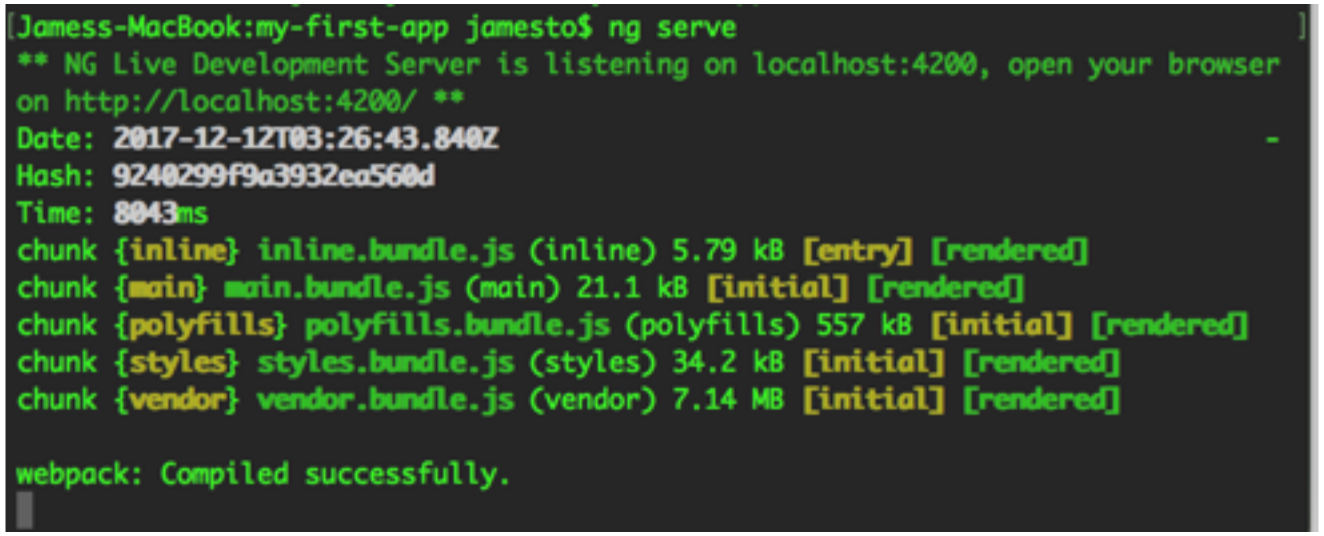
- Angular cli is a toolset that makes creating, managing and building your angular applications very simple.
- Quickly creates angular projects
- Provide commands to build our projects further
- It allows us to focus on Angular code instead of workflow tasks!
- Building from script file would take more than just importing to html
- We need to install node which we did already

STEPS

- ➤ ng -v (check angular cli version)
- ➤ ng new my-first-app
- ➤ cd my-first-app
- ➤ ng serve

