



MALAD KANDIVALI EDUCATION SOCIETY'S

**NAGINDAS KHANDWALA COLLEGE OF COMMERCE, ARTS &
MANAGEMENT STUDIES & SHANTABEN NAGINDAS KHANDWALA
COLLEGE OF SCIENCE**

MALAD [W], MUMBAI – 64

AUTONOMOUS INSTITUTION

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CERTIFICATE

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Programme: BSc IT/CS

Semester: III

This is certified to be a bonafide record of practical works done by the above student in the college laboratory for the course **Hybrid Application Development(classcode: 2037UCSMD)** for the partial fulfilment of Third Semester of BSc IT/CS during the academic year 2020-21.

The journal work is the original study work that has been duly approved in the year 2020-21 by the undersigned.

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Date of Examination:

(College Stamp)

Class: S.Y. B.Sc. IT Sem- III

Roll No: 395

**Subject: Hybrid Application Development
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Practical 1: AngularJS Data Binding

What is Data Binding in AngularJs?

Data-binding in AngularJS apps is the automatic synchronization of data between the model and view components. The way that AngularJS implements data-binding lets you treat the model as the single-source-of-truth in your application. The view is a projection of the model at all times. When the model changes, the view reflects the change, and vice versa.

Data Binding in Classical Template Systems

Most templating systems bind data in only one direction: they merge template and model components together into a view. After the merge occurs, changes to the model or related sections of the view are NOT automatically reflected in the view. Worse, any changes that the user makes to the view are not reflected in the model. This means that the developer has to write code that constantly syncs the view with the model and the model with the view.

Data Binding in AngularJS Templates

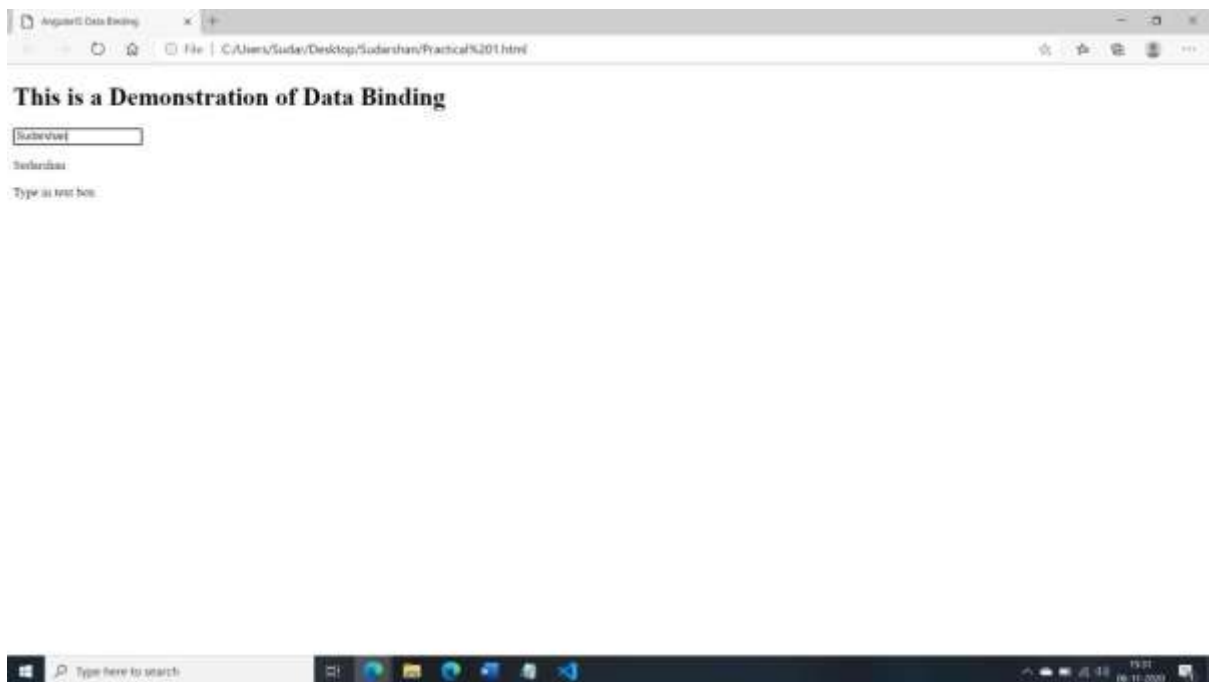
AngularJS templates work differently. First the template (which is the uncompiled HTML along with any additional markup or directives) is compiled on the browser. The compilation step produces a live view. Any changes to the view are immediately reflected in the model, and any changes in the model are propagated to the view. The model is the single-source-of-truth for the application state, greatly simplifying the programming model for the developer. You can think of the view as simply an instant projection of your model.

Because the view is just a projection of the model, the controller is completely separated from the view and unaware of it. This makes testing a snap because it is easy to test your controller in isolation without the view and the related DOM/browser dependency.

Code:

[illegible]

Output:



Practical 2 : AngularJS Directives

What are Directives in AngularJS?

- ❖ AngularJS lets you extend HTML with new attributes called Directives.
- ❖ AngularJS has a set of built-in directives which offers functionality to your applications.
- ❖ AngularJS also lets you define your own directives.

Most of the directives in AngularJS are starting with **ng-** where ng stands for Angular. AngularJS includes various built-in directives. In addition to this, you can create custom directives for your application.

ng-app

The ng-app directive initializes AngularJS and makes the specified element a root element of the application. Visit [ng-app](#) section for more information.

ng-init

The ng-init directive can be used to initialize variables in AngularJS application.

The following example demonstrates ng-init directive that initializes variable of string, number, array, and object.

ng-model

The ng-model directive is used for two-way data binding in AngularJS. It binds `<input>`, `<select>` or `<textarea>` elements to a specified property on the `$scope` object. So, the value of the element will be the value of a property and vice-versa.

ng-bind

The ng-bind directive binds the model property declared via `$scope` or ng-model directive or the result of an expression to the HTML element. It also updates an element if the value of an expression changes.

ng-repeat

The ng-repeat directive repeats HTML once per each item in the specified array collection.

