

Tutorial 7

Ionic Framework

March 2, 2017

CS 5551 ADVANCED SOFTWARE ENGINEERING

UMKC

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What is Ionic ?

“Ionic is the beautiful, open source front-end SDK for developing hybrid mobile apps with web technologies.”

-- ionicframework.com

Angular JS is the heart of Ionic SDK.

All the logic is written using Angular JS and Ionic acts as a bridge between the native application and web development.

Can develop applications for Android and iOS.

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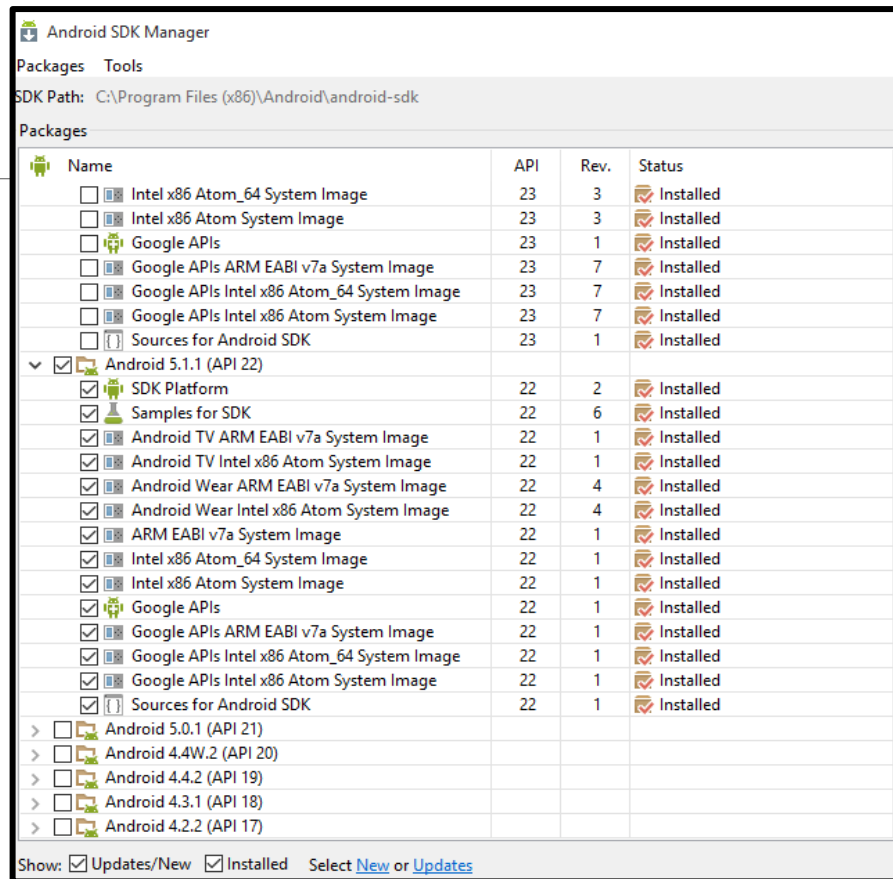
Setup

- ❑ Step 1: Install Android SDK
- ❑ Step 2: Install Angular JS & Ionic extensions in Adobe brackets
- ❑ Step 3: Install Visual studio code
- ❑ Step 4: Install node js
- ❑ Step 5: Install ionic command line tools
- ❑ More Info : <http://ionicframework.com/docs/guide/installation.html>

Install Android SDK

<https://developer.android.com/sdk/installing/index.html?pkg=tools>

- 1) Install Android 5.1.1 using SDK manager.
- 2) Open AVD Manager and create a virtual device. Please choose Android 5.1.1 version for the device.



AVD Manager

- There are different settings for creating a virtual device, just like when you shop for a new Android mobile.
- Please choose target \leq Android 5.1.1 version
- CPU - arm

Edit Android Virtual Device (AVD)

AVD Name: sample

Device: Nexus 6 (5.96", 1440 x 2560: 560dpi)

Target: Android 5.1.1 - API Level 22

CPU/ABI: ARM (armeabi-v7a)

Keyboard: ☒ Hardware keyboard present

Skin: No skin

Front Camera: None

Back Camera: None

Memory Options: RAM: 3072 VM Heap: 32

Internal Storage: 200 MiB

SD Card:

☒ Size: MiB

☐ File: Browse...

Emulation Options: ☐ Snapshot ☐ Use Host GPU

OK Cancel

Code Editors

Brackets

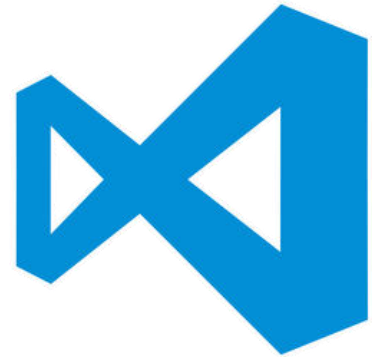
Better HTML editing in Brackets Code.



