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

(Affiliated To University Of Mumbai)

Reaccredited 'A' Grade by NAAC | ISO 9001:2015 Certified

CERTIFICATE

Name: Yash Purohit

Roll No: 379 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.

External Examiner

Mr. Gangashankar Singh
(Subject-In-Charge)

Date of Examination: (College Stamp)

Class: S.Y. B.Sc. IT Sem- III **Roll No: 379**

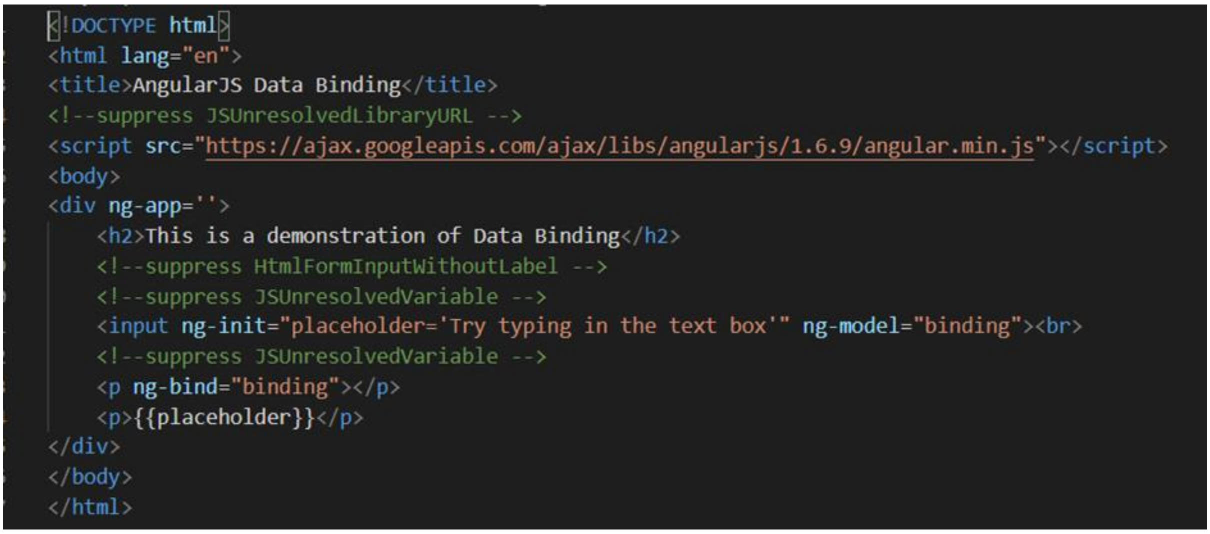
Subject: Hybrid Application Development
INDEX

Practical 1 : AngularJS Data Binding

What is Data Binding in AngularJS?

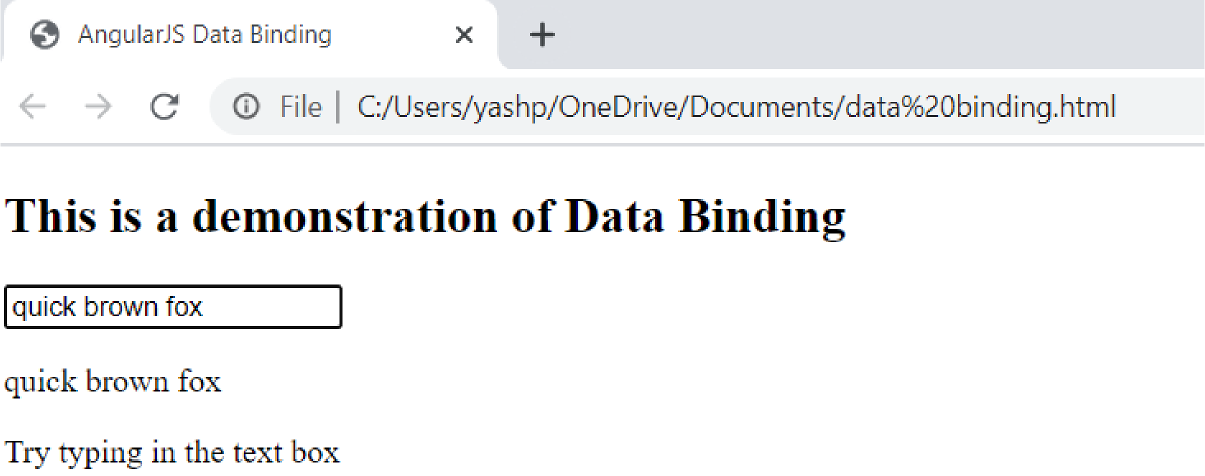
Data-binding in AngularJS apps is the automatic synchronization of data between the model and view components. While you could push values to and pull values from HTML, the application is easier to write, read, and maintain if you turn these tasks over to a binding framework. You simply declare bindings between binding sources, target HTML elements, and let the framework do the rest.

Code :



```
<!DOCTYPE html>
<html lang="en">
<title>AngularJS Data Binding</title>
<!--suppress JSUnresolvedLibraryURL -->
<script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.6.9/angular.min.js"></script>
<body>
<div ng-app=''>
    <h2>This is a demonstration of Data Binding</h2>
    <!--suppress HtmlFormInputWithoutLabel -->
    <!--suppress JSUnresolvedVariable -->
    <input ng-init="placeholder='Try typing in the text box'" ng-model="binding"><br>
    <!--suppress JSUnresolvedVariable -->
    <p ng-bind="binding"></p>
    <p>{{placeholder}}</p>
</div>
</body>
</html>
```

Output:



This is a demonstration of Data Binding

quick brown fox

quick brown fox

Try typing in the text box

-Practical 2 : AngularJS Directives

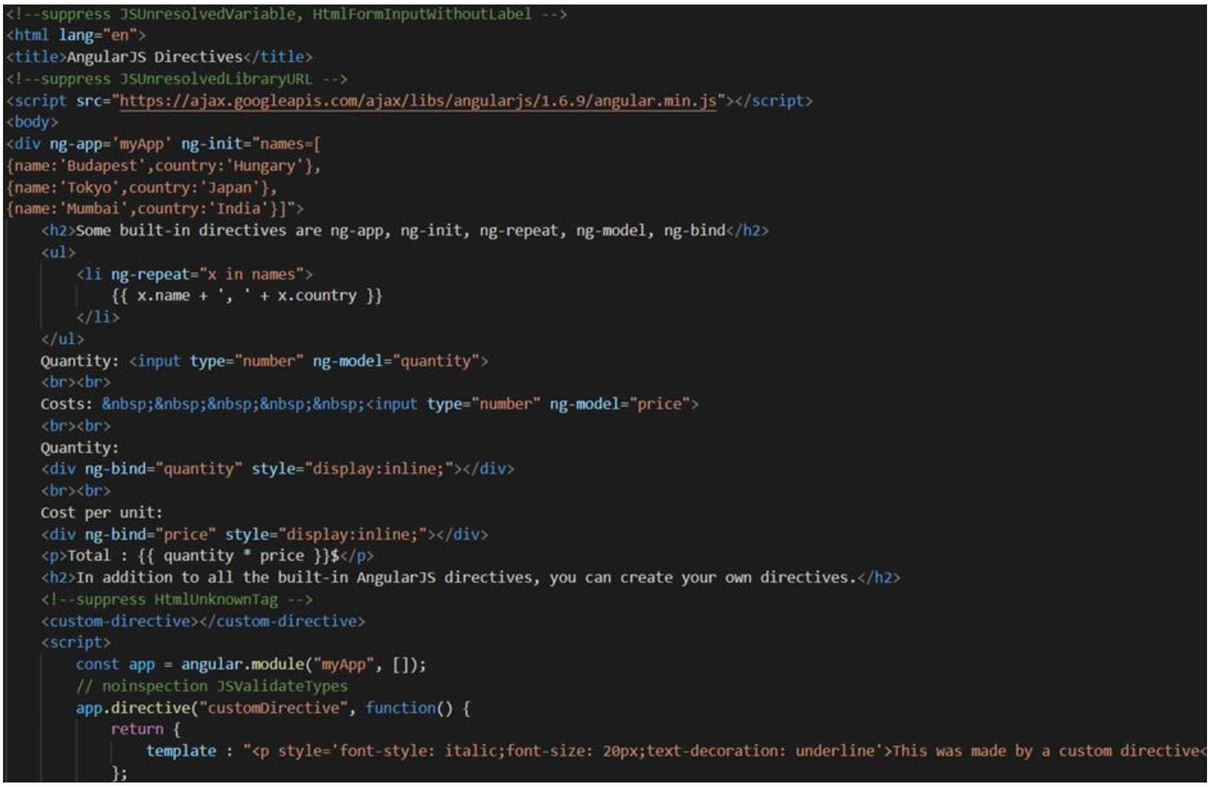
What are Directives in AngularJS?