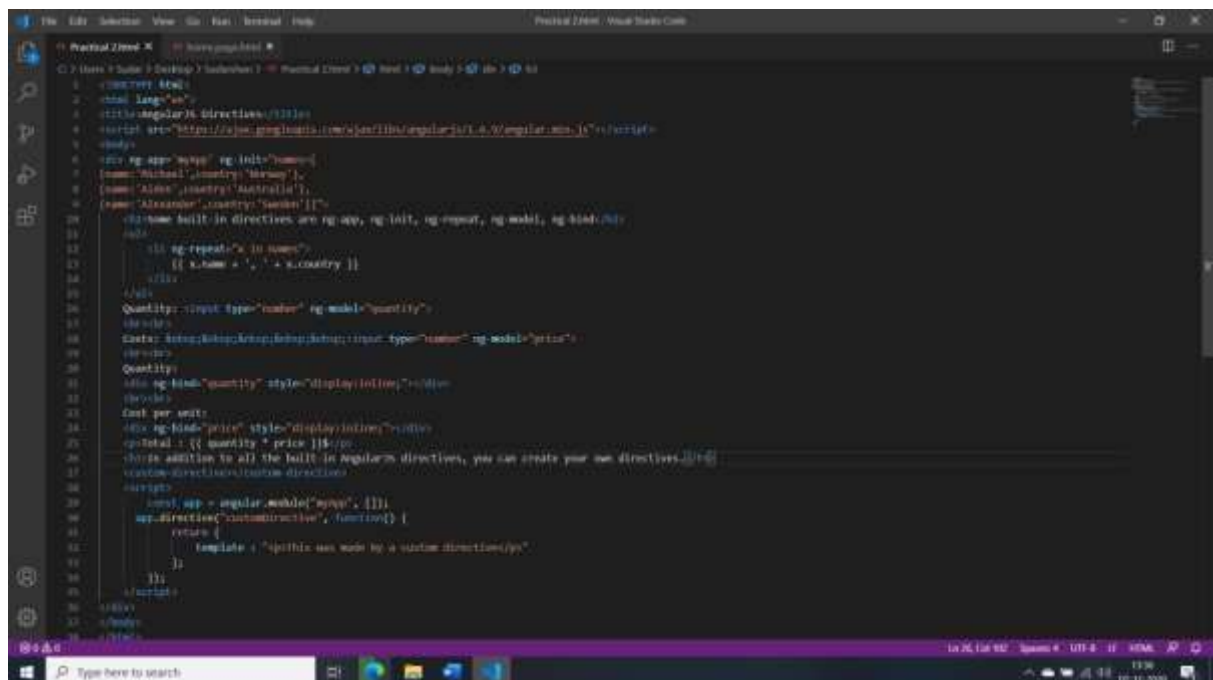
Directive Syntax

AngularJS directives can be applied to DOM elements in many ways. It is not mandatory to use **ng-** syntax only.

Directive can start with **x-** or **data-** for example ng-model directive can be written as data-ng-model or x-ng-model.

Also, the - in the directive can be replaced with : or _ or both. For example, ng-model can be written as ng_model or ng:model. It can also be a mix with **data-** or **x-** .

Code:



```
1 <!--country.html-->
2 <html lang="en">
3 <title>AngularJS directives</title>
4 <script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.4.9/angular.min.js"></script>
5 </script>
6 <div ng-app="myapp" ng-init="countries=[
7   {name:'Michael',country:'Norway'},
8   {name:'Alexa',country:'Australia'},
9   {name:'Alexander',country:'Sweden'}]>
10 </div>
11 <!--some built-in directives are ng-app, ng-init, ng-repeat, ng-model, ng-bind, etc-->
12 <div>
13   <!-- ng-repeat: 'x' in 'countries' -->
14   <div ng-repeat="x in countries">
15     {{ x.name + ', ' + x.country }}
16   </div>
17 </div>
18 <div>
19   <!-- Quantity: <input type="number" ng-model="quantity"> -->
20   <input type="text" value="1" />
21   <div>
22     <!-- Enter: <input type="text" ng-model="price"> -->
23     <input type="text" value="1" />
24   </div>
25   <div>
26     <!-- Quantity: -->
27     <div ng-bind="quantity" style="display:inline"></div>
28     <div></div>
29     <div>
30       <!-- first per unit -->
31       <div ng-bind="price" style="display:inline"></div>
32       <div></div>
33       <div>
34         <!-- total: {{ quantity * price }}$ -->
35         <div></div>
36       </div>
37     </div>
38   </div>
39 </div>
40 <!-- In addition to all the built-in AngularJS directives, you can create your own directives. -->
41 <!-- custom-directive/custom-directive -->
42 <div>
43   <!-- myapp -->
44   <div>
45     <!-- customDirective -->
46     <div>
47       <!-- template -->
48       <div></div>
49     </div>
50   </div>
51 </div>
```

Output:



Practical 3 : AngularJS Controllers

What are Controllers in AngularJS?

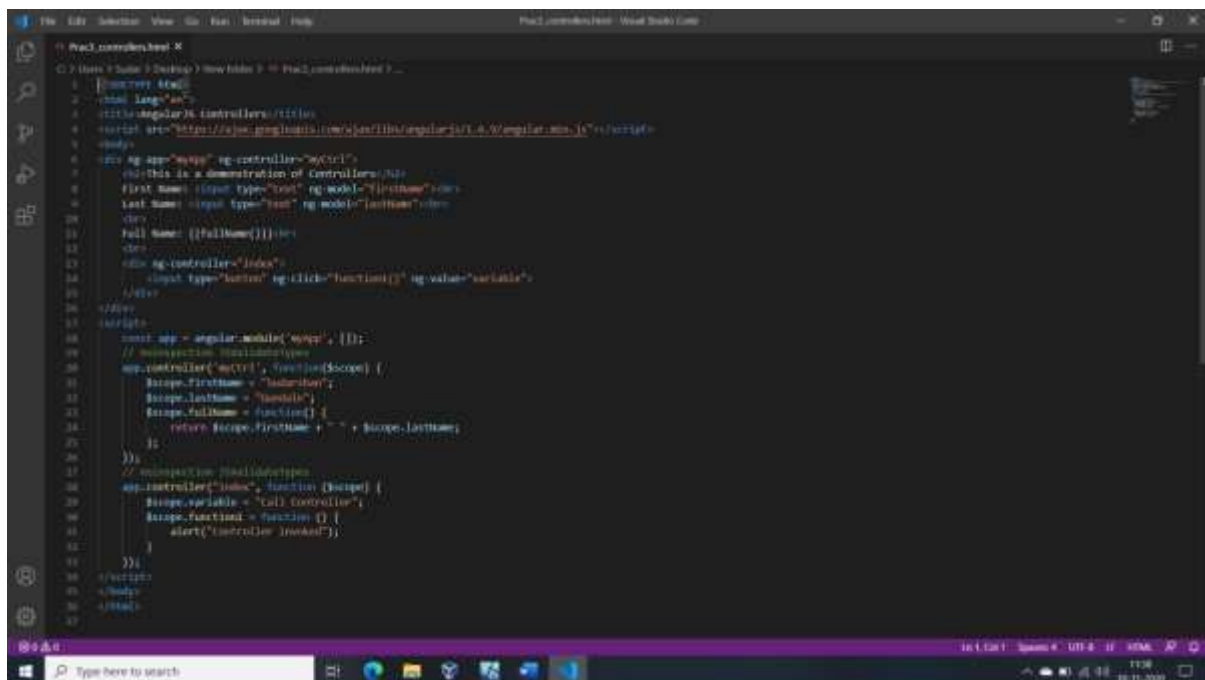
AngularJS application mainly relies on controllers to control the flow of data in the application. A controller is defined using ng-controller directive. A controller is a JavaScript object that contains attributes/properties, and functions. Each controller accepts \$scope as a parameter, which refers to the application/module that the controller needs to handle.

