Angular Components Overview & Examples

26 Comments / 10 minutes of reading / March 12, 2023

← Bootstrapping in Angular Angular Tutorial Data Binding in Angular →

In this tutorial, we are going to look at **Angular Component**s. We will look at the building blocks of the components and the important metadata properties of Angular Components like **selector**, **template**, **styleURL**, etc. We will build a **Hello World App in Angular** and show you how create a Angular Component (`HelloWorldComponent`) .

Table of Contents

What is an Angular Component

The Angular Component is the main building block of an Angular application.

The Component contains the data and user interaction logic that define how the View looks and behaves. A view in Angular refers to a template (HTML).

The Angular Components are plain JavaScript classes defined using the **@Component Decorator**. This Decorator provides the Component with a View to display and Metadata about the Component.

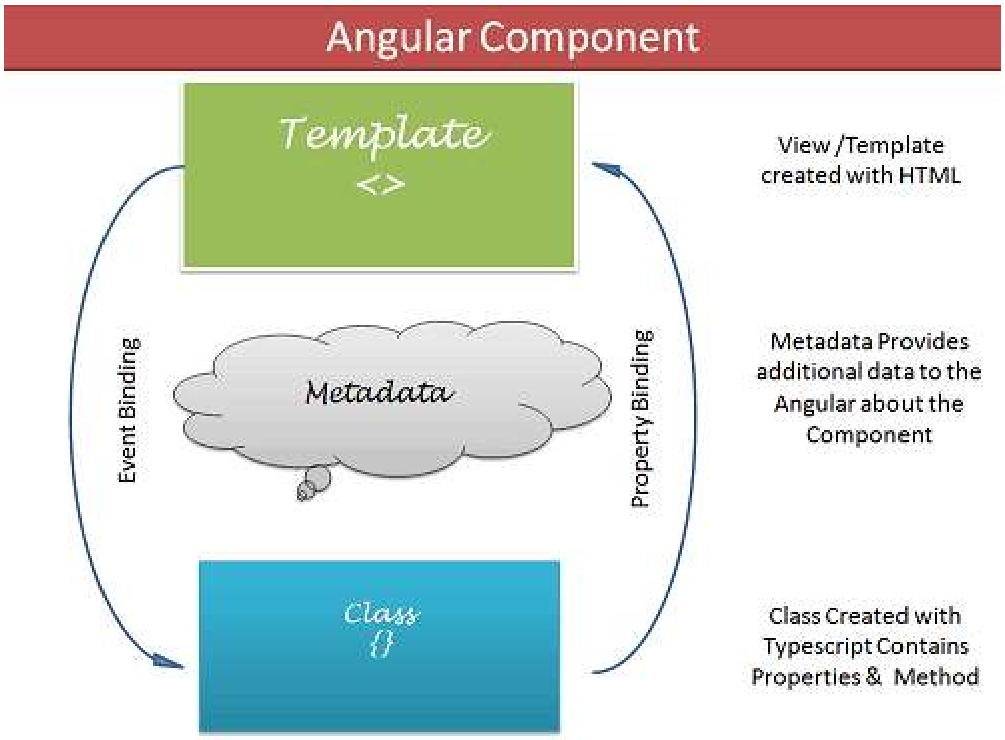
The Component is responsible for providing the data to the View. Angular uses data binding to get the data from the Component to the View and vice versa. The data binding is achieved using special HTML markup, the **Angular Template Syntax**. The Component can also get notified when the View changes.

Angular applications can have lots of components. Each Component handles a small part of the UI. These components work together to produce the complete user interface of the application.

The Components consist of three main building blocks

- Template

- Class
- MetaData


Angular Component
Template
<>
Metadata
Class
{}
Event Binding
Property Binding
View /Template created with HTML
Metadata Provides additional data to the Angular about the Component
Class Created with Typescript Contains Properties & Method

Building blocks of the Angular Components

Template (View)

The Template defines the layout and content of the View. Without the template, there is nothing for Angular to render to the DOM.

The Templates are only HTML codes and the Angular-specific special HTML markups (known as the Angular Template Syntax).

