**RK Angular Notes**

**What is Angular ?**

Framework to create Single Page Applications (DOM of page is dynamically changed without page refresh).

**Environment Setup**

1. Download and install latest version of NodeJS
2. Install Angular CLI with command sudo ng install –g @angular/cli

**Create a Project from command Line**

ng new my-project-name

**Start app from command line (navigate to project-folder)**

ng serve

* App is compiled, built and deployed on a local server. Available at <http://localhost:4200>
* A separate thread will monitor for all the changes. As soon as a file is edited and Saved, it is immediately deployed.

**Project Structure**

* **e2e** folder is used for End-to-end testing
* The project code is located in the **src** folder
* **index.html** is the single page that is served in the app.
* Folder “**assets**” is used to store static assets like images.
* “**environments**” folder is used for storing environment variables
* Folder “**app**” is the main folder where we will be working.
* Components are the things that are loaded and displayed.
* The specific html of that component is responsible for the html content, and the ts (typescript) file is responsible for variables and configurations of the component.
* HTML file is what we see, TypeScript is the source of business logic
* app.modules.ts is used to import and enable/unlock the features/components that will be used in this component

**Checkout Existing code from Repo and start (initialize) an angular CLI project**

git clone <what-ever-remote-path>

cd my-project

npm install

ng version

ng run (or npm start)

**What is TypeScript**

Superset to Javascript

Offers more features than vanilla Javascript

Classes, Interfaces and Types (data-types which will get checked at the time of creating variables and running the code )

Typescript doesn’t run in the browser, needs to compiled to Javascript

**Incorporating Bootstrap into angular Project**

npm install –save bootstrap

In file “**.angular-cli.json**” has a styles array under apps. This allows us to define multiple stylesheets that will apply to the whole application.

**(src/styles.css** is already referenced there.)

In “**.angular-cli.json**” add reference to the bootstrap css by adding one more entry : "../node\_modules/bootstrap/dist/css/bootstrap.min.css"

Now the application will start using the bootstrap styling.

**How Angular Starts working in the app**

“index.html” is the single page that is served by the server

In “index.html” we have <app-root></app-root>

Angular replaces this tag with the contents from “**app.component.html**” because inside file “**app.component.ts**” we have defined a component.

The component is identified by the **selector: ‘app-root’** (this gives the name of the tag)

And content for it comes from **templateUrl: './app.component.html'**

**But how does it know about app.component.ts ?**

In “**src/main.ts**” this code is executed platformBrowserDynamic().bootstrapModule(AppModule)

i.e. it initializes the application with **AppModule**.

The AppModule comes from **src/app/appmodule.ts**

From **appmodule.ts** it knows about “**app.component.ts**” which in-turn has references to **app.component.html** (the component’s html) and **app.component.css** (css specific for that component)

**Components**

Component is a set of code that has some functionality.

The whole application is composed of putting together various components.

App-component is the root component where all the other components will be nested into.

This strategy aids Reusability (of components).

**Creating Components**

Usually Created in in “src/app” each component has it’s own folder.

**Angular uses “components” to build web-pages and uses “modules” to build packages**

Module: is basically a bundle of functionalities and gives angular information on which features my app uses.

**Manual way of creating component**

In the folder for the component, create a

**<my>.component.ts**

**import** {Component} **from** "@angular/core";  
  
@Component({  
 selector: 'app-server',  
 templateUrl: './server.component.html'  
})  
**export class** ServerComponent {  
  
}

@Component is the decorator and it has attributes ‘selector’ and ‘templateUrl’

**<my>.component.html**

<p>This is the Server Component</p>

in the **app.modules.ts** register the component

**import** {ServerComponent} **from** "./serverComponent/server.component";

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

Then you can start using it in the **app.component.html**

<app-server></app-server>

**Using CLI command to create component**

**ng generate component <component-name>**

or **ng g c <component-name>**

**Component Inline html template**

Instead of using (referring to) an external template file

@Component({  
 selector: 'app-server',  
 templateUrl: './server.component.html'  
})  
**export class** ServerComponent {  
}

we can also specify an inline html template

@Component({  
 selector: 'app-servers',  
 template: '<app-server></app-server> <br/> inline template <br/> <app-server></app-server>',  
 styleUrls: ['./servers.component.css']  
})  
**export class** ServersComponent **implements** OnInit {  
  
 **...**  
}

For multi-line template content we can use the back-tick

template: `  
 <app-server></app-server> 1  
 <br/> inline template <br/>   
 <app-server></app-server> 2`,

It is mandatory to have either **templateUrl** or **template** property.