The controller in AngularJS is a JavaScript function that maintains the application data and behavior using \$scope object.

You can attach properties and methods to the \$scope object inside a controller function, which in turn will add/update the data and attach behaviours to HTML elements. The \$scope object is a glue between the controller and HTML.

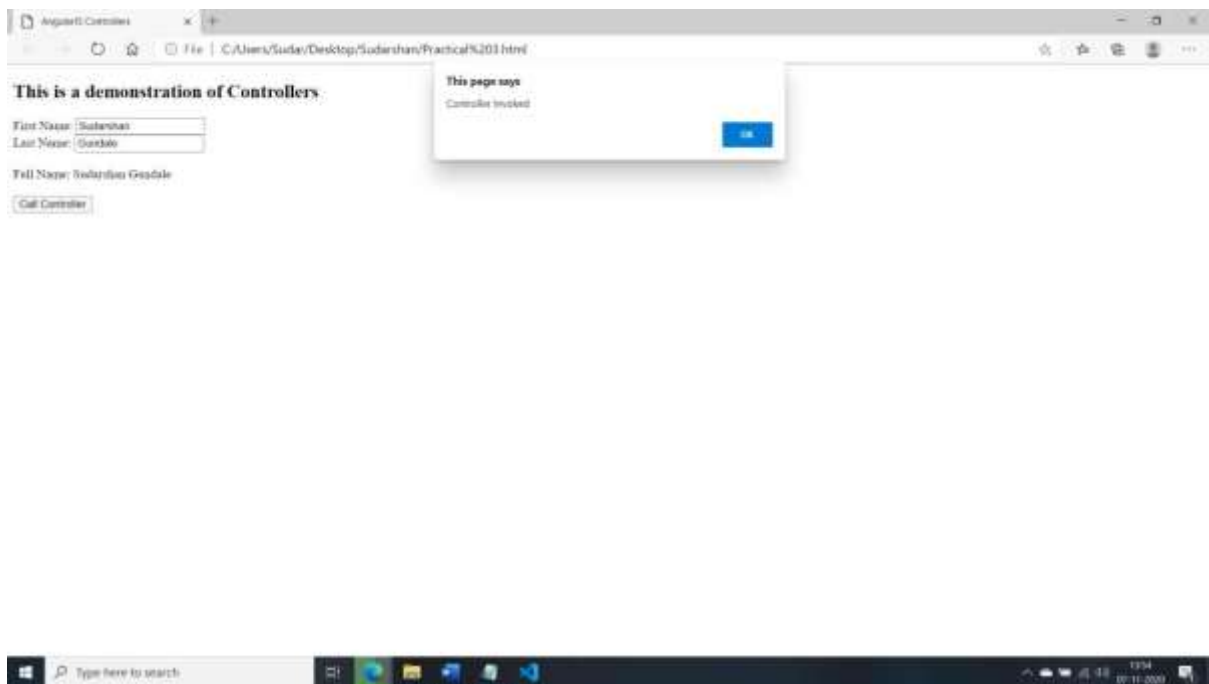
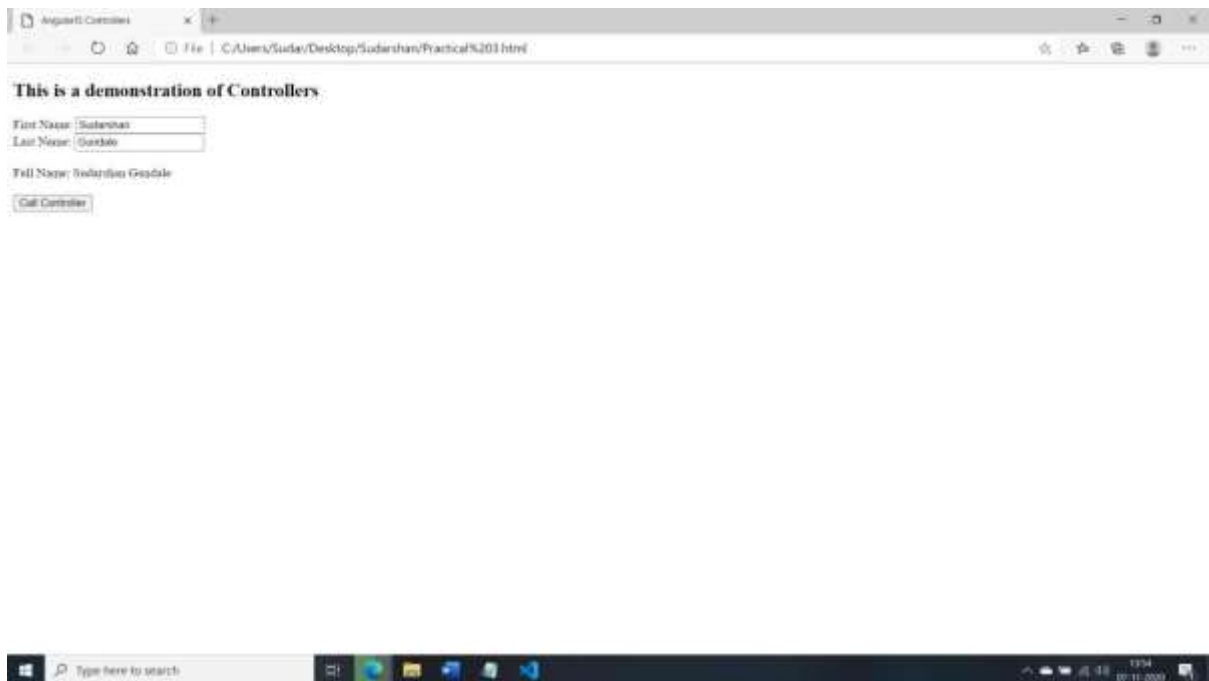
The ng-controller directive is used to specify a controller in HTML element, which will add behavior or maintain the data in that HTML element and its child elements.