You can add Angular directives, Angular Pipes & Other Angular Components on the template.

The data to Template comes from the Component, which gets it from an Angular Service. We can keep the Template in sync with the Component using the data binding techniques. The templates can use Event Binding or two-way data binding to notify the component when the user changes something on the View.

There are two ways you can specify the Template in Angular.

1. Defining the Template Inline
2. Provide an external Template

Class

The Class provides the data & logic to the View. It contains the Typescript code associated with Template (View). We use TypeScript to create the class.

Class Contains the Properties & Methods. The Properties of a class can be bound to the view using Data Binding.

The simple Angular Class

```

export class AppComponent
{
   title : string ="app"
}

```

By convention, we suffix the Component class as Component to easily identify them.

Metadata

Metadata Provides additional information about the component of Angular. Angular uses this information to process the class. We use the `@Component` decorator to provide the Metadata to the Component.

@Component decorator

A decorator is a function that adds metadata to a class, its methods & to its properties. The Components are defined with a `@Component` class decorator.

When Angular sees a class with `@Component` decorator, it treats the class as a Component.

A Decorator is always prefixed with @. We must place the Decorator immediately before the class definition. We can also build our own decorators. The decorators are Similar to attributes in C#

Important Component metadata properties

Selector

Selector specifies the simple CSS selector. The Angular looks for the CSS selector in the template and renders the component there.

Providers

The Providers are the Angular Services that our component is going to use. The Services provide service to the Components or to the other Services.

Directives

The directives that this component going to use are listed here.

Styles/styleUrls

The CSS styles or style sheets that this component needs. Here we can use either an external stylesheet (using styleUrls) or inline styles (using Styles). The styles used here are specific to the component

template/templateUrl

The HTML template that defines our View. It tells Angular how to render the Component's view. The templates can be inline (using a template) or we can use an external template (using a templateUrl). The Component can have only one template. You can either use an inline template or an external template, and not both.

How to Create Angular Component

Create a new Angular application. If you are new to Angular, you can follow the steps provided in the following tutorial to create the application

1. Install Angular
2. Create Angular Project

When we create a new project, Angular automatically creates the component **app.component.ts**. It will also mark this as a root component, so when you run the project, it will display its template (**app.component.html**) to the user.

In this tutorial, we add another angular component and make it the root component. We name our Component **HelloWorldComponet**. When we run the App, it will display contents from the newly created Component.

Creating an Angular Component requires us to follow these steps

1. Create the Component file.
2. Import the required external Classes/Functions.
3. Create the Component class and export it.
4. Add @Component decorator
5. Add metadata to @Component decorator
6. Create the Template
7. Create the CSS Styles
8. Register the Component in Angular Module

Create the Component file

Select the **src/app** folder, **right-click**, and **click on the new file**. Enter the name of the file as **hello-world.component.ts**

The file name starts with the **feature name** (hello-world) by convention. We then follow it up with a dot and **type of class** (Component). The extension used is **.ts** indicating that this is a typescript module file.

You can read more about naming conventions from the Angular Style Guide.

Import the Angular Component Library

Before we use any Angular (or external) functions or classes, we need to tell Angular how and where to find them. We do this using the Import statement. The Import statement is similar to the using statement in c#. It allows us to use the external modules in our class.

To define the Component class, we need to use the @Component decorator. This function is part of the Angular Core library. So we import it into our class as shown below

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

Create the Component Class and export it

The third step is to create the Component class using the export keyword. The Export keyword allows other components to use this Component by importing it.

```

export class HelloWorldComponent {
  title = 'Hello World';
}

```

Note we are using Pascal case naming conventions for the class name. The above class defines a Property named title and assigns a default value, “Hello World”.