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.

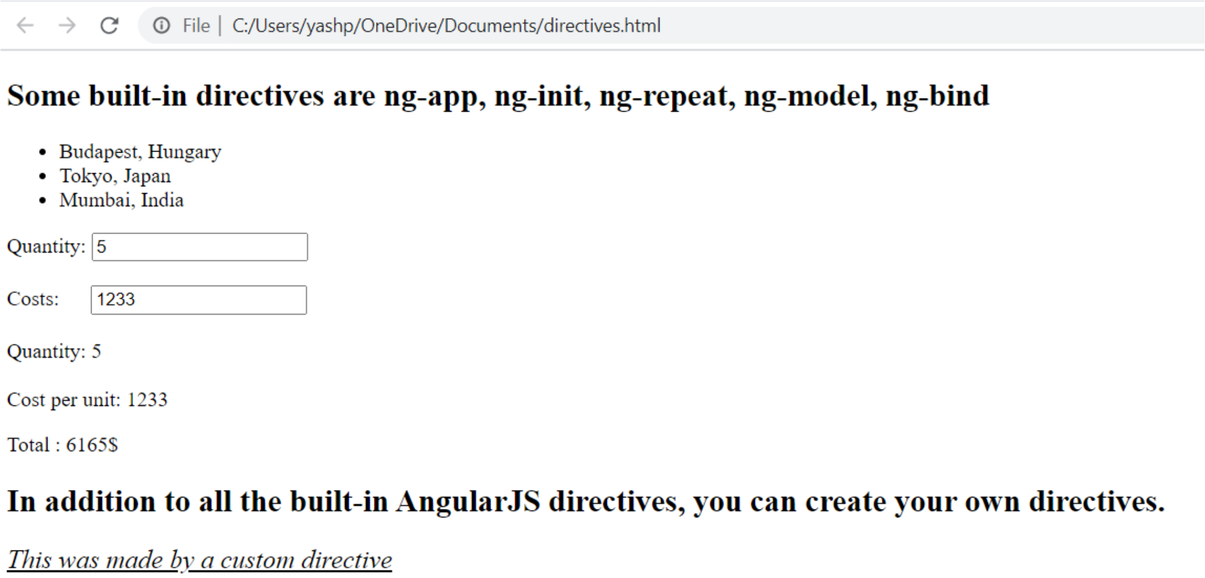
Code:



```
<!--suppress JSUnresolvedVariable, HtmlFormInputWithoutLabel -->
<html lang="en">
<title>AngularJS Directives</title>
<!--suppress JSUnresolvedLibraryURL -->
<script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.6.9/angular.min.js"></script>
<body>
<div ng-app='myApp' ng-init="names=[
{name:'Budapest',country:'Hungary'},
{name:'Tokyo',country:'Japan'},
{name:'Mumbai',country:'India'}]">
    <h2>Some built-in directives are ng-app, ng-init, ng-repeat, ng-model, ng-bind</h2>
    <ul>
        <li ng-repeat="x in names">
            {{ x.name + ', ' + x.country }}
        </li>
    </ul>
    Quantity: <input type="number" ng-model="quantity">
    <br><br>
    Costs: &nbsp;&nbsp;&nbsp;&nbsp;&nbsp;<input type="number" ng-model="price">
    <br><br>
    Quantity:
    <div ng-bind="quantity" style="display:inline;"></div>
    <br><br>
    Cost per unit:
    <div ng-bind="price" style="display:inline;"></div>
    <p>Total : {{ quantity * price }}$</p>
    <h2>In addition to all the built-in AngularJS directives, you can create your own directives.</h2>
    <!--suppress HtmlUnknownTag -->
    <custom-directive></custom-directive>
    <script>
        const app = angular.module("myApp", []);
        // noinspection JSValidateTypes
        app.directive("customDirective", function() {
            return {
                template : "<p style='font-style: italic;font-size: 20px;text-decoration: underline'>This was made by a custom directive<
            };
```

Output:

-Values entered



Some built-in directives are ng-app, ng-init, ng-repeat, ng-model, ng-bind

- Budapest, Hungary
- Tokyo, Japan
- Mumbai, India

Quantity: 5

Costs: 1233

Quantity: 5

Cost per unit: 1233

Total : 6165$

In addition to all the built-in AngularJS directives, you can create your own directives.

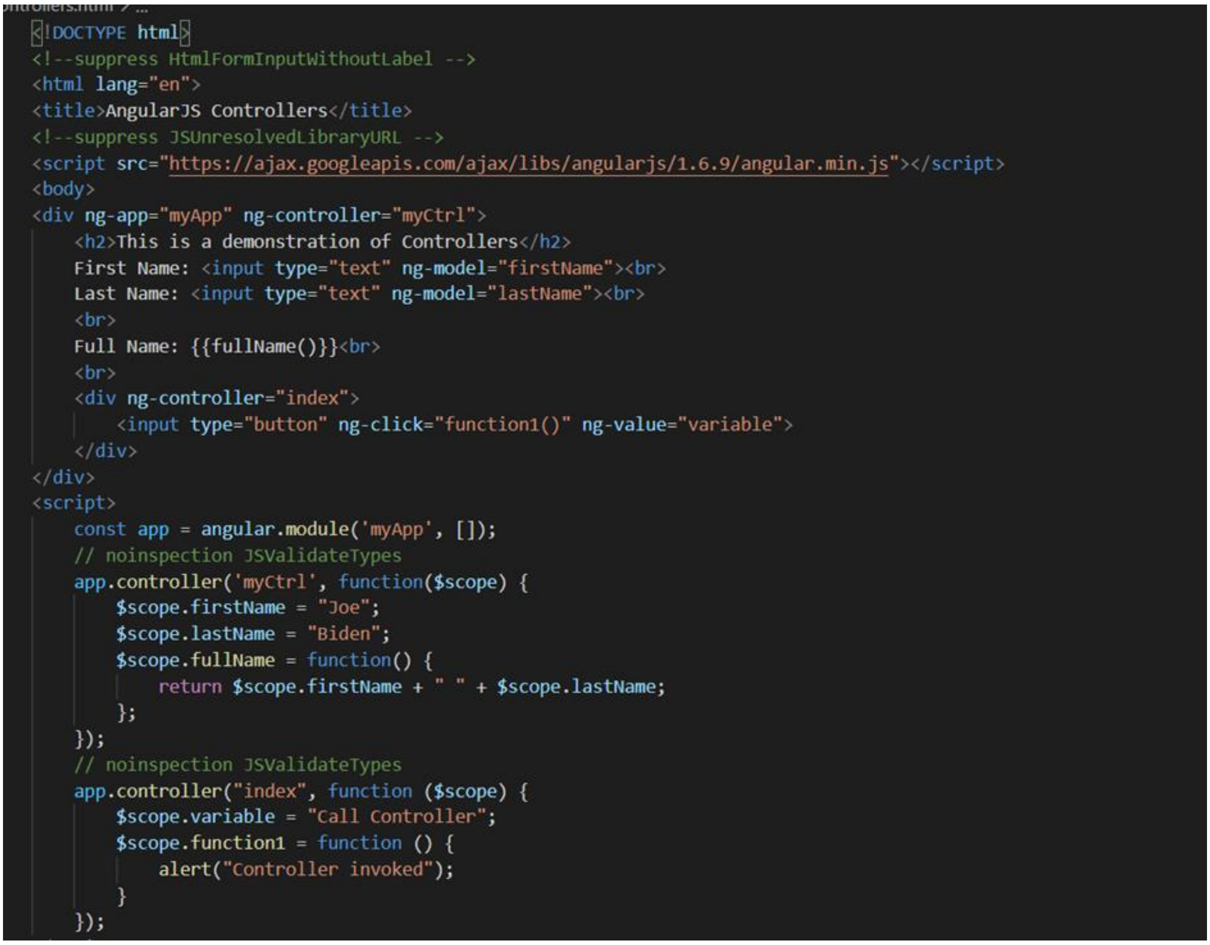
This was made by a custom directive

Practical 3 : AngularJS Controllers

What are Controllers in AngularJS?