Code:

A screenshot of a code editor window titled 'Prac3.controllers.html'. The code defines an AngularJS application with two controllers. The first controller, 'myCtrl', is associated with the 'myCtrl' directive and manages 'firstName' and 'lastName' inputs, displaying their concatenated value as 'fullName'. The second controller, 'index', is associated with the 'index' directive and contains a 'click' event listener that alerts the 'variable' property of the scope. The code is as follows:

```
1 <!DOCTYPE html>
2 <html lang="en">
3 <title>AngularJS controllers</title>
4 <script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.4.9/angular.min.js"></script>
5 <body>
6 <div ng-app="myapp" ng-controller="myCtrl">
7   <!-- This is a demonstration of Controllers -->
8   First Name: <input type="text" ng-model="firstName">
9   Last Name: <input type="text" ng-model="lastName">
10
11   <div>
12     Full Name: {{fullName}}
13   </div>
14 </div>
15 <div ng-controller="index">
16   <input type="button" ng-click="function()" ng-value="variable">
17 </div>
18 </body>
19 </html>
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Output:



Practical 4: AngularJS Events

AngularJS includes certain directives which can be used to provide custom behavior on various DOM events, such as click, dblclick, mouseenter etc. You can add AngularJS event listeners to your HTML elements by using one or more of these directives:

- ng-blur,ng-change
- ng-click
- ng-copy
- ng-cut
- ng-dblclick
- ng-focus
- ng-keydown
- ng-keypress
- ng-keyup
- ng-mousedown
- ng-mouseenter
- ng-mouseleave
- ng-mousemove
- ng-mouseover
- ng-mouseup
- ng-paste

The event directives allows us to run AngularJS functions at certain user events.

An AngularJS event will not overwrite an HTML event, both events will be executed.

Mouse Events

Mouse events occur when the cursor moves over an element, in this order:

- ng-mouseover
- ng-mouseenter
- ng-mousemove
- ng-mouseleave

Or when a mouse button is clicked on an element, in this order:

- ng-mousedown
- ng-mouseup
- ng-click

Code:

```

1 </DOCTYPE html>
2 <html lang="en">
3 <title>AngularJS Events</title>
4 <script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.6.0/angular.min.js"></script>
5 <body>
6 <div ng-app="event">
7 <h2>This is a demonstration of Events</h2>
8 <div ng-controller="eventController" ng-init="value=0">
9 <div>{{value}}</div>
10 <button ng-click="value=value+1">Increment Number</button>
11 <hr>
12 <div ng-mouseover="mouseover()" ng-mouseleave="mouseleave()" style="width: fit-content; cursor: pointer;">{{text}}</div>
13 <button ng-click="show()">Toggle Division</button>
14 <div ng-show="showNames" ng-init="names=[
15 {name:'Sudarshan',country:'India'},
16 {name:'Vasu',country:'Sweden'},
17 {name:'Nishu',country:'Denmark'}]>
18 <div>
19 <div ng-repeat="x in names">
20 <div>{{ x.name + ', ' + x.country }}
21 </div>
22 </div>
23 </div>
24 <div ng-mousemove="move($event)" style="width: fit-content">Move cursor over this text area</div>
25 <p>Coordinates: {{x + ', ' + y}}</p>
26 </div>
27 </div>