Add @Component decorator

The next step is to inform Angular that this is a Component class. We do that by adding the @Component decorator. We must add the decorator immediately above the class definition.

```

@Component({
})
export class HelloWorldComponent {
  title = 'Hello World';
}

```

Add metadata to @Component decorator

The next step is to add the metadata to the Component using the @component decorator. Add the following to the component metadata.

```

@Component({
  selector: 'app-hello-world',
  templateUrl: './hello-world.component.html',
  styleUrls: ['./hello-world.component.css']
})
export class HelloWorldComponent {
  title = 'Hello World';
}

```

selector

We have chosen `app-hello-world` as the selected for this Component. The Angular, wherever it finds the selector `app-hello-world` in the HTML, renders the HelloWorldComponent in its place.

templateUrl

In the above example, we have used an external template using templateUrl metadata —the templateUrl points to the external HTML file **hello-world.component.html**.

We can specify only one file as a template file per Component.

styleUrls

styleUrls declares the styles for our Template. The metadata points to the external CSS file **hello-world.component.css**. This file is a Component specific CSS style.

We can include more than one CSS file.

Create the Template (View)

The Template is an HTML file, which the Component must display to the user.

The Angular knows which template display, using the **templateUrl** metadata, which points to **hello-world.component.html**.

Select the **src/app** folder, **right-click**, and **click on the new file**. Enter the name of the file as **hello-world.component.html.**

By convention, we give the same name as the component file it represents. It will have an extension of HTML.

```

<h1>
  {{title}}!
</h1>

```

Note that **title** *is* inside the **double curly bracket**. When rendering the View, Angular looks for the **title Property** in our Component and binds the property to our View. We call this data binding. The double curly bracket syntax is known as interpolation, which we will look at in our following tutorial.

Add the Styles

The next step is to add the CSS Styles. The styleUrls metadata tells Angular where to find the CSS File. This property points to external file **hello-world.component.css**

By convention, we name the file after the component file with the .css extension. Note that styleUrls metadata can accept multiple CSS Files.

Select the **src/app** folder, **right-click**, and **click on the new file**. Enter the name of the file as **hello-world.component.css**

Let us keep the file blank for now.

Register the Component in Angular Module

We have created the Angular Component. The next step is to register it with the Angular Module. Our application already has one Module, i.e., `app.module.ts` , which is also a root module.

The root module is the Module Angular loads when the App starts.

The Angular Module organizes the related components, directives, pipes, and services and arranges them into cohesive blocks of functionality.

We use the @NgModule class decorator to define an Angular Module and provide metadata about the Modules. There are four important properties of @NgModule metadata. They are **declaration**, **imports**, **providers** & **bootstrap.**

We include the components, pipes, and directives part of this Module in the **declaration array**.

We add all the other Angular Modules this Module needs in the **imports array**.

Include all the angular services part of this Module in the **providers' array**.

Assign the Component we want to load when Angular loads this Module to the **bootstrap array**.

To Make use of our `HelloWorldComponent`, we import it.

```

import { HelloWorldComponent } from './hello-world.component';

```

We also need to add it to the **declaration array**.

```

  declarations: [
    AppComponent, HelloWorldComponent
  ],
```

```

```

Now, our Component is ready to use.

Our final `app.module.ts` .