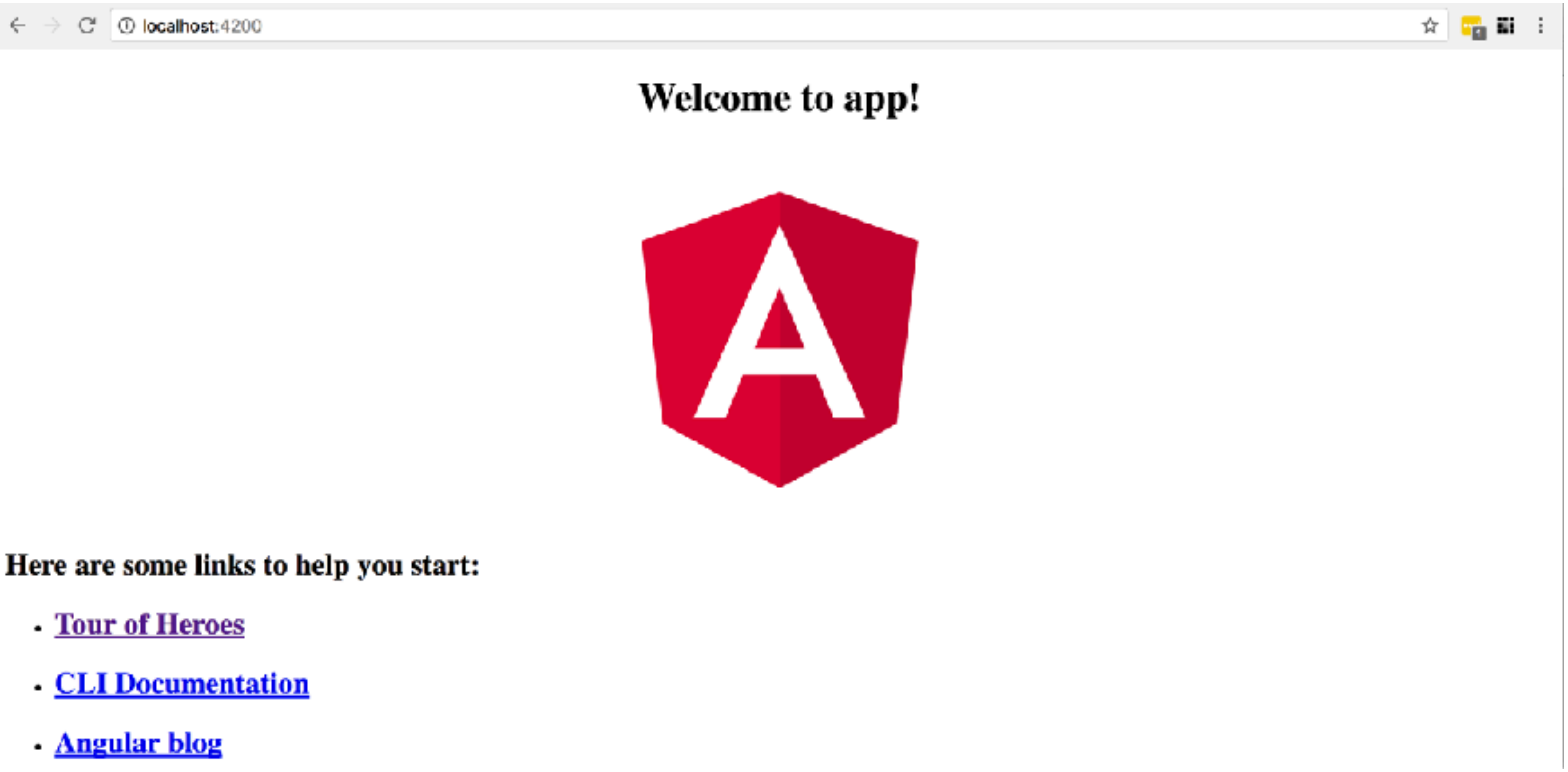


```
[Jamess-MacBook:angular jamesto$ ng new my-first-app
  create my-first-app/README.md (1026 bytes)
  create my-first-app/.angular-cli.json (1247 bytes)
  create my-first-app/.editorconfig (245 bytes)
  create my-first-app/.gitignore (516 bytes)
  create my-first-app/src/assets/.gitkeep (0 bytes)
  create my-first-app/src/environments/environment.prod.ts (51 bytes)
  create my-first-app/src/environments/environment.ts (387 bytes)
  create my-first-app/src/favicon.ico (5430 bytes)
  create my-first-app/src/index.html (297 bytes)
  create my-first-app/src/main.ts (370 bytes)
  create my-first-app/src/polyfills.ts (2405 bytes)
  create my-first-app/src/styles.css (80 bytes)
  create my-first-app/src/test.ts (1085 bytes)
  create my-first-app/src/tsconfig.app.json (211 bytes)
  create my-first-app/src/tsconfig.spec.json (304 bytes)
  create my-first-app/src/typings.d.ts (104 bytes)
  create my-first-app/e2e/app.e2e-spec.ts (294 bytes)
  create my-first-app/e2e/app.po.ts (208 bytes)
  create my-first-app/e2e/tsconfig.e2e.json (235 bytes)
  create my-first-app/karma.conf.js (923 bytes)
  create my-first-app/package.json (1317 bytes)
  create my-first-app/protractor.conf.js (722 bytes)
  create my-first-app/tsconfig.json (363 bytes)
```



```
Jamess-MacBook:my-first-app jamesto$ ng serve
** NG Live Development Server is listening on localhost:4200, open your browser
on http://localhost:4200/ **
Date: 2017-12-12T03:26:43.840Z
Hash: 9240299f9a3932ea560d
Time: 8043ms
chunk {inline} inline.bundle.js (inline) 5.79 kB [entry] [rendered]
chunk {main} main.bundle.js (main) 21.1 kB [initial] [rendered]
chunk {polyfills} polyfills.bundle.js (polyfills) 557 kB [initial] [rendered]
chunk {styles} styles.bundle.js (styles) 34.2 kB [initial] [rendered]
chunk {vendor} vendor.bundle.js (vendor) 7.14 MB [initial] [rendered]

webpack: Compiled successfully.
```