AngularJS applications mainly rely 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.

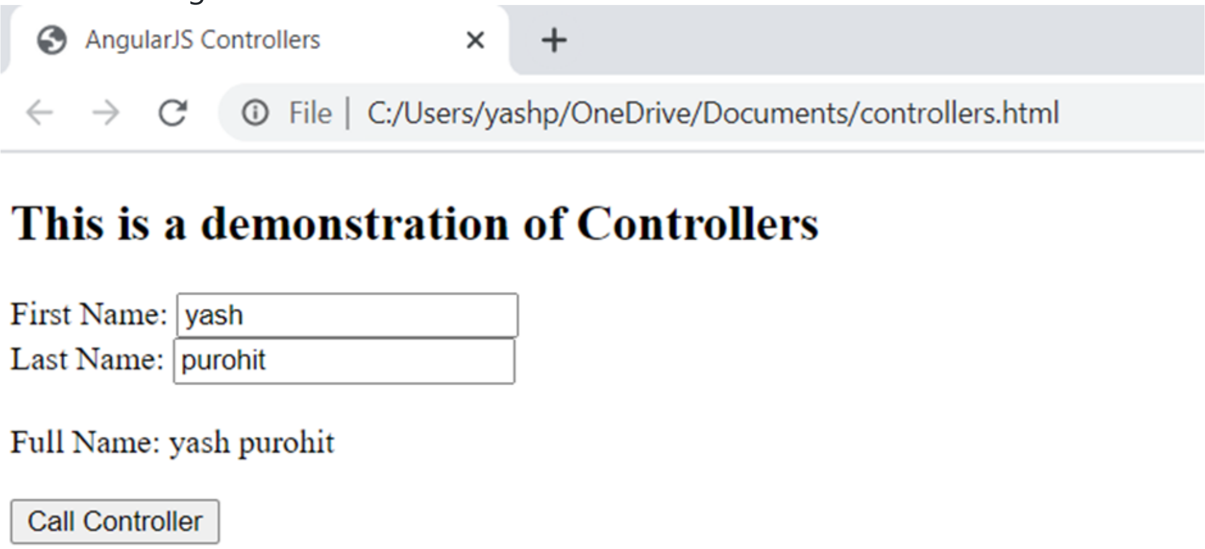
Code:



```
<!DOCTYPE html>
<!--suppress HtmlFormInputWithoutLabel -->
<html lang="en">
<title>AngularJS Controllers</title>
<!--suppress JSUnresolvedLibraryURL -->
<script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.6.9/angular.min.js"></script>
<body>
<div ng-app="myApp" ng-controller="myCtrl">
    <h2>This is a demonstration of Controllers</h2>
    First Name: <input type="text" ng-model="firstName"><br>
    Last Name: <input type="text" ng-model="lastName"><br>
    <br>
    Full Name: {{fullName()}}<br>
    <br>
    <div ng-controller="index">
        <input type="button" ng-click="function1()" ng-value="variable">
    </div>
</div>
<script>
    const app = angular.module('myApp', []);
    // noinspection JSValidateTypes
    app.controller('myCtrl', function($scope) {
        $scope.firstName = "Joe";
        $scope.lastName = "Biden";
        $scope.fullName = function() {
            return $scope.firstName + " " + $scope.lastName;
        };
    });
    // noinspection JSValidateTypes
    app.controller("index", function ($scope) {
        $scope.variable = "Call Controller";
        $scope.function1 = function () {
            alert("Controller invoked");
        }
    });
```

Output:

-On initialising

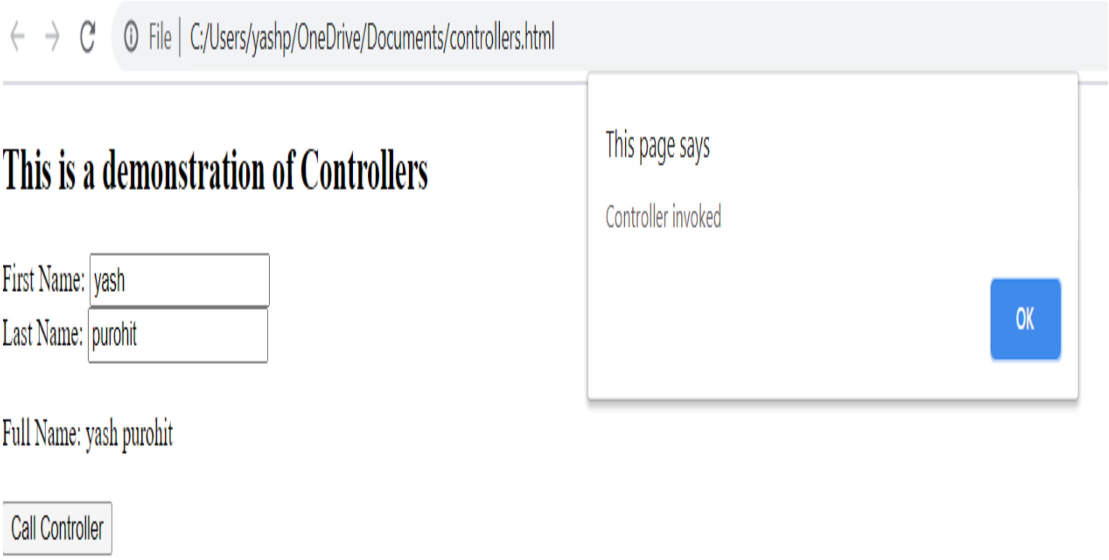


This is a demonstration of Controllers

First Name: yash
Last Name: purohit

Full Name: yash purohit

-After pressing the button



This is a demonstration of Controllers

First Name: yash
Last Name: purohit

Full Name: yash purohit

This page says

Controller invoked

Practical 4 : AngularJS Events

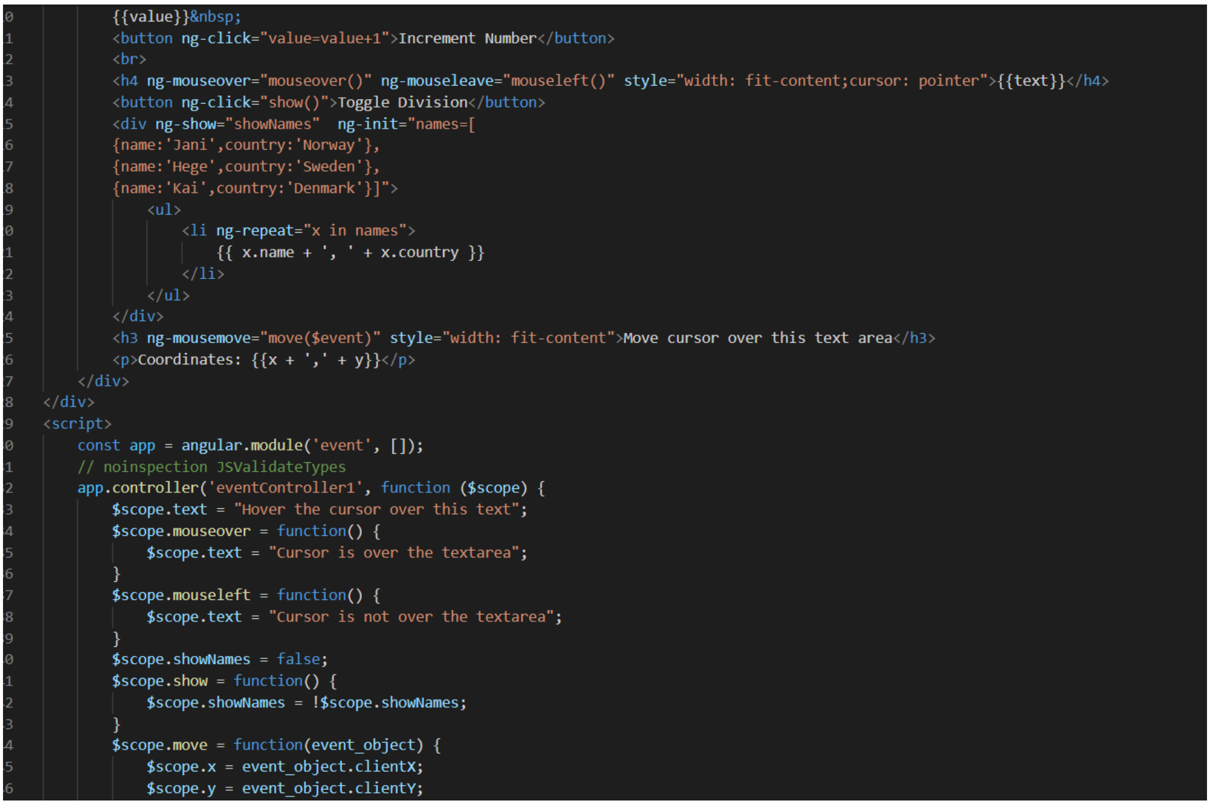
What are Events in AngularJS?

AngularJS includes certain directives which can be used to provide custom behavior on various DOM events, such as click, mouseover etc.

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

You can pass the $event object as an argument when calling the function. The $event object contains the browser's event object.

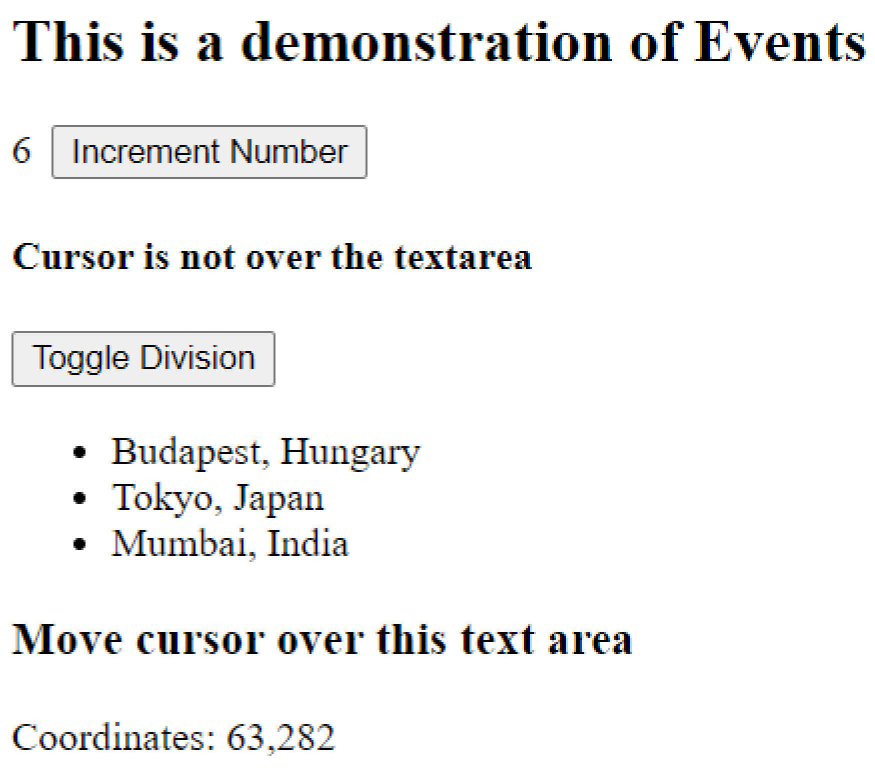
Code:



```
            {{value}}&nbsp;
            <button ng-click="value=value+1">Increment Number</button>
            <br>
            <h4 ng-mouseover="mouseover()" ng-mouseleave="mouseleft()" style="width: fit-content;cursor: pointer">{{text}}</h4>
            <button ng-click="show()">Toggle Division</button>
            <div ng-show="showNames"  ng-init="names=[
            {name:'Jani',country:'Norway'},
            {name:'Hege',country:'Sweden'},
            {name:'Kai',country:'Denmark'}]">
                <ul>
                    <li ng-repeat="x in names">
                        {{ x.name + ', ' + x.country }}
                    </li>
                </ul>
            </div>
            <h3 ng-mousemove="move($event)" style="width: fit-content">Move cursor over this text area</h3>
            <p>Coordinates: {{x + ',' + y}}</p>
        </div>
    </div>
    <script>
        const app = angular.module('event', []);
        // noinspection JSValidateTypes
        app.controller('eventController1', function ($scope) {
            $scope.text = "Hover the cursor over this text";
            $scope.mouseover = function() {
                $scope.text = "Cursor is over the textarea";
            }
            $scope.mouseleft = function() {
                $scope.text = "Cursor is not over the textarea";
            }
            $scope.showNames = false;
            $scope.show = function() {
                $scope.showNames = !$scope.showNames;
            }
            $scope.move = function(event_object) {
                $scope.x = event_object.clientX;
                $scope.y = event_object.clientY;
```

Output:

-After triggering all events



This is a demonstration of Events

6

Cursor is not over the textarea

- Budapest, Hungary
- Tokyo, Japan
- Mumbai, India

Move cursor over this text area

Coordinates: 63,282

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. How to create and web app in Ionic:

Requirements:

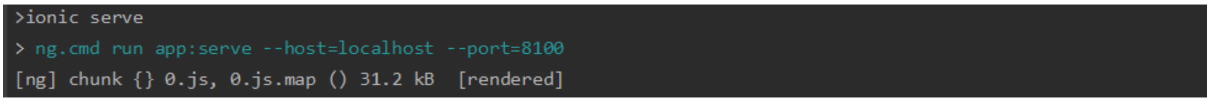
1. Node.js with npm in path

Steps:

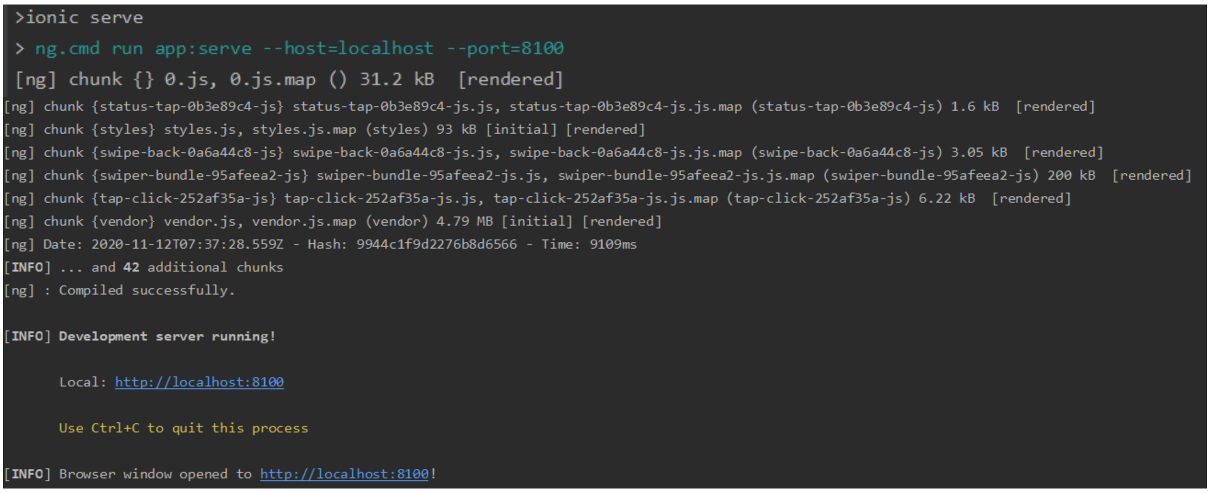
1. Open command prompt as administrator
2. Run `npm install -g ionic`
3. Create a folder for your ionic project by running `md <folder_name>`
4. Navigate to the folder by running `cd <folder_name>`
5. To create an ionic app run `ionic start <app_name> blank`
6. Then it will ask to choose a framework 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:8100