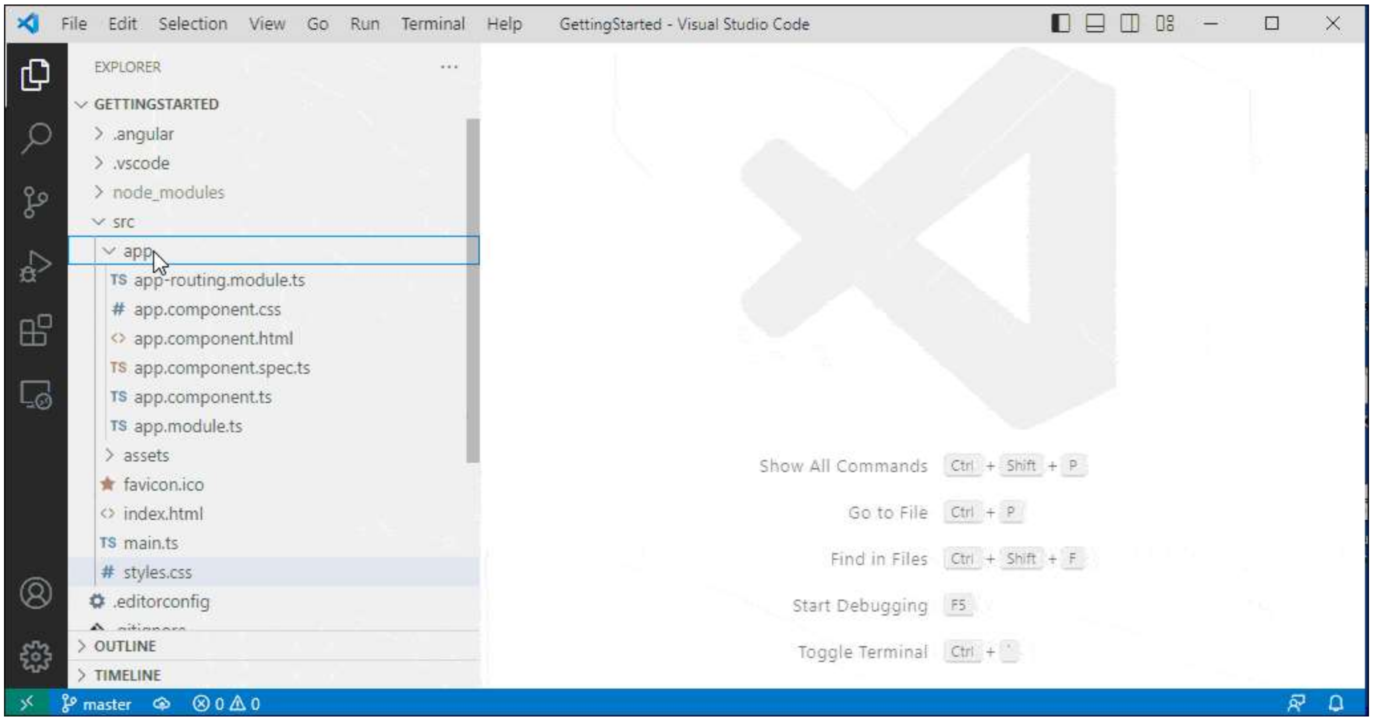
```

import { NgModule } from '@angular/core';
import { BrowserModule } from '@angular/platform-browser';

import { AppRoutingModule } from './app-routing.module';
import { AppComponent } from './app.component';
import { HelloWorldComponent } from './hello-world.component';

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

```



HelloWorldComponent as Root Component

When the application starts, It loads the `AppComponent`. Let us change it and display `HelloWorldComponent` instead.

To do that, we assign the `HelloWorldComponent` Component to the bootstrap property and remove the `AppComponent`.

You can just open the `app.module.ts` and locate the following code.

```
bootstrap: [AppComponent]

```

Update it with the following code.

```

bootstrap: [HelloWorldComponent]

```

Now open the **src/app/index.html** and locate the following line.

```

<body>
<app-root></app-root>
</body>