**Component Styles**

styleUrls: ['./servers.component.css']

Also we can use inline styling using ‘**styles**’ array-attribute

styles: [`  
 h1 {  
 color: dodgerblue;  
 }  
`]

can’t combine **styleUrls** and **styles**. You can have only one of those

**Component Selectors**

1. **Tag-name**

selector: 'app-servers', // tag-name selector (default)

usage :

<app-servers></app-servers>

1. **Attribute-name**

selector: '[app-servers]', // attribute name selector

usage

<div app-servers ></div>

1. **Css-class-name**

selector: '.app-servers', // css class-name selector

usage

<input type="text" [(ngModel)]="myName">

**Data-Binding**

Refers to binding the html to data (properties or function returns) from the TS.

#### On HTML, properties declared in TS can be printed using **{{ property-name }}**

The property definition in TS

**export class** ServersComponent **implements** OnInit {  
  
 allowNewServer = **false**;

can be shown in the HTML using **Data-biding**

<p>{{ allowNewServer }}</p>

or we could also call a function that returns a value that could be converted to string **{{ getAllowNewServer() }}**

**Property-Binding**

Binding an HTML element’s property to a field from the TS class.

Similar to earlier example, HTML element properties also can be bound as below

<p [innerText]="allowNewServer"></p>

Here the property ‘innerText’ is bound to the allowNewServer field.

We are not allowed to use it as **[innerText] = {{ allowNewServer }}**

**Event Binding**

Binding HTML events to functions from the TS class, like call a function on Click of button.

Say in the TS you have a property and function as below:

serverCreationStatus = 'No Server was created';  
  
onCreateServer(){  
 **this**.serverCreationStatus = 'Server was created !';  
}

Now this can be invoked as below.

<button class="btn btn-primary" (click)="onCreateServer()"  
>Add Server</button>  
  
<p [innerText]="serverCreationStatus"></p>

**Binding value of Input Element (Two Way Binding)**

***Simple Approach***

<label>Server Name</label>  
<input  
 type="text"  
 class="form-control"  
 (input)="onUpdateServerName($event)" >

On “input” event.

In TS

onUpdateServerName(event: **any**){  
 // this.serverName = event.target.value;  
  
 // explicitly informing TS about target element type  
 **this**.serverName = (<HTMLInputElement>event.target).value;  
   
 console.log("serverName : " + **this**.serverName);  
 // console.log(event);  
}

***Using [(ngModel)]***

<input  
 type="text"  
 class="form-control"  
 [(ngModel)]="serverName"  
>

The directive [(ngModel)] binds the input element’s value to the property “serverName”.

So the entered go to the property and also the property’s value if changed through code, the new value shows up in the textbox.

\*\*\* need to import **FormsModule** in **app.modules.ts** for ngModel to be available

**import** {FormsModule} **from** "@angular/forms";

**ng-if & else**

Directive **\*ng-if** can be used to show hide a block on match of the condition specified in ng-if

Also this shows or removes block of html, hence it is called **Structural Directive**, So it is prefixed with an asterisk (\*)

<p [innerText]="serverCreationStatus"  
 \*ngIf="serverCreated === true; else noServer"></p>  
  
<ng-template #noServer>  
 <p >No server was created !</p>  
</ng-template>

Directive **[ngStyle]**

We use this directive to set values to style properties of an html element.

<p [ngStyle]="{'background-color': getColor()}"> adfadf </p>

getColor(){  
 **return this**.serverStatus === 'Online' ? 'green' : 'red';  
}

we can either use the css-style property name in single quotes eg: ‘background-color’

or use Camel case without single quotes. Eg: [ngStyle]=”{ backgroundColor: ‘red’}”

Directive **[ngClass]**

This directive is used to add css class to an html element.

<p  
 [ngClass]="{online: isOnline()}"  
>

isOnline(){  
 **return this**.serverStatus === 'Online'  
}

@Component({  
 selector: 'app-server',  
 templateUrl: './server.component.html',  
 styles: [`  
 .online {  
 color: white;  
 }  
 `]  
})

So you specify the class and then the condition when the class is attached.

\*ngFor

Structural directive (in-built directive) for looping.

<app-server \*ngFor="let server of servers"></app-server>

servers = ['server-1', 'server-2'];  
  
onCreateServer(){  
 **this**.serverCreated = **true**;  
 **this**.servers.push(**this**.serverName);  
 **this**.serverCreationStatus = 'Server was created ! : ' + **this**.serverName;  
  
}

<p \*ngFor="let logValue of logValues"  
 [ngStyle]="{'background-color': getLogBackground(logValue)}"  
 [ngClass]="{whiteText : (logValue>=5)}"  
>  
 {{ logValue }}  
</p>