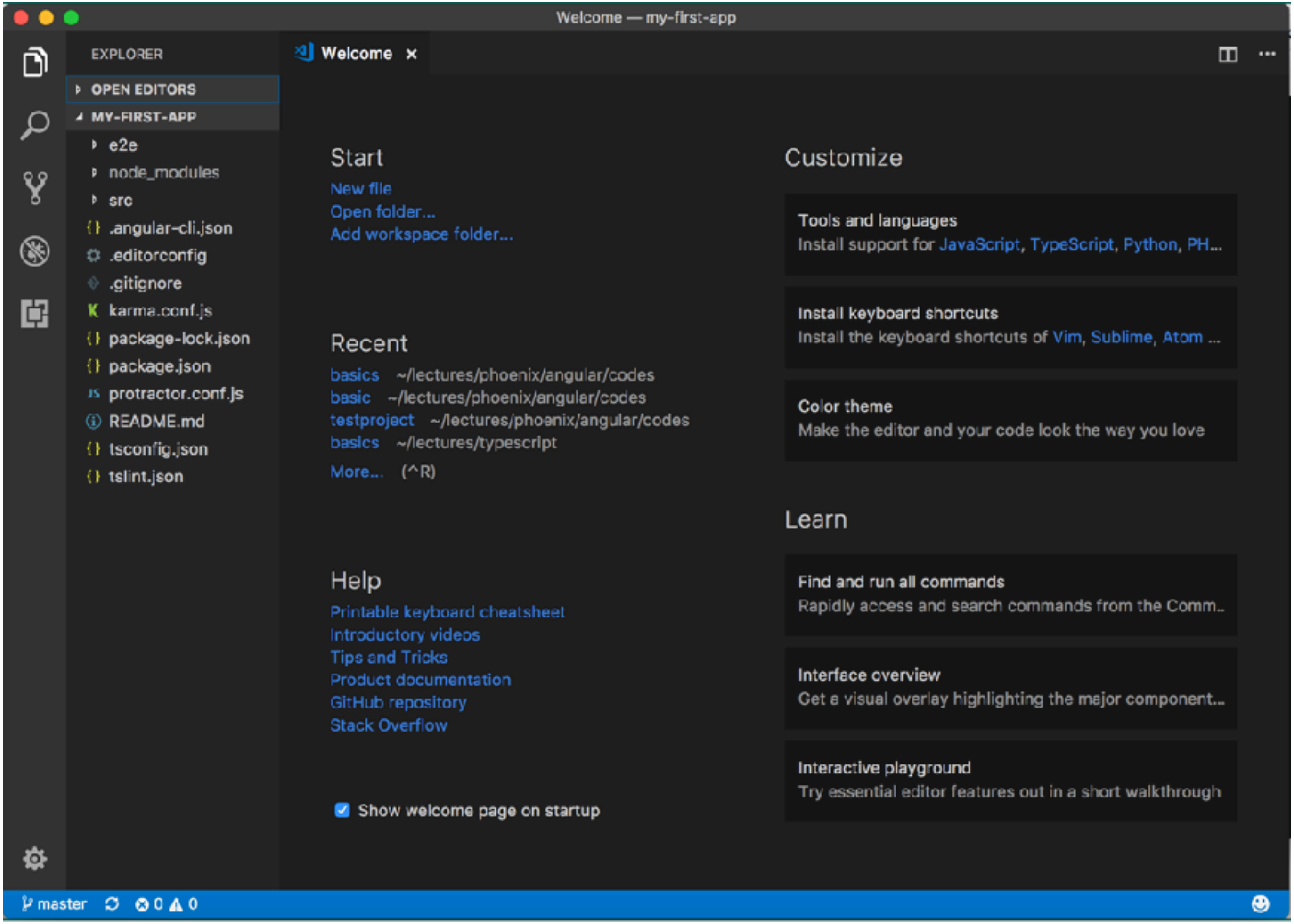


Welcome to app!

Here are some links to help you start:

- Tour of Heroes
- CLI Documentation
- Angular blog

CODE STRUCTURE UNDER VISUAL STUDIO



Start

New file
Open folder...
Add workspace folder...

Recent

basics ~/lectures/phoenix/angular/codes
basic ~/lectures/phoenix/angular/codes
testproject ~/lectures/phoenix/angular/codes
basics ~/lectures/typescript
More... (^R)

Help

Printable keyboard cheatsheet
Introductory videos
Tips and Tricks
Product documentation
GitHub repository
Stack Overflow

☑ Show welcome page on startup

Customize

Tools and languages
Install support for JavaScript, TypeScript, Python, PH...

Install keyboard shortcuts
Install the keyboard shortcuts of Vim, Sublime, Atom ...

Color theme
Make the editor and your code look the way you love

Learn

Find and run all commands
Rapidly access and search commands from the Comm...