```

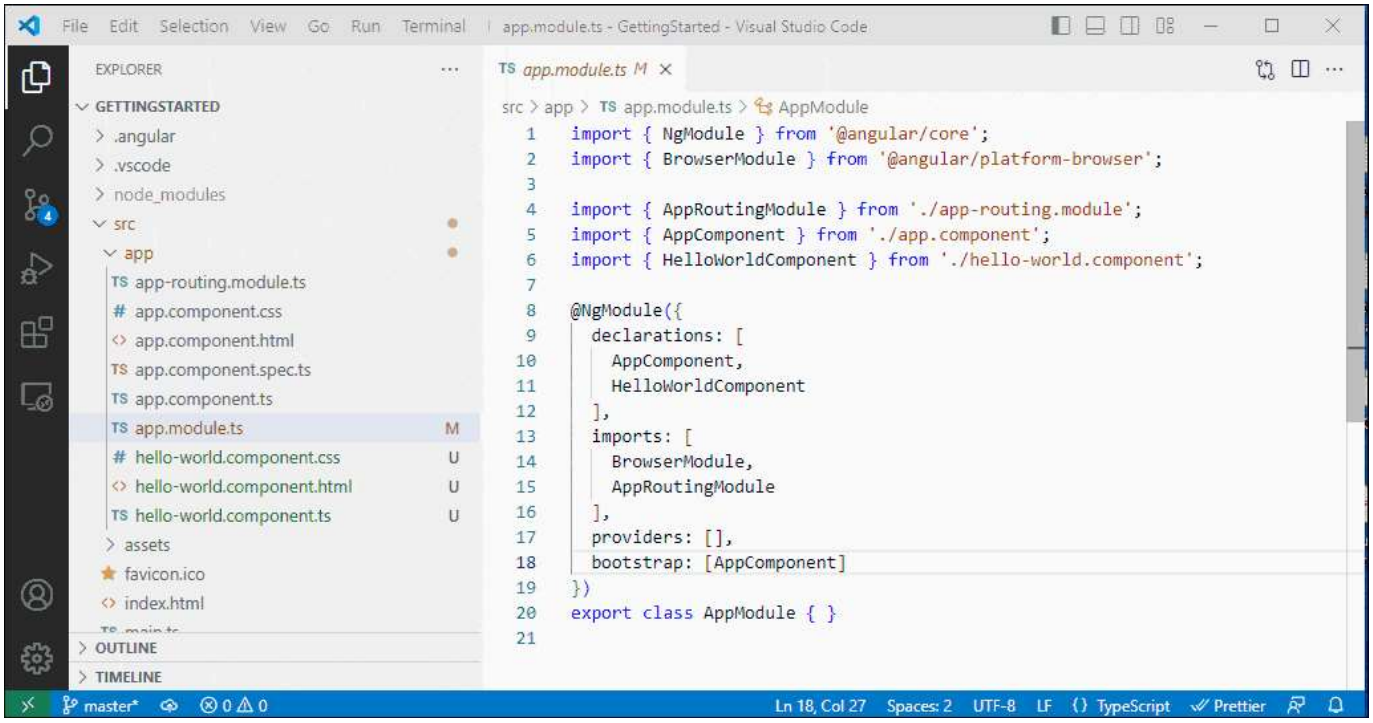
and replace it with this

```

<body>
 <app-hello-world></app-hello-world>
</body>

```

Run the App using `ng serve --open`. You will see **“Hello World**” on the screen.



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

import { AppRoutingModule } from './app-routing.module';
import { AppComponent } from './app.component';
import { HelloWorldComponent } from './hello-world.component';

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

Multiple Root Components

Angular allows us to bootstrap multiple components. We can make both `HelloWorldComponent` and `AppComponent` as root components.

We need to update the bootstrap array property of the `app.module.ts` and also add both selectors in **index.html.**

Update the **bootstrap property** in the `app.module.ts` .

```

bootstrap: [AppComponent, HelloWorldComponent]