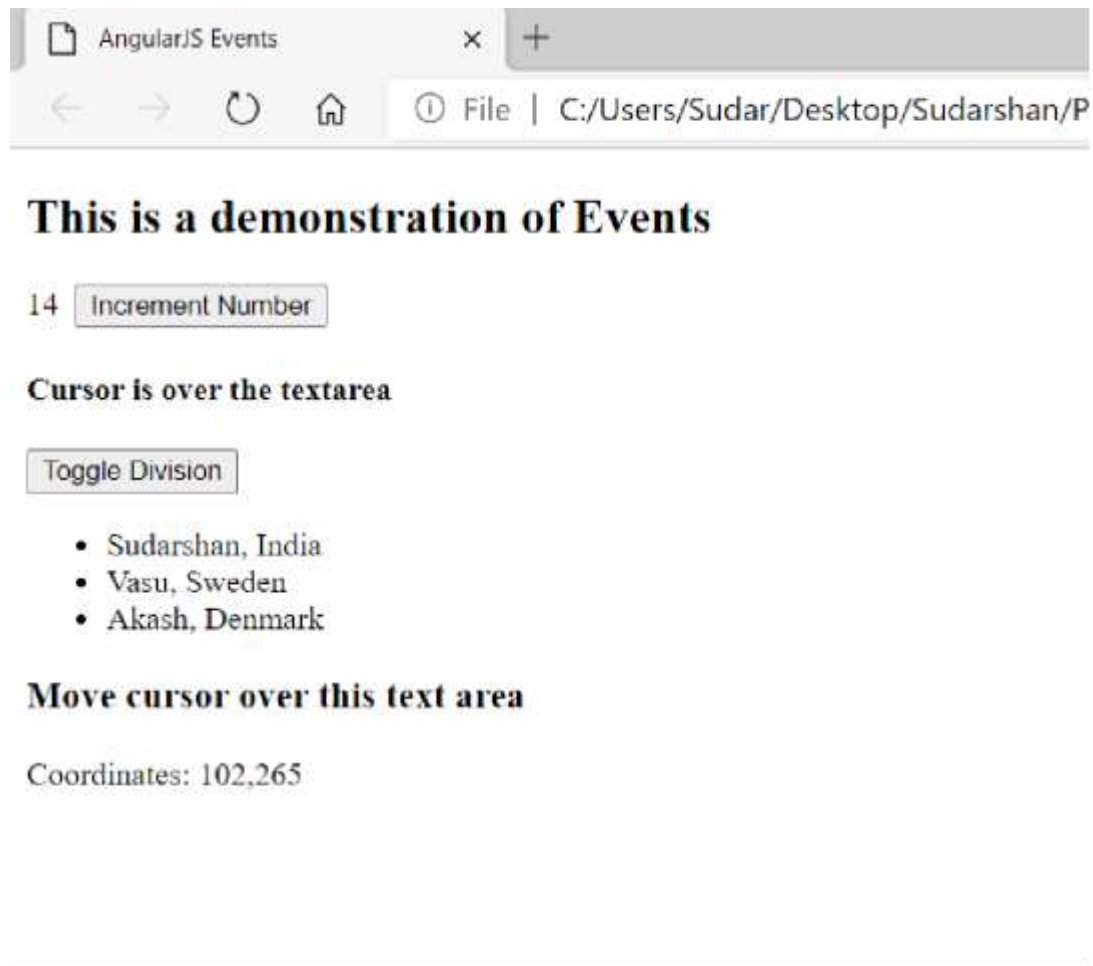
```

```

27 </div>
28 <script>
29   const app = angular.module('event', []);
30   // noinspection JSValidateTypes
31   app.controller('eventController1', function ($scope) {
32     $scope.text = "Hover the cursor over this text";
33     $scope.mouseover = function() {
34       $scope.text = "Cursor is over the textarea";
35     }
36     $scope.mouseleft = function() {
37       $scope.text = "Cursor is not over the textarea";
38     }
39     $scope.showNames = false;
40     $scope.show = function() {
41       $scope.showNames = !$scope.showNames;
42     }
43     $scope.move = function(event_object) {
44       $scope.x = event_object.clientX;
45       $scope.y = event_object.clientY;
46     }
47   });
48 </script>
49 </body>
50 </html>
51

```

Output:



Practical 5: Ionic Create and Build First Project

What is a hybrid app?

Like native apps, run on the device, and are written with web technologies (HTML5, CSS and JavaScript). Hybrid apps run inside a native container, and leverage the device's browser engine (but not the browser) to render the HTML and process the JavaScript locally. A web-to-native abstraction layer enables access to device capabilities that are not accessible in Mobile Web applications, such as the accelerometer, camera and local storage.

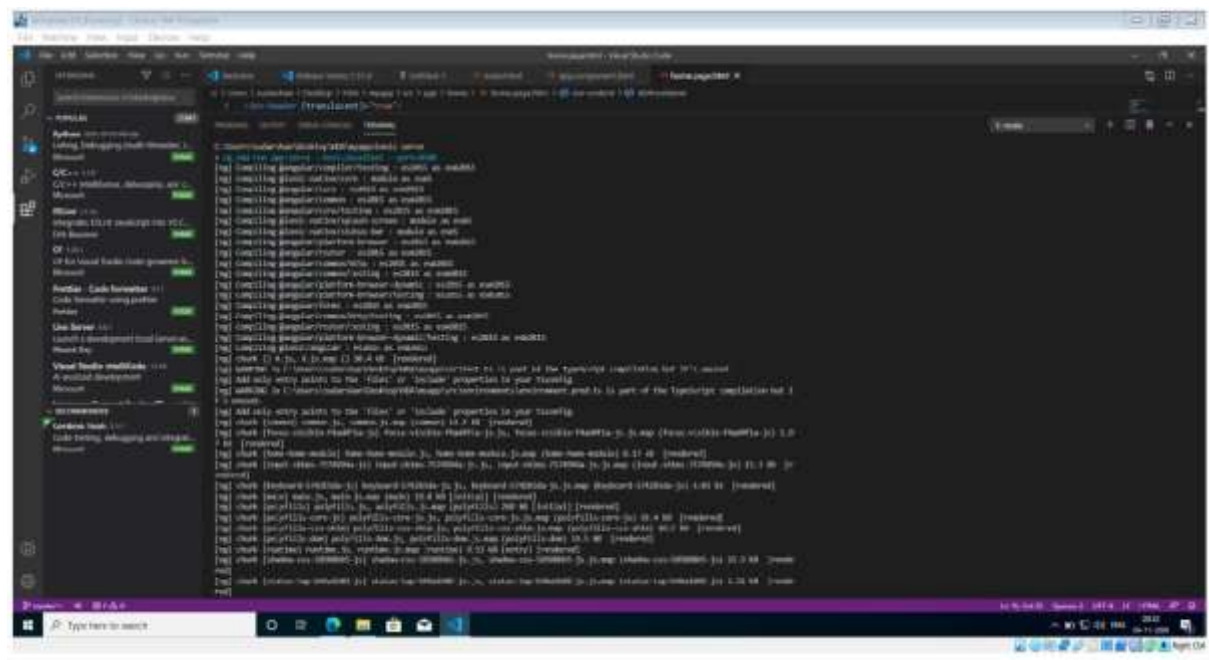
Requirements:

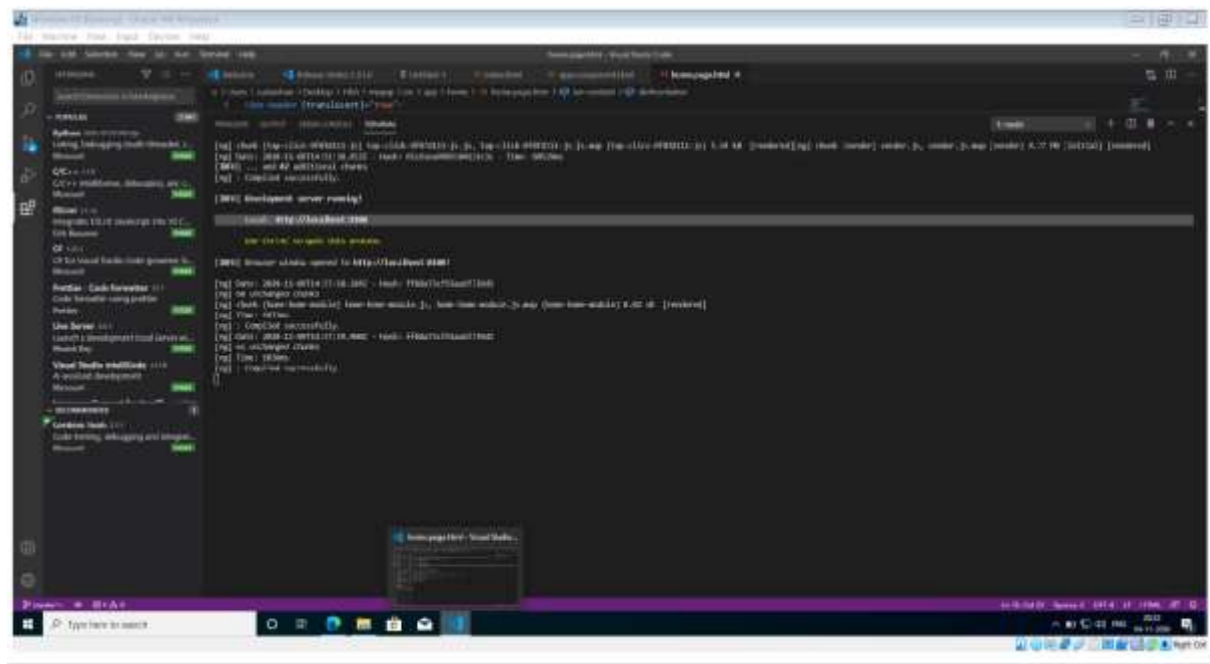
Node.js with npm in path

Steps:

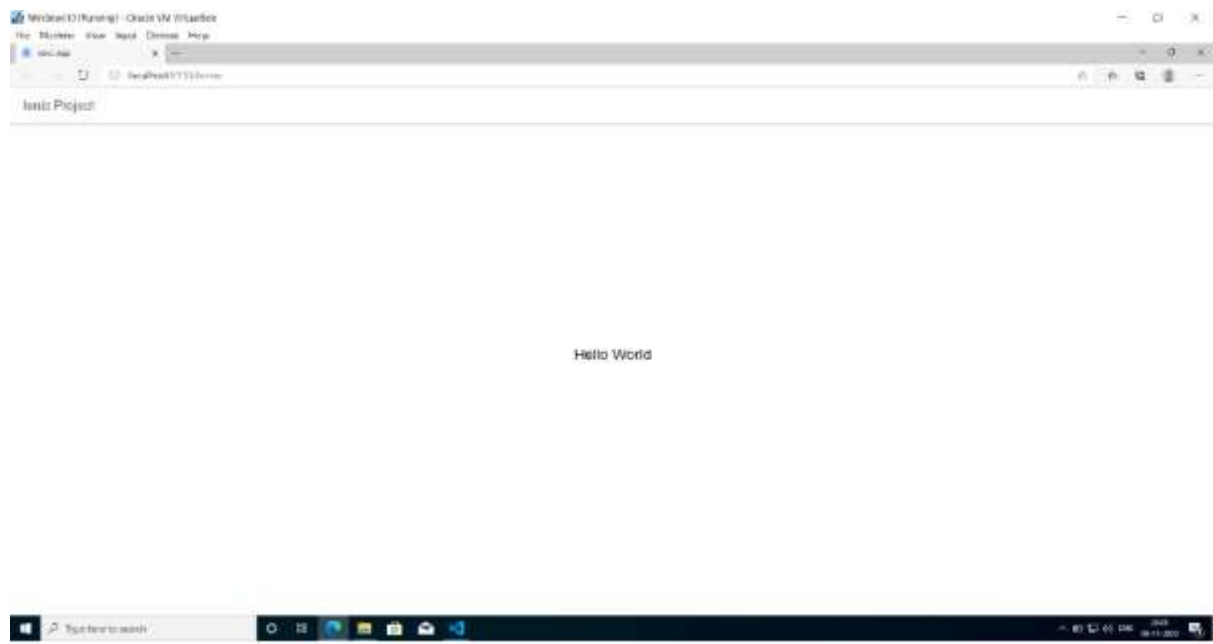
1. Open command prompt as administrator
2. Run **npm install -g ionic**