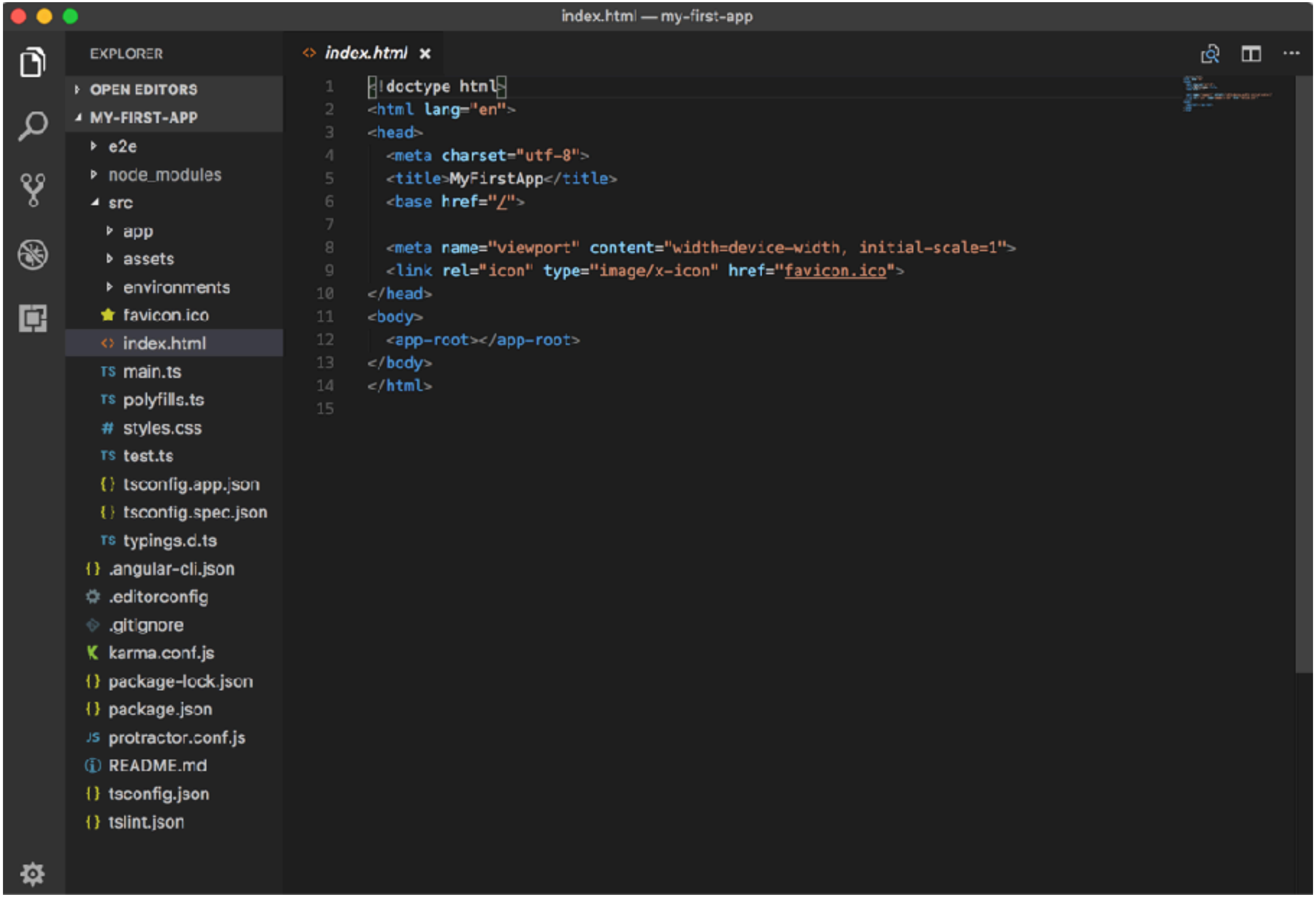
Interface overview
Get a visual overlay highlighting the major component...