Output:

-Command Line (Step 8)

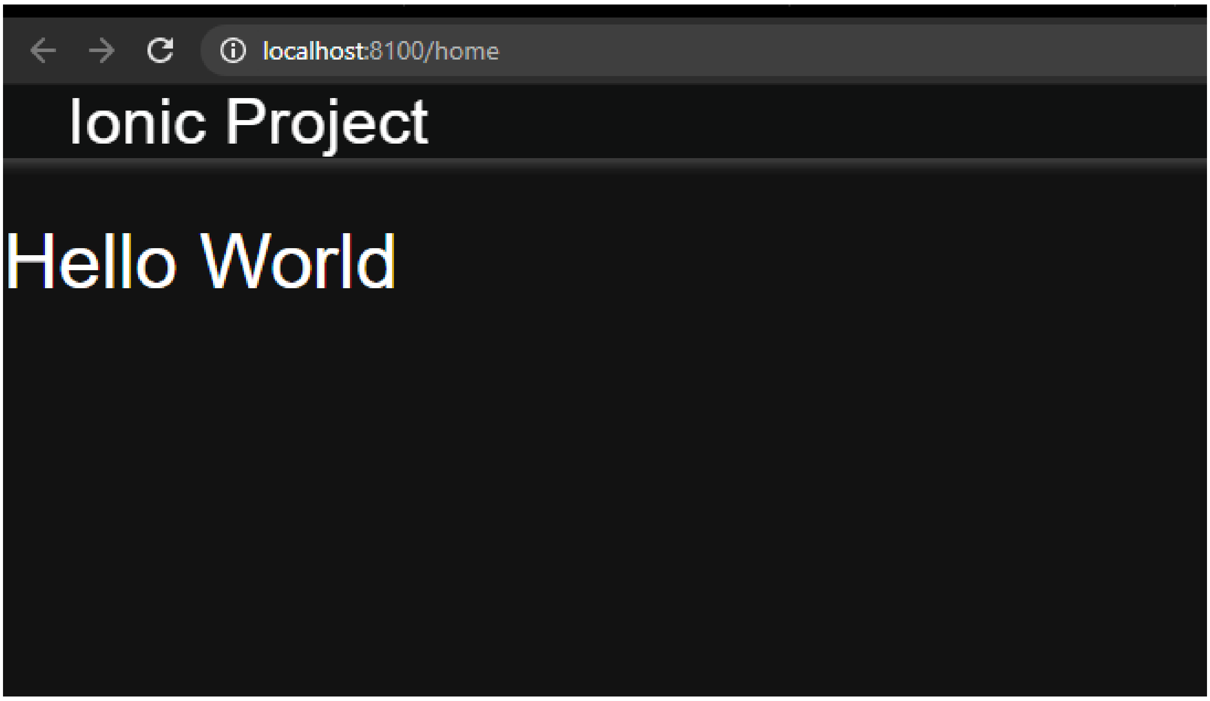


```
>ionic serve
> ng.cmd run app:serve --host=localhost --port=8100
[ng] chunk {} 0.js, 0.js.map () 31.2 kB  [rendered]
```



```
>ionic serve
> ng.cmd run app:serve --host=localhost --port=8100
[ng] chunk {} 0.js, 0.js.map () 31.2 kB  [rendered]
[ng] chunk {status-tap-0b3e89c4-js} status-tap-0b3e89c4-js.js, status-tap-0b3e89c4-js.js.map (status-tap-0b3e89c4-js) 1.6 kB  [rendered]
[ng] chunk {styles} styles.js, styles.js.map (styles) 93 kB [initial] [rendered]
[ng] chunk {swipe-back-0a6a44c8-js} swipe-back-0a6a44c8-js.js, swipe-back-0a6a44c8-js.js.map (swipe-back-0a6a44c8-js) 3.05 kB  [rendered]
[ng] chunk {swiper-bundle-95afeea2-js} swiper-bundle-95afeea2-js.js, swiper-bundle-95afeea2-js.js.map (swiper-bundle-95afeea2-js) 200 kB  [rendered]
[ng] chunk {tap-click-252af35a-js} tap-click-252af35a-js.js, tap-click-252af35a-js.js.map (tap-click-252af35a-js) 6.22 kB  [rendered]
[ng] chunk {vendor} vendor.js, vendor.js.map (vendor) 4.79 MB [initial] [rendered]
[ng] Date: 2020-11-12T07:37:28.559Z - Hash: 9944c1f9d2276b8d6566 - Time: 9109ms
[INFO] ... and 42 additional chunks
[ng] : Compiled successfully.

[INFO] Development server running!

       Local: http://localhost:8100

       Use Ctrl+C to quit this process

[INFO] Browser window opened to http://localhost:8100!
```

-Browser (Step 9)



Ionic Project

Hello World

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 an integration for Ionic to export Ionic web apps to Native mobile applications like an Android APK.

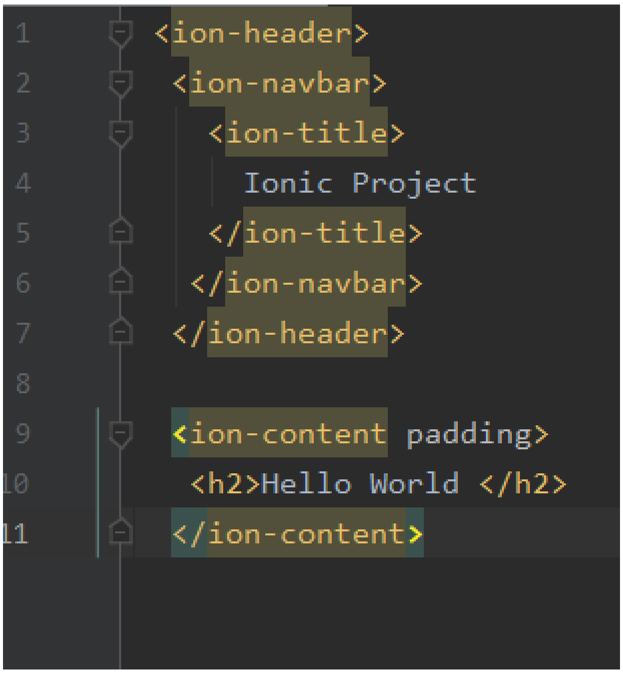
Requirements:

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 `app-debug.apk` in your device from `{project_root}\platforms\android\app\build\outputs\apk\debug`