3. Create a folder for your ionic project by running **md <folder_name>**
4. Navigate to the folder by running **cd <folder_name>**
5. To create an ionic app run **ionic start <app_name> blank**
6. Then it will ask to choose a framework so choose **Angular JS**
7. Navigate to the folder by running **cd <app_name>**
8. Then to start running the ionic web page on the server type **ionic serve**
9. To access the web page, go on **http://localhost:810**

Code:





Output:



Practical 6: Ionic Adding Cordova Android Platform

What is Cordova?

Apache Cordova is an open-source mobile development framework. It allows you to use standard web technologies - HTML5, CSS3, and JavaScript for cross-platform development. Applications execute within wrappers targeted to each platform, and rely on standards-compliant API bindings to access each device's capabilities such as sensors, data, network status, etc. Cordova can be used as an integration for Ionic to export Ionic web apps to Native mobile applications like an Android APK.

Requirements:

1. Java 8 in path and JAVA_HOME set
2. Android SDK with ANDROID_SDK_ROOT set
3. Gradle in path

Steps:

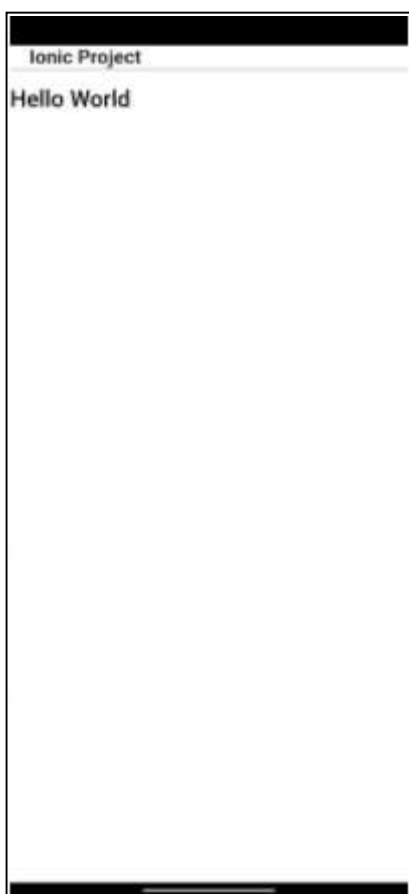
1. Install cordova resources by running **npm install -g cordova-res**
2. To add support for the Android platform run **ionic cordova platform add android**
3. To build a debug Android APK run **ionic cordova build android**
4. Install in your device from **ionic cordova platform add android {project_root}\platforms\android\app\build\outputs\apk\debug**