```

Add both selectors in the **index.html**

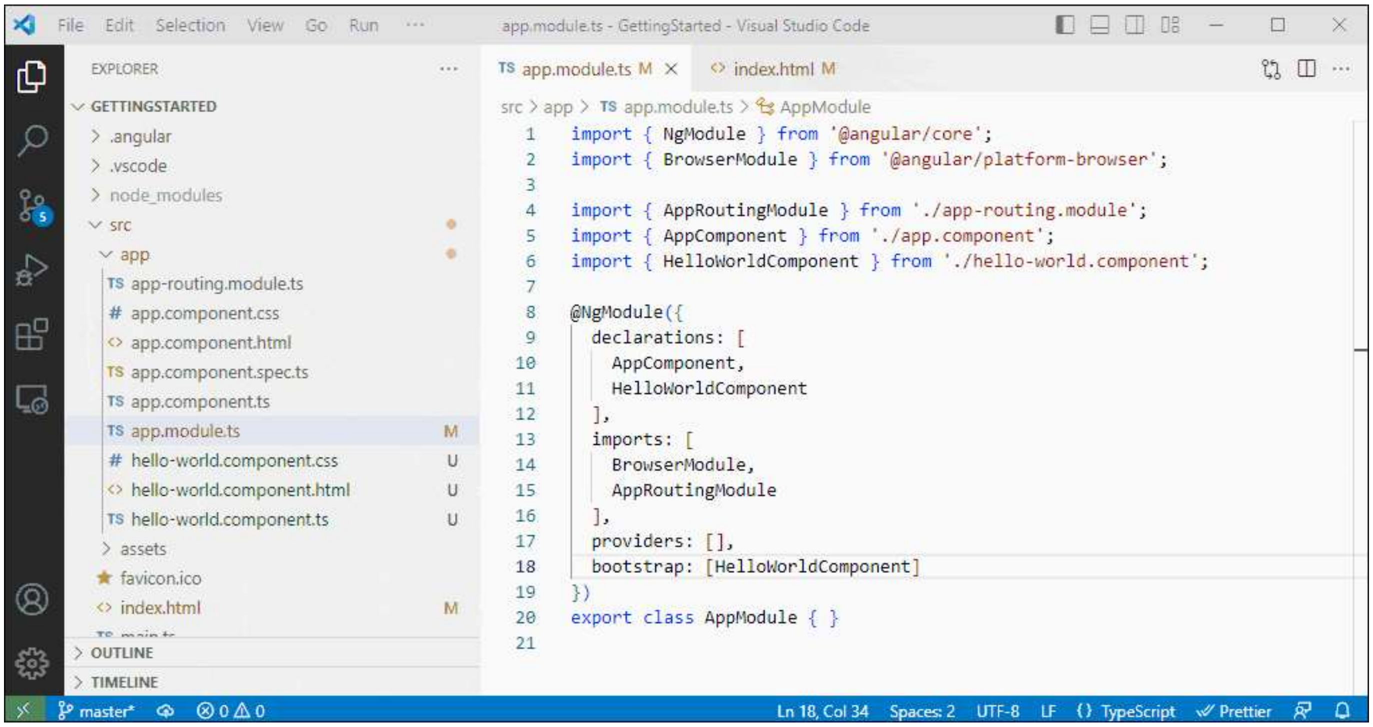
```

<body>
  <app-hello-world></app-hello-world>
  <app-root></app-root>
</body>
```

Open the **app.component.html** and update the content to

```
<h1>Hello for AppComponent</h1>
```

Run the application.


File Edit Selection View Go Run ···
app.module.ts - GettingStarted - Visual Studio Code
EXPLORER
GETTINGSTARTED
.angular
.vscode
node_modules
src
app
app-routing.module.ts
app.component.css
app.component.html
app.component.spec.ts
app.component.ts
app.module.ts M
hello-world.component.css U
hello-world.component.html U
hello-world.component.ts U
assets
favicon.ico
index.html M
OUTLINE
TIMELINE
app.module.ts M
index.html M
src > app > app.module.ts > AppModule
master* ⊗ 0 ⚠ 0
Ln 18, Col 34 Spaces: 2 UTF-8 LF {} TypeScript ✓ Prettier

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

import { AppRoutingModule } from './app-routing.module';
import { AppComponent } from './app.component';
import { HelloWorldComponent } from './hello-world.component';

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

Display as a Child Component

We rendered the HelloWorldComponet as the root component. But this is not the correct way to render a child component. You should have only one Component as the root Component. All other Components must be rendered as the child of the root component.

There are two ways in which we can display a child Component.

1. Via Angular Router
2. Via Component Selector

The Angular Router Tutorial covers rendering a Component using the Angular Router.

We already used the component selector to render the Component (`app-hello-world` for `HelloWorldComponent`). To render `HelloWorldComponent` as child component follow the following steps

1. Remove the `<app-hello-world></app-hello-world>` from the **index.html**.
2. Remove the `HelloWorldComponent` from the **bootstrap property** in `app.module.ts` .
3. Open the `app.component.html` and add the `app-hello-world` selector.

```

<h1>Hello for AppComponent</h1>
<app-hello-world></app-hello-world>

```

Now the `HelloWorldComponent` renders as a child component of the `AppComponent` .

Summary

Follow these steps to create the Angular Component

1. Create the Component file.
2. Import the required external Classes/Functions.
3. Create the Component class and export it.
4. Add @Component decorator
5. Add metadata to @Component decorator
6. Create the Template