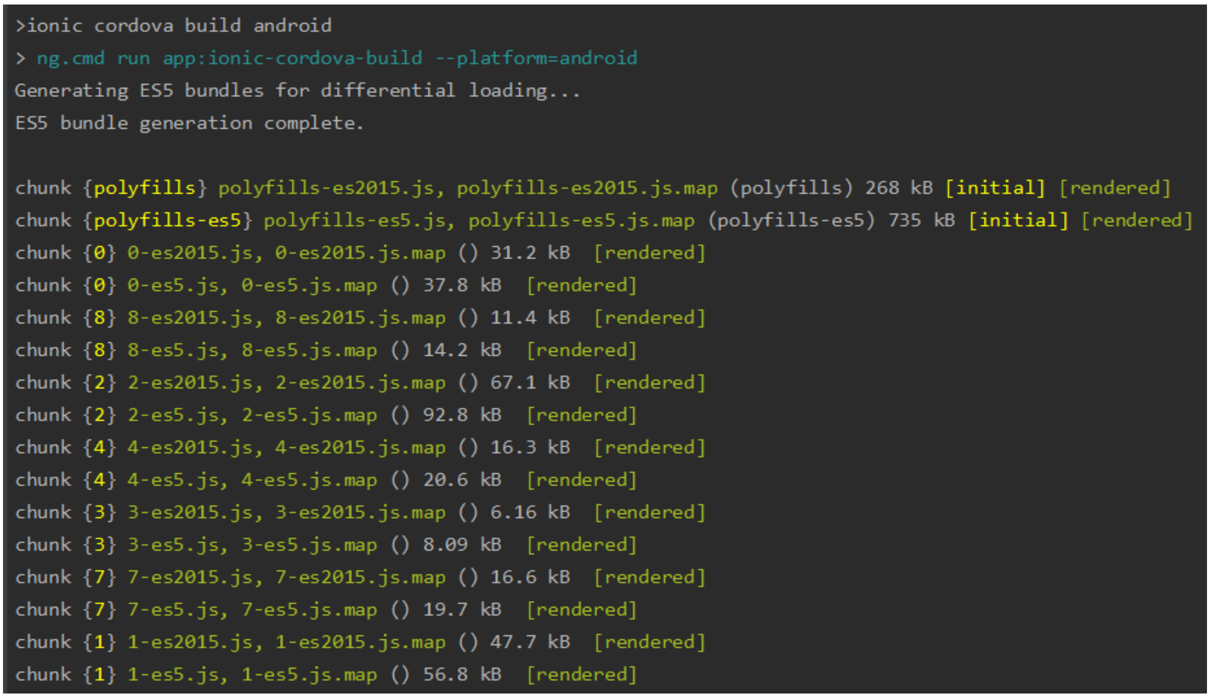
Code:



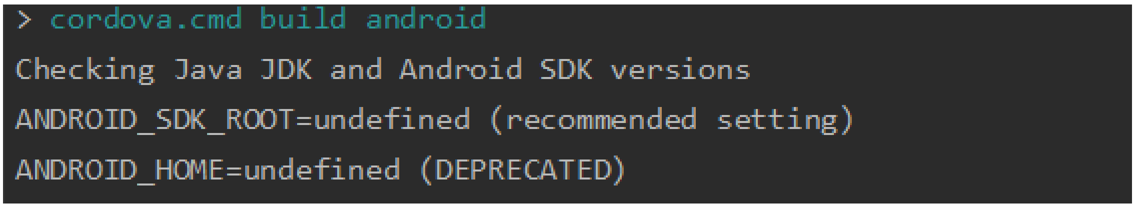
```
<ion-header>
 <ion-navbar>
   <ion-title>
     Ionic Project
   </ion-title>
  </ion-navbar>
 </ion-header>

 <ion-content padding>
  <h2>Hello World </h2>
 </ion-content>
```

Output:

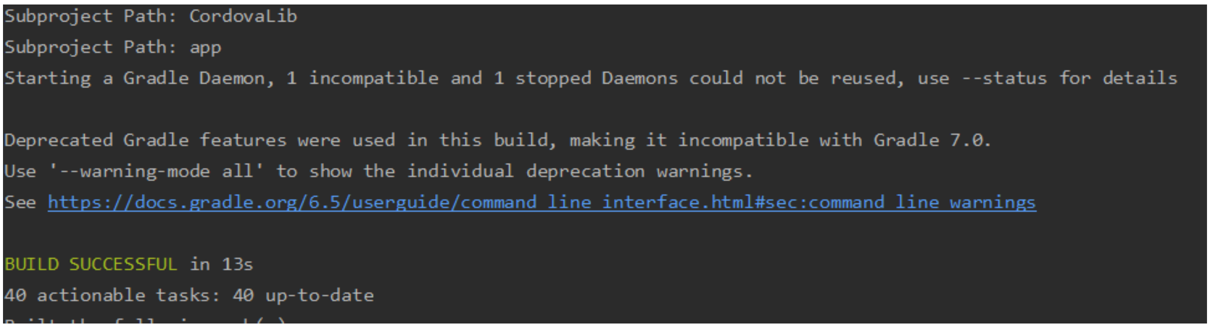
-Command Line (Step 2)



```
>ionic cordova build android
> ng.cmd run app:ionic-cordova-build --platform=android
Generating ES5 bundles for differential loading...
ES5 bundle generation complete.

chunk {polyfills} polyfills-es2015.js, polyfills-es2015.js.map (polyfills) 268 kB [initial] [rendered]
chunk {polyfills-es5} polyfills-es5.js, polyfills-es5.js.map (polyfills-es5) 735 kB [initial] [rendered]
chunk {0} 0-es2015.js, 0-es2015.js.map () 31.2 kB  [rendered]
chunk {0} 0-es5.js, 0-es5.js.map () 37.8 kB  [rendered]
chunk {8} 8-es2015.js, 8-es2015.js.map () 11.4 kB  [rendered]
chunk {8} 8-es5.js, 8-es5.js.map () 14.2 kB  [rendered]
chunk {2} 2-es2015.js, 2-es2015.js.map () 67.1 kB  [rendered]
chunk {2} 2-es5.js, 2-es5.js.map () 92.8 kB  [rendered]
chunk {4} 4-es2015.js, 4-es2015.js.map () 16.3 kB  [rendered]
chunk {4} 4-es5.js, 4-es5.js.map () 20.6 kB  [rendered]
chunk {3} 3-es2015.js, 3-es2015.js.map () 6.16 kB  [rendered]
chunk {3} 3-es5.js, 3-es5.js.map () 8.09 kB  [rendered]
chunk {7} 7-es2015.js, 7-es2015.js.map () 16.6 kB  [rendered]
chunk {7} 7-es5.js, 7-es5.js.map () 19.7 kB  [rendered]
chunk {1} 1-es2015.js, 1-es2015.js.map () 47.7 kB  [rendered]
chunk {1} 1-es5.js, 1-es5.js.map () 56.8 kB  [rendered]
```

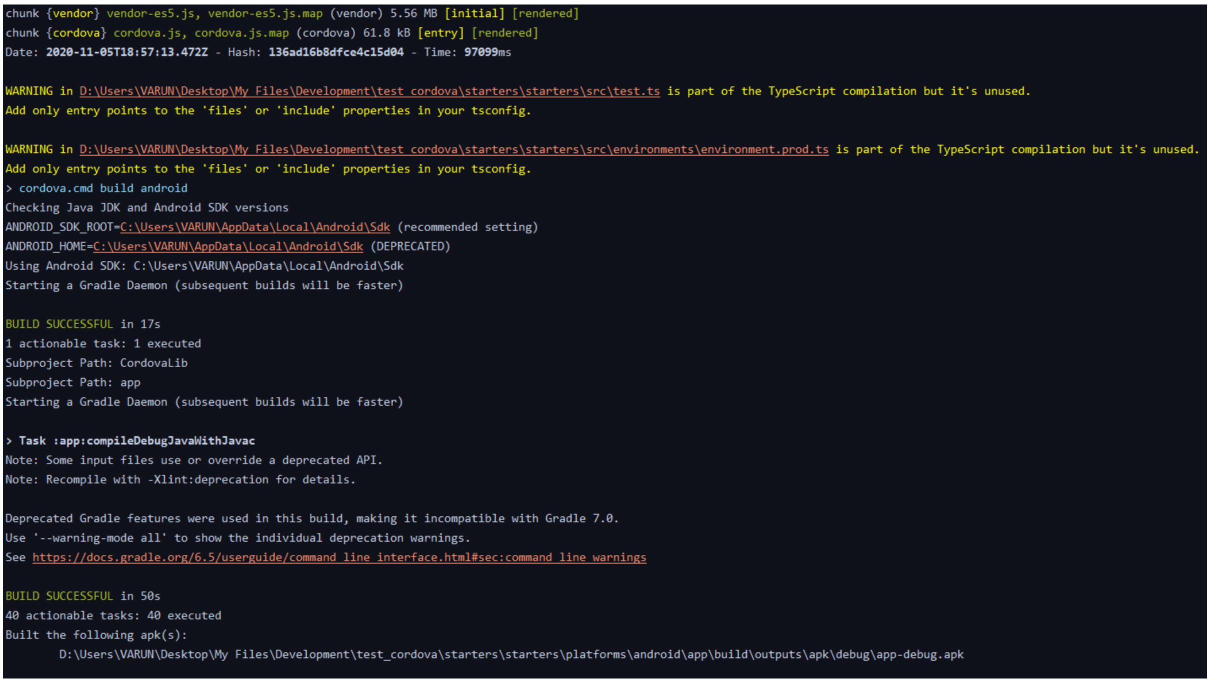


```
> cordova.cmd build android
Checking Java JDK and Android SDK versions
ANDROID_SDK_ROOT=undefined (recommended setting)
ANDROID_HOME=undefined (DEPRECATED)
```



```
Subproject Path: CordovaLib
Subproject Path: app
Starting a Gradle Daemon, 1 incompatible and 1 stopped Daemons could not be reused, use --status for details

Deprecated Gradle features were used in this build, making it incompatible with Gradle 7.0.
Use '--warning-mode all' to show the individual deprecation warnings.
See https://docs.gradle.org/6.5/userguide/command line interface.html#sec:command line warnings

BUILD SUCCESSFUL in 13s
40 actionable tasks: 40 up-to-date
```