Interactive playground
Try essential editor features out in a short walkthrough

CODE STRUCTURE

- Configuration files
- E2e (end to end testing)
- Src (where our project is created)
- Specific configurations inside src folder
- Index.html (single page the application will serve)
- All code in the app folder
- Assets is for css, images, javascript
- Environments for environments variables

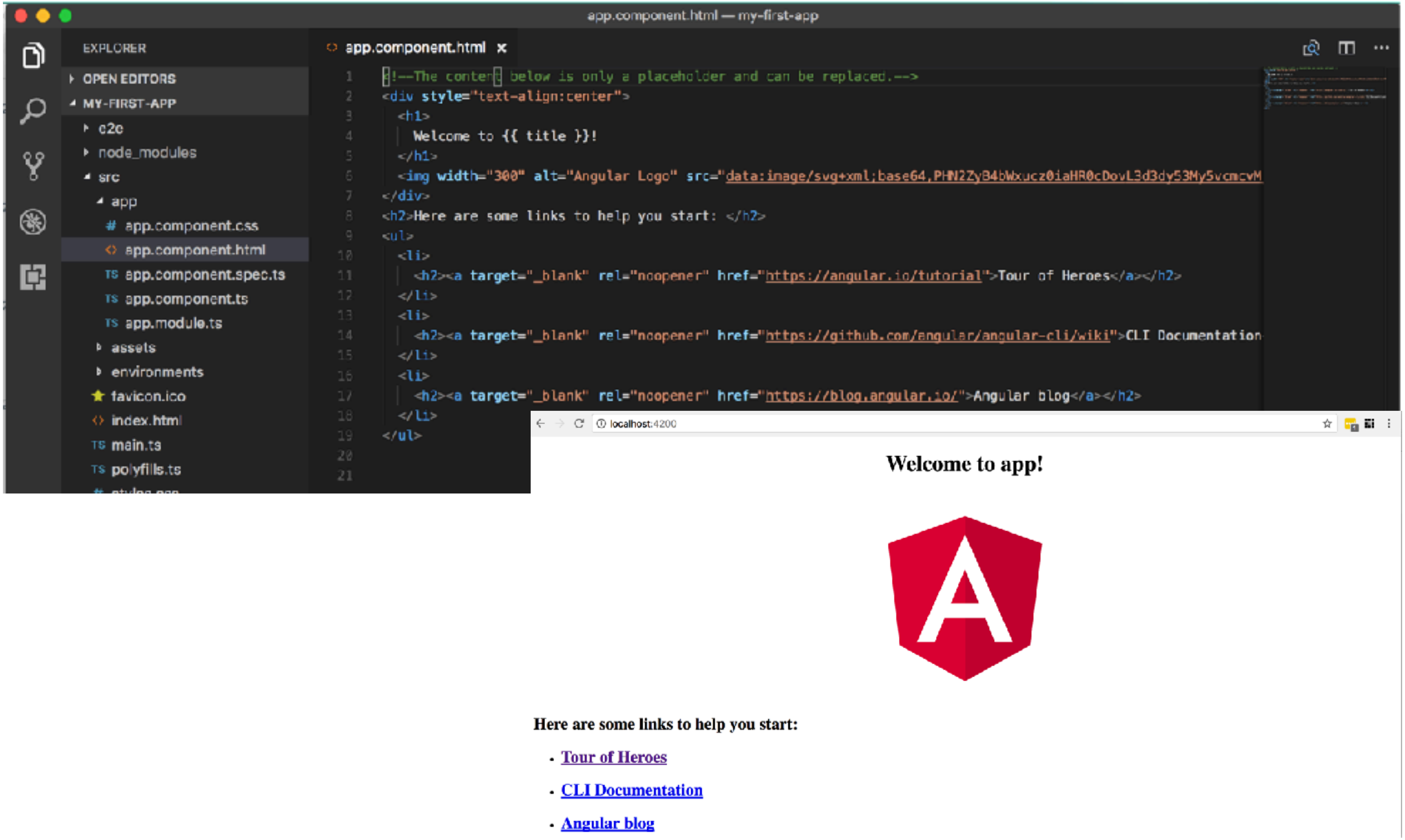
MORE OR STRUCTURE



```html
<!doctype html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <title>MyFirstApp</title>
  <base href="/">

  <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="icon" type="image/x-icon" href="favicon.ico">
</head>
<body>
  <app-root></app-root>
</body>
</html>
```

APP FOLDER AND CODES



```html
<!--The content below is only a placeholder and can be replaced.-->
<div style="text-align:center">
  <h1>
    Welcome to {{ title }}!
  </h1>
  <img width="300" alt="Angular Logo" src="data:image/svg+xml;base64,PHN2ZyB4bWxucz0iaHR0cDovL3d3dy53My5vcmcvM
</div>
<h2>Here are some links to help you start: </h2>
<ul>
  <li>
    <h2><a target="_blank" rel="noopener" href="https://angular.io/tutorial">Tour of Heroes</a></h2>
  </li>
  <li>
    <h2><a target="_blank" rel="noopener" href="https://github.com/angular/angular-cli/wiki">CLI Documentation
  </li>
  <li>
    <h2><a target="_blank" rel="noopener" href="https://blog.angular.io/">Angular blog</a></h2>
  </li>
</ul>
```