```
ionic cordova.platform.add android
Using cordova-fetch for cordova-android@9.0.0
Adding android project...
Creating Cordova project for the Android platform:
  Path: platforms\android
  Package: io.ionic.starter
  Name: MyApp
  Activity: MainActivity
  Android target: android-29
Subproject Path: CordovaLib
Subproject Path: app
Android project created with cordova-android@9.0.0
Plugin 'cordova-plugin-whitelist' found in config.xml... Migrating it to package.json
Plugin 'cordova-plugin-statusbar' found in config.xml... Migrating it to package.json
Plugin 'cordova-plugin-device' found in config.xml... Migrating it to package.json
Plugin 'cordova-plugin-splashscreen' found in config.xml... Migrating it to package.json
Plugin 'cordova-plugin-ionic-webview' found in config.xml... Migrating it to package.json
Plugin 'cordova-plugin-ionic-keyboard' found in config.xml... Migrating it to package.json
Discovered plugin 'cordova-plugin-whitelist'. Adding it to the project
Installing 'cordova-plugin-whitelist' for android
This plugin is only applicable for versions of cordova-android greater than 4.0. If you have a previous platform version, you do *not* need this plugin since the whitelist will be built in.
Adding cordova-plugin-whitelist to package.json
Discovered plugin 'cordova-plugin-statusbar'. Adding it to the project
Installing 'cordova-plugin-statusbar' for android
Adding cordova-plugin-statusbar to package.json
Discovered plugin 'cordova-plugin-device'. Adding it to the project
Installing 'cordova-plugin-device' for android
Adding cordova-plugin-device to package.json
Discovered plugin 'cordova-plugin-splashscreen'. Adding it to the project
Installing 'cordova-plugin-splashscreen' for android
Adding cordova-plugin-splashscreen to package.json
Discovered plugin 'cordova-plugin-ionic-webview'. Adding it to the project
Installing 'cordova-plugin-ionic-webview' for android
```



```
Subproject Path: CordovaLib
Subproject Path: app
Adding cordova-plugin-ionic-webview to package.json
Discovered plugin "cordova-plugin-ionic-keyboard". Adding it to the project
Installing "cordova-plugin-ionic-keyboard" for android
Adding cordova-plugin-ionic-keyboard to package.json
> ionic cordova resources android --force
> cordova-res.cmd android
[cordova-res] Generated 18 resources for Android
[cordova-res] Wrote to config.xml
```

Output:




```
PROBLEMS OUTPUT TERMINAL CONSOLE
C:\Users\subash\Desktop\NDA\page_test>ionic g page Page
> ng-add @angular/core@10.0.0 --project=app
I would you like to share anonymous usage data about this project with the Angular team at
Google under Google's Privacy Policy at https://policies.google.com/privacy? For more
details and how to change this setting, see http://angular.io/analytics. (y/n)

Thank you for sharing anonymous usage data. Would you change your mind, the following
command will disable this feature entirely:

  ng analytics project off

CREATE src/app/page/page-routing.module.ts (440 bytes)
CREATE src/app/page/page.module.ts (465 bytes)
CREATE src/app/page/page.page.html (124 bytes)
CREATE src/app/page/page.page.spec.ts (144 bytes)
CREATE src/app/page/page.page.ts (152 bytes)
CREATE src/app/page/page.page.scss (0 bytes)
UPDATE src/app/app-routing.module.ts (287 bytes)
[OK] Generated page!
C:\Users\subash\Desktop\NDA\page_test>
```

Output:



Practical 8: Ionic Use Tabs Starter Template

What are Ionic Starter Templates?

Ionic Starter Templates are ready-to-go starter packs for your next Ionic app. Between all project types, there are three templates available: tabs: A tab-based layout sidemenu: A sidemenu based layout blank: An empty project with a single page We will be using 'tabs' in the practical

Steps:

1. Open command prompt as administrator
2. Create a folder for your ionic project by running `md <folder_name>`
3. Navigate to the folder by running `cd <folder_name>`
4. To create an ionic app run **ionic start <app_name> tabs**
5. Then it will ask to choose a framework so choose **Angular JS**
6. Navigate to the folder by running `cd <app_name>`
7. Then to start running the ionic web page on the server type **ionic serve**
8. To access the web page, go on <http://localhost:8100>

Code:

A screenshot of a code editor showing the HTML structure of an Ionic tabs application. The code is written in a dark-themed editor with line numbers on the left. It defines a root element with a class 'ion-tabs' and a 'translucent' attribute. Inside, there's an 'ion-header' with a 'collapse' attribute, followed by an 'ion-toolbar' containing an 'ion-title' with the text 'Tab 1'. Below the header is an 'ion-content' with a 'fullscreen' attribute, which contains an 'app-explore-container' with a 'name' attribute set to 'Tab 1'.

```
1 <!-- Root element -->
2 <div class="ion-tabs" translucent">
3   <ion-header>
4     <ion-title>
5       Tab 1
6     </ion-title>
7   </ion-header>
8
9   <ion-content [fullscreen]="true">
10     <ion-header collapse="condense">
11       <ion-toolbar>
12         <ion-title title="Tab 1">Tab 1</ion-title>
13       </ion-toolbar>
14     </ion-header>
15
16     <app-explore-container name="Tab 1"></app-explore-container>
17   </ion-content>
18 </div>
```

```

C:\Users\Nade\Desktop\Nade\sham\sham hdu
C:\Users\Nade\Desktop\Nade\sham\sham hdu
C:\Users\Nade\Desktop\Nade\sham\sham hdu: start starters task

Pick a framework!

Please select the javascript framework to use for your new app. To bypass this
prompt next time, supply a value for the --type option.