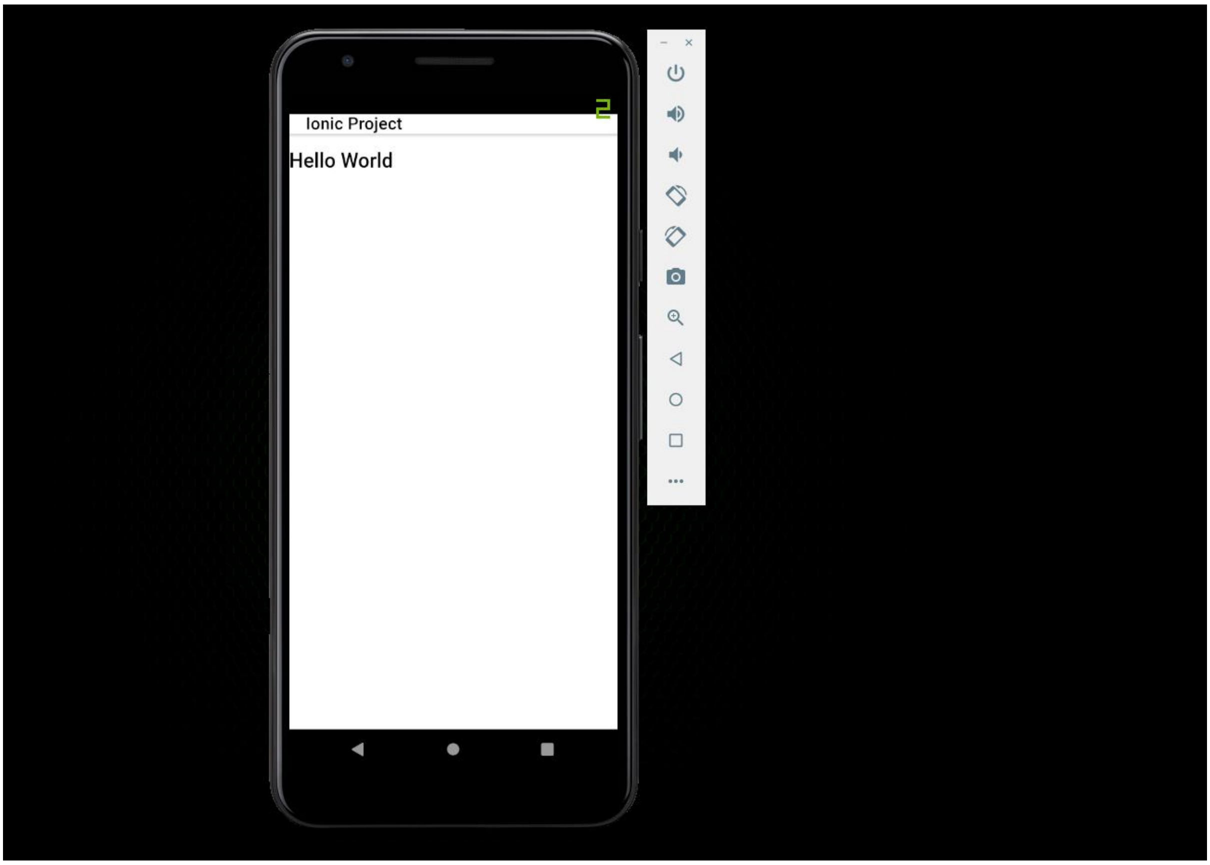
-Command Line (Step 3)



```
chunk {vendor} vendor-es5.js, vendor-es5.js.map (vendor) 5.56 MB [initial] [rendered]
chunk {cordova} cordova.js, cordova.js.map (cordova) 61.8 kB [entry] [rendered]
Date: 2020-11-05T18:57:13.472Z - Hash: 136ad16b8dfce4c15d04 - Time: 97099ms

WARNING in D:\Users\VARUN\Desktop\My Files\Development\test cordova\starters\starters\src\test.ts is part of the TypeScript compilation but it's unused.
Add only entry points to the 'files' or 'include' properties in your tsconfig.

WARNING in D:\Users\VARUN\Desktop\My Files\Development\test cordova\starters\starters\src\environments\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.
> cordova.cmd build android
Checking Java JDK and Android SDK versions
ANDROID_SDK_ROOT=C:\Users\VARUN\AppData\Local\Android\Sdk (recommended setting)
ANDROID_HOME=C:\Users\VARUN\AppData\Local\Android\Sdk (DEPRECATED)
Using Android SDK: C:\Users\VARUN\AppData\Local\Android\Sdk
Starting a Gradle Daemon (subsequent builds will be faster)

BUILD SUCCESSFUL in 17s
1 actionable task: 1 executed
Subproject Path: CordovaLib
Subproject Path: app
Starting a Gradle Daemon (subsequent builds will be faster)

> Task :app:compileDebugJavaWithJavac
Note: Some input files use or override a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

Deprecated Gradle features were used in this build, making it incompatible with Gradle 7.0.
Use '--warning-mode all' to show the individual deprecation warnings.
See https://docs.gradle.org/6.5/userguide/command line interface.html#sec:command line warnings

BUILD SUCCESSFUL in 50s
40 actionable tasks: 40 executed
Built the following apk(s):
        D:\Users\VARUN\Desktop\My Files\Development\test_cordova\starters\starters\platforms\android\app\build\outputs\apk\debug\app-debug.apk
```

-

Android App (After Step 4)



Ionic Project

Hello World

Practical 7 : Ionic Create, Generate and Add Pages

What are Ionic Pages?

An Ionic page is just an Angular component.

The Ionic Page handles registering and displaying specific pages based on URLs. It's used underneath NavController so it will never have to be interacted with directly. When a new page is pushed with NavController, the URL is updated to match the path to this page.

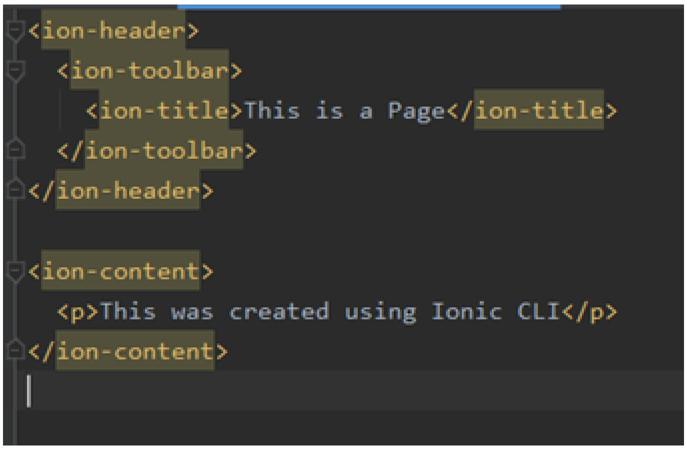
Unlike traditional web apps, URLs don't dictate navigation in Ionic apps. Instead, URLs help us link to specific pieces of content as a breadcrumb. The current URL gets updated as we navigate, but we use the NavController push and pop, or NavPush and NavPop to move around. This makes it much easier to handle complicated nested navigation.