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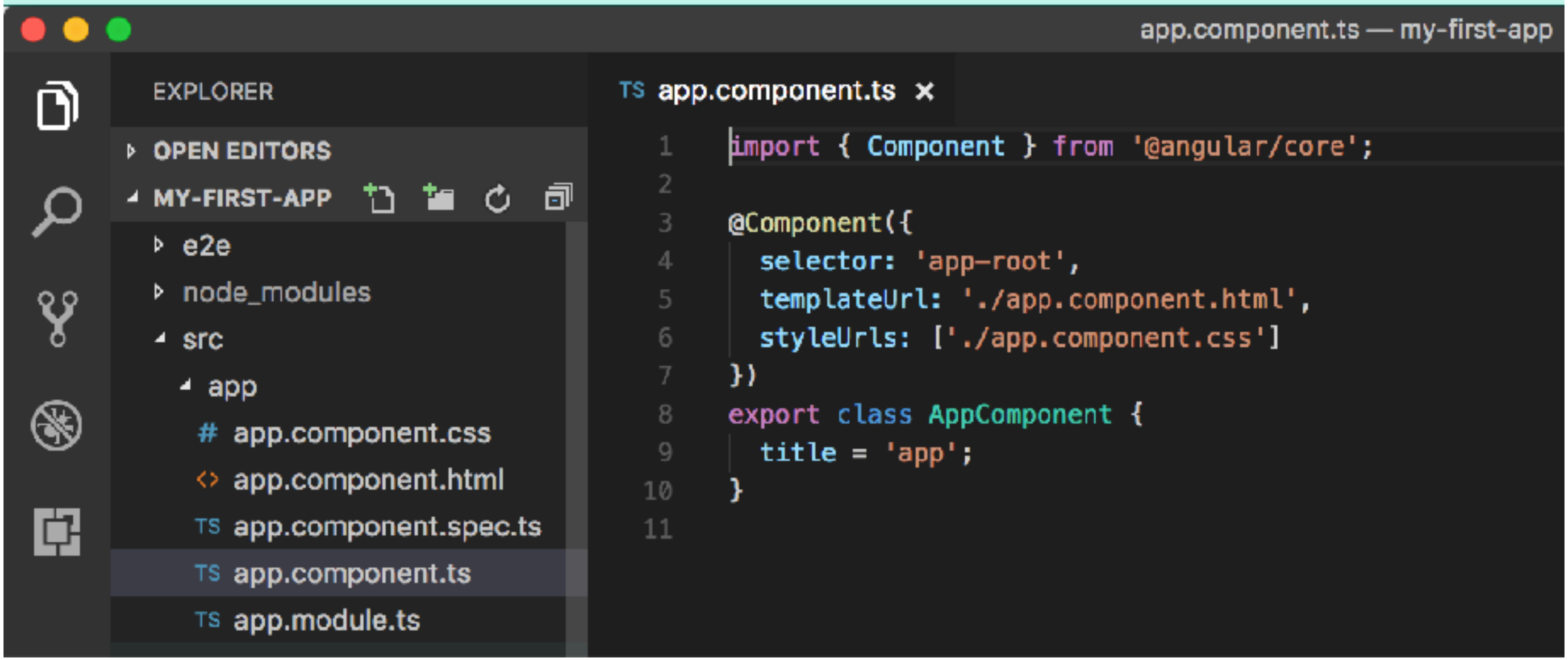
APP.COMPONENT.TS