Framework: angular                               or to start another project here? yes
You are already in an Ionic project directory. Do you really want
to start another project here? no
Preparing directory .\starters in 2.10ms
Downloading and extracting ionic starter in 104.7ms
Integrate your new app with Capacitor to target native iOS and
Android? yes
> ionic integration enable > npm run <point> --> starters to build
starters
> npm run <1> --> <@capacitor/core>
npm notice created a lockfile as package-lock.json. You should co
mit this file.
+ @capacitor/core@3.1
added 2 packages from 2 contributors and audited 1 package in 0.
72s
found 0 vulnerabilities

> npm run <1> --> <@capacitor/core>
+ @capacitor/core@3.1
added 2 packages from 2 contributors and audited 2 packages in
1.25s
found 0 vulnerabilities

> capacitor add ionic starters in ionic starter --web-dir src --op
en
added 2 packages

```

```

The system cannot find the path specified.
C:\Users\Nade\Desktop\Nade\sham\sham hdu: start starters
C:\Users\Nade\Desktop\Nade\sham\sham hdu: start starters
> ionic run app --serve --host=localhost --port=8080
[ng] Compiling @angular/core : es2015 as es2015
[ng] Compiling @ionic-native/core : module as es2015
[ng] Compiling @angular/router/testing : es2015 as es2015
[ng] Compiling @angular/common : es2015 as es2015
[ng] Compiling @angular/core/testing : es2015 as es2015
[ng] Compiling @ionic-native/status-screen : module as es2015
[ng] Compiling @ionic-native/status-bar : module as es2015
[ng] Compiling @angular/platform-browser : es2015 as es2015
[ng] Compiling @angular/router : es2015 as es2015
[ng] Compiling @angular/common/http : es2015 as es2015
[ng] Compiling @angular/common/testing : es2015 as es2015
[ng] Compiling @angular/forms : es2015 as es2015
[ng] Compiling @angular/platform-browser/testing : es2015 as es2015
[ng] Compiling @angular/platform-browser-dynamic : es2015 as es2015
[ng] Compiling @angular/router/testing : es2015 as es2015
[ng] Compiling @angular/platform-browser-dynamic/testing : es2015 as es2015
[ng] Compiling @angular/router : es2015 as es2015
[ng] chunk (1) 0.js, 8.js.map (1) 36.4 KB [rendered]
[ng] warning in C:\Users\Nade\Desktop\Nade\sham\sham hdu\starters\src\index.ts is part of the typescript compilation but it's unused.
Add only entry points to the 'files' or 'include' properties in your tsconfig.
[ng] warning in C:\Users\Nade\Desktop\Nade\sham\sham hdu\starters\src\environment\environment.prod.ts is part of the typescript compilation but it's unused.
Add only entry points to the 'files' or 'include' properties in your tsconfig.
[ng] chunk (common) common.js, common.js.map (common) 20.4 KB [rendered]
[ng] chunk (focus-visible-f4adfa7a-3c) focus-visible-f4adfa7a-3c.js, focus-visible-f4adfa7a-3c.js.map (focus-visible-f4adfa7a-3c) 1.97 KB [rendered]
[ng] chunk (input-shim-5770924c-3d) input-shim-5770924c-3d.js, input-shim-5770924c-3d.js.map (input-shim-5770924c-3d) 15.3 KB [rendered]
[ng] chunk (keyboard-5d4b0b0a-3d) keyboard-5d4b0b0a-3d.js, keyboard-5d4b0b0a-3d.js.map (keyboard-5d4b0b0a-3d) 8.81 KB [rendered]
[ng] chunk (main) main.js, main.js.map (main) 10.7 KB [initial] [rendered]
[ng] chunk (polyfills) polyfills.js, polyfills.js.map (polyfills) 268 KB [initial] [rendered]
[ng] chunk (polyfills-core-3c) polyfills-core-3c.js, polyfills-core-3c.js.map (polyfills-core-3c) 12.4 KB [rendered]
[ng] chunk (polyfills-css-shim) polyfills-css-shim.js, polyfills-css-shim.js.map (polyfills-css-shim) 30.7 KB [rendered]
[ng] chunk (runtime) runtime.js, runtime.js.map (runtime) 0.61 KB [entry] [rendered]
[ng] chunk (shadow-css-58508865-3c) shadow-css-58508865-3c.js, shadow-css-58508865-3c.js.map (shadow-css-58508865-3c) 15.9 KB [rendered]
[ng] chunk (status-bar-b46a1b02-3c) status-bar-b46a1b02-3c.js, status-bar-b46a1b02-3c.js.map (status-bar-b46a1b02-3c) 1.51 KB [rendered]

```

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[ng] chunk (shadow-css-58508865-3c) shadow-css-58508865-3c.js, shadow-css-58508865-3c.js.map (shadow-css-58508865-3c) 15.9 KB [rendered]
[ng] chunk (status-bar-b46a1b02-3c) status-bar-b46a1b02-3c.js, status-bar-b46a1b02-3c.js.map (status-bar-b46a1b02-3c) 1.51 KB [rendered]
[ng] chunk (styles) styles.js, styles.js.map (styles) 41 KB [initial] [rendered]
[ng] chunk (swipe-back-53c5a7dd-3c) swipe-back-53c5a7dd-3c.js, swipe-back-53c5a7dd-3c.js.map (swipe-back-53c5a7dd-3c) 2.9 KB [rendered]
[ng] chunk (swiper-handle-95afcead-3c) swiper-handle-95afcead-3c.js, swiper-handle-95afcead-3c.js.map (swiper-handle-95afcead-3c) 208 KB [rendered]
[ng] chunk (labeled-label-module) labeled-label-module.js, labeled-label-module.js.map (labeled-label-module) 7.28 KB [rendered]
[ng] chunk (labeled-label-module) labeled-label-module.js, labeled-label-module.js.map (labeled-label-module) 7.28 KB [rendered]
[ng] chunk (tabs-tabs-module) tabs-tabs-module.js, tabs-tabs-module.js.map (tabs-tabs-module) 2.87 KB [rendered]
[ng] chunk (tabs-tabs-module) tabs-tabs-module.js, tabs-tabs-module.js.map (tabs-tabs-module) 2.87 KB [rendered]
[ng] chunk (tap-click-9f0fd111-3c) tap-click-9f0fd111-3c.js, tap-click-9f0fd111-3c.js.map (tap-click-9f0fd111-3c) 5.64 KB [rendered]
[ng] chunk (vendor) vendor.js, vendor.js.map (vendor) 4.77 MB [initial] [rendered]
[ng] Date: 2020-11-09T16:49:12.438Z - hash: f388554a2f64cb3684 - Time: 12189ms
[INFO] ... and 42 additional chunks
[ng] : compiled successfully.

[INFO] Development server running!

local: http://localhost:8080

Use Ctrl+C to quit this process

[INFO] Browser window opened to http://localhost:8080!

[ng] Date: 2020-11-09T16:49:12.507Z - hash: 5a5e9c0f77a9e972f0
[ng] 54 unchanged chunks
[ng] Time: 1600ms
[ng] : compiled successfully.

```

Output :