The `ionic generate` or `ionic g` command uses the Angular CLI to generate features such as pages, components, directives, services, etc.

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> blank`
5. Then it will ask to choose a framework so choose `Angular JS``
6. Navigate to the folder by running `cd <app_name>`
7. To generate and add a page run `ionic g page <page_name>`
8. This will create a folder with all the components of your page in `{project_root}\src\app\{page_name}`
9. Then to start running the ionic web page on the server type `ionic serve`
10. To access the web page go on http://localhost:8100/{page_name}

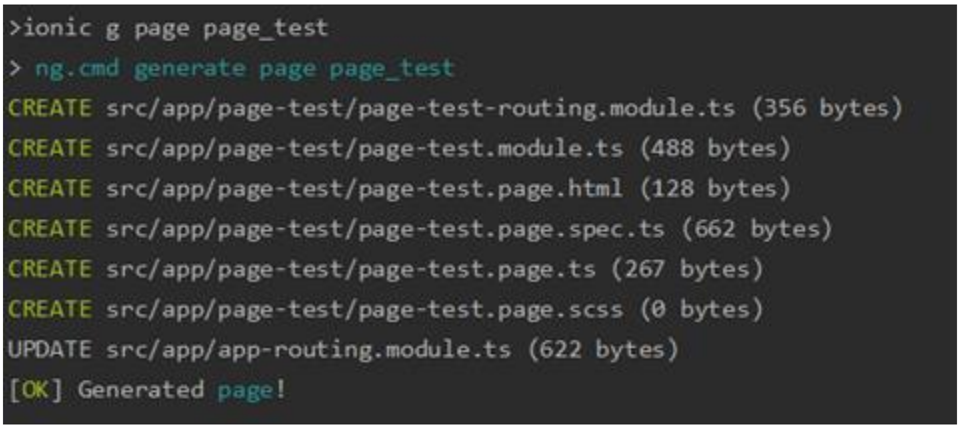
Code:



```
<ion-header>
  <ion-toolbar>
    <ion-title>This is a Page</ion-title>
  </ion-toolbar>
</ion-header>

<ion-content>
  <p>This was created using Ionic CLI</p>
</ion-content>
```

Output;

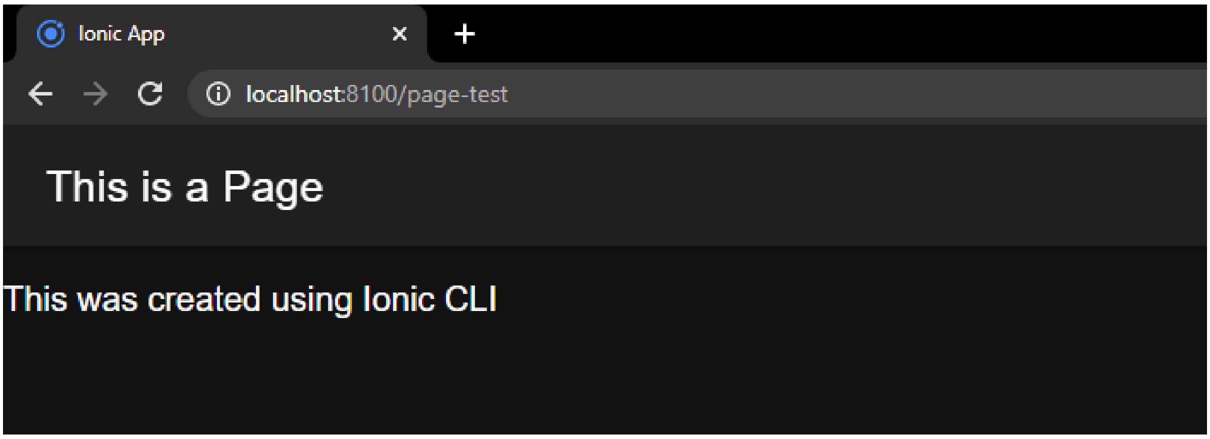
-Command Line (Step 7)



```
>ionic g page page_test
> ng.cmd generate page page_test
CREATE src/app/page-test/page-test-routing.module.ts (356 bytes)
CREATE src/app/page-test/page-test.module.ts (488 bytes)
CREATE src/app/page-test/page-test.page.html (128 bytes)
CREATE src/app/page-test/page-test.page.spec.ts (662 bytes)
CREATE src/app/page-test/page-test.page.ts (267 bytes)
CREATE src/app/page-test/page-test.page.scss (0 bytes)
UPDATE src/app/app-routing.module.ts (622 bytes)
[OK] Generated page!
```

-

Browser (Step 10)



This is a Page

This was created using Ionic CLI

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 wil be using 'tabs' in the practical

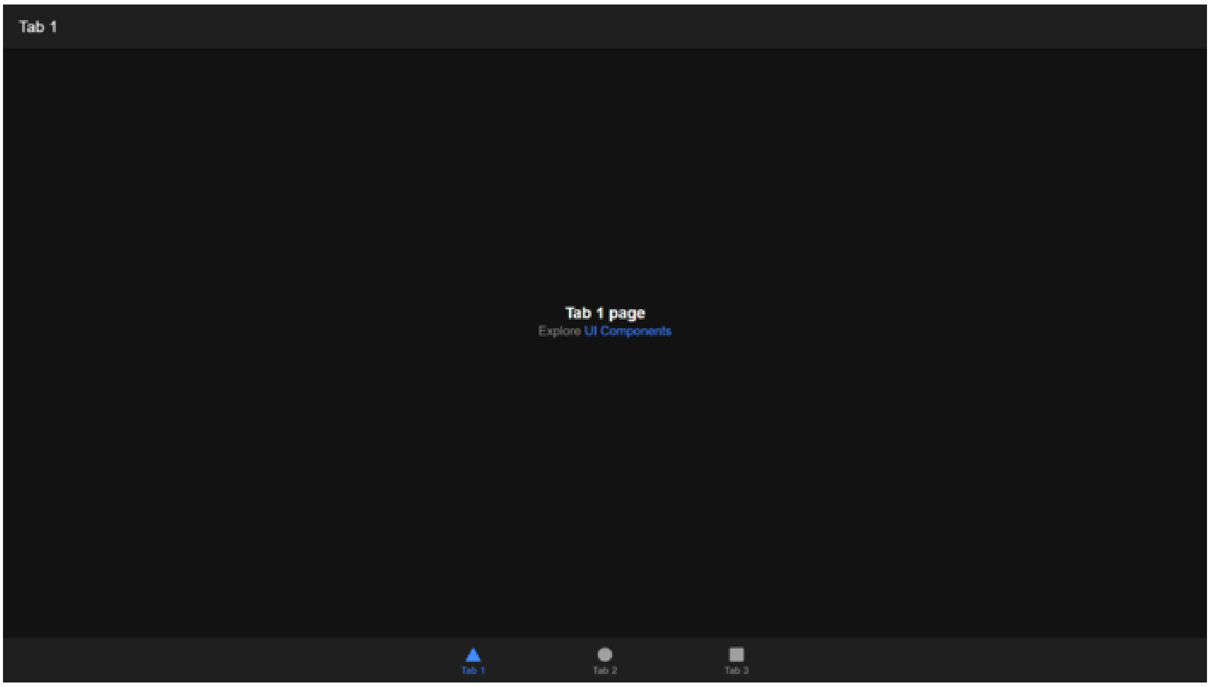
Steps:

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

Output:

-Browser (Step 8)



Tab 1

Tab 1 page

Explore UI Components