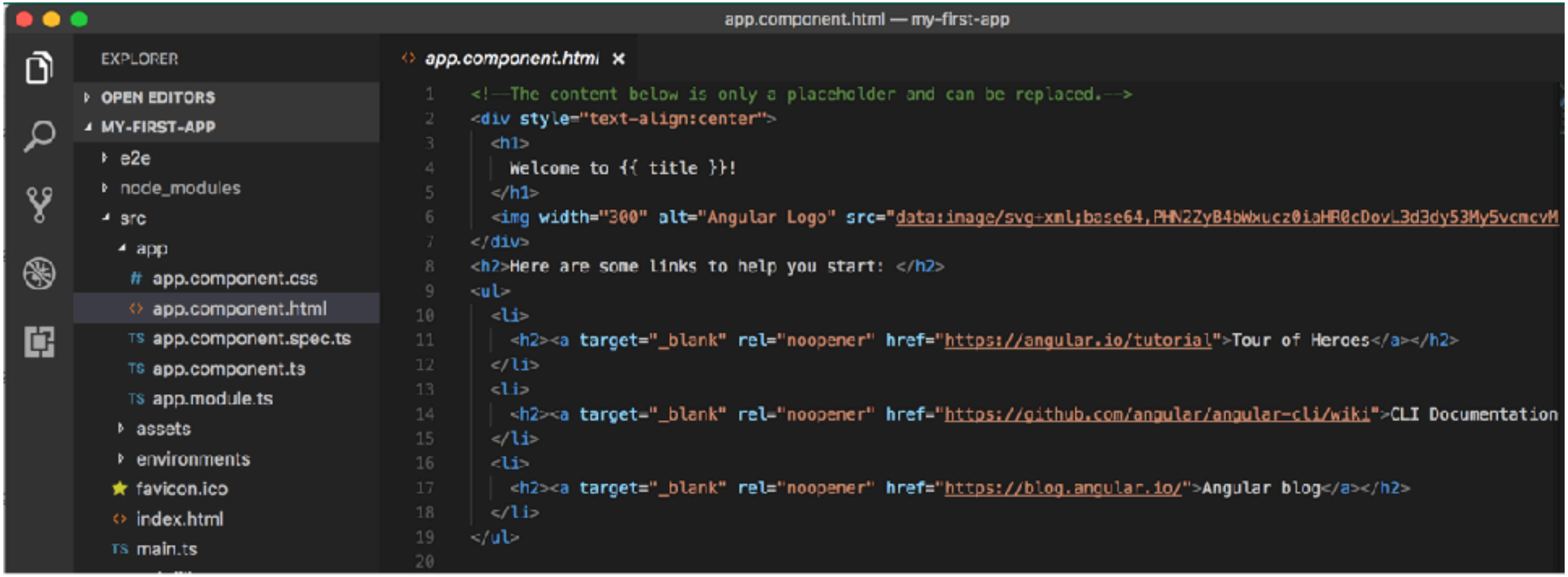


```typescript
import { Component } from '@angular/core';

@Component({
  selector: 'app-root',
  templateUrl: './app.component.html',
  styleUrls: ['./app.component.css']
})
export class AppComponent {
  title = 'app';
}

```

APP.COMPONENT.HTML



```html
<!--The content below is only a placeholder and can be replaced.-->
<div style="text-align:center">
  <h1>
    Welcome to {{ title }}!
  </h1>
  <img width="300" alt="Angular Logo" src="data:image/svg+xml;base64,PHN2ZyB4bWxucz0iaHR0cDovL3d3dy53My5vcmcvM
</div>
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  <li>
    <h2><a target="_blank" rel="noopener" href="https://blog.angular.io/">Angular blog</a></h2>
  </li>
</ul>
```
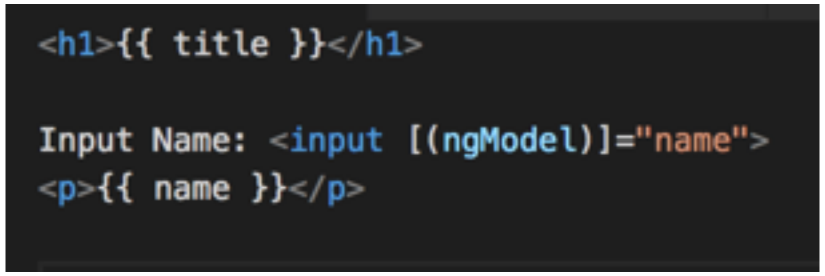
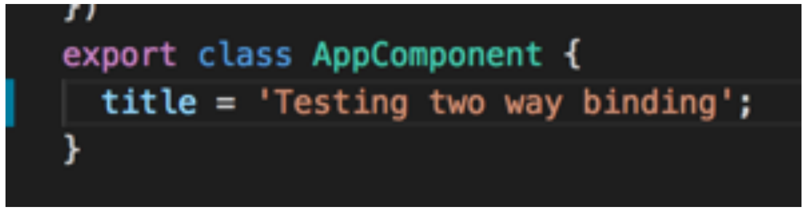

QUICK SAMPLE OF DATA BINDING

- app.component.html



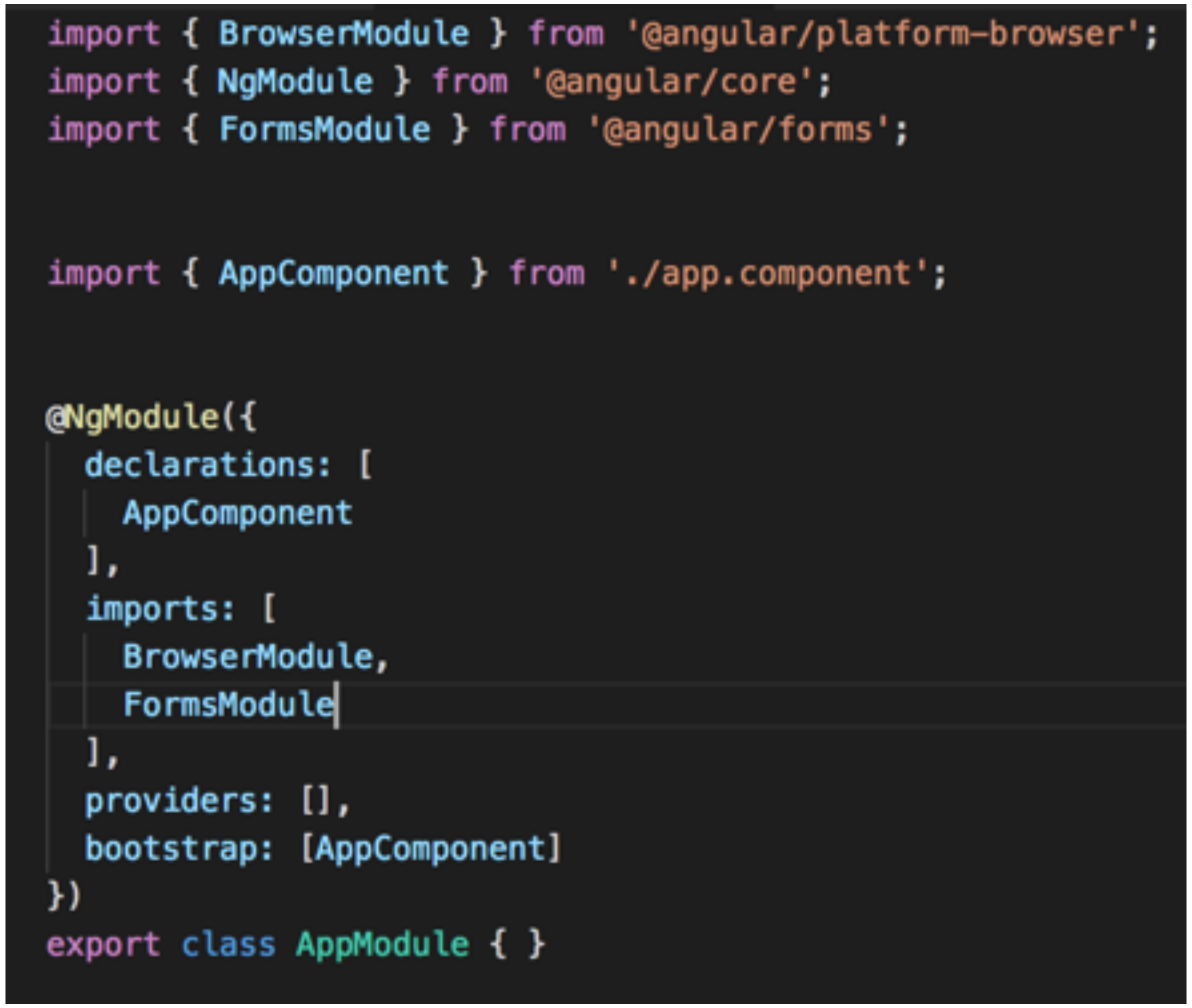
```html
<h1>{{ title }}</h1>

Input Name: <input [(ngModel)]="name">
<p>{{ name }}</p>
```

- app.component.ts



```typescript
})
export class AppComponent {
  title = 'Testing two way binding';
}
```

- app.module.ts



```typescript
import { BrowserModule } from '@angular/platform-browser';
import { NgModule } from '@angular/core';
import { FormsModule } from '@angular/forms';


import { AppComponent } from './app.component';


@NgModule({
  declarations: [
    AppComponent
  ],
  imports: [
    BrowserModule,
    FormsModule
  ],
  providers: [],
  bootstrap: [AppComponent]
})
export class AppModule { }
```

SUMMARY

- ANGULAR
- INSTALLATON
- TYPESCRIPT
- ANGULAR CLI
- FIRST APP
- IN THE NEXT TOPIC WE WILL EXPAND ON THE FOLLOWING:
    - THE BASICS
    - COMPONENTS AND DATABINDING
    - DIRECTIVES (ngModel as a sample and build your own)
    - SERVICES AND DEPENDECY INJECTION
    - ROUTING
    - OBSERVABLES (async code)
    - FORMS
    - PIPES
    - HTTP
    - AUTHENTICATION
    - OPTIMIZATIONS
    - DEPLOYMENT

EXTRA

- If we have time we can discuss animations

PART 1 COMPLETE