VS

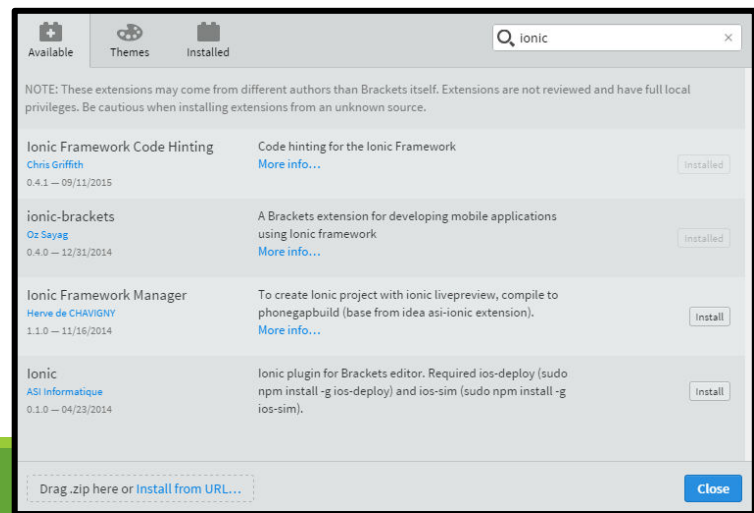
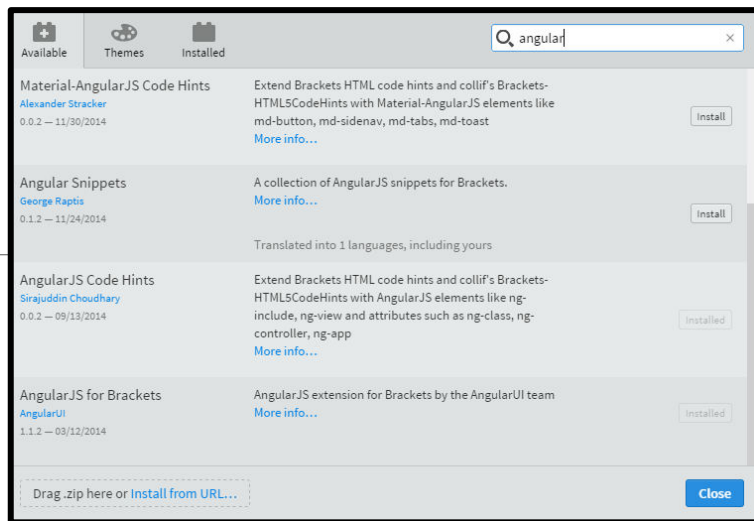
Visual Studio Code

Better JS code hints in Visual Studio



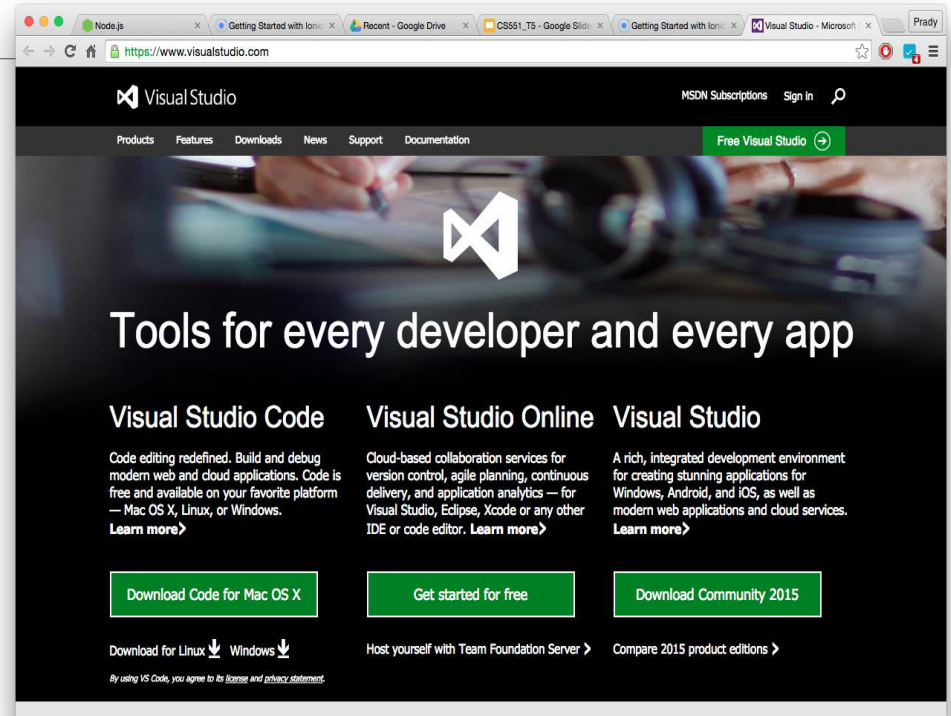
Brackets

- Install the following extensions in adobe brackets for a better developer experience:
- AngularJS Code Hints
- Angular JS for Brackets
- ionic-brackets
- ionic Framework Code Hinting
- Simple JS Code Hints



Visual Studio Code

- <https://www.visualstudio.com/>
- Download “Visual Studio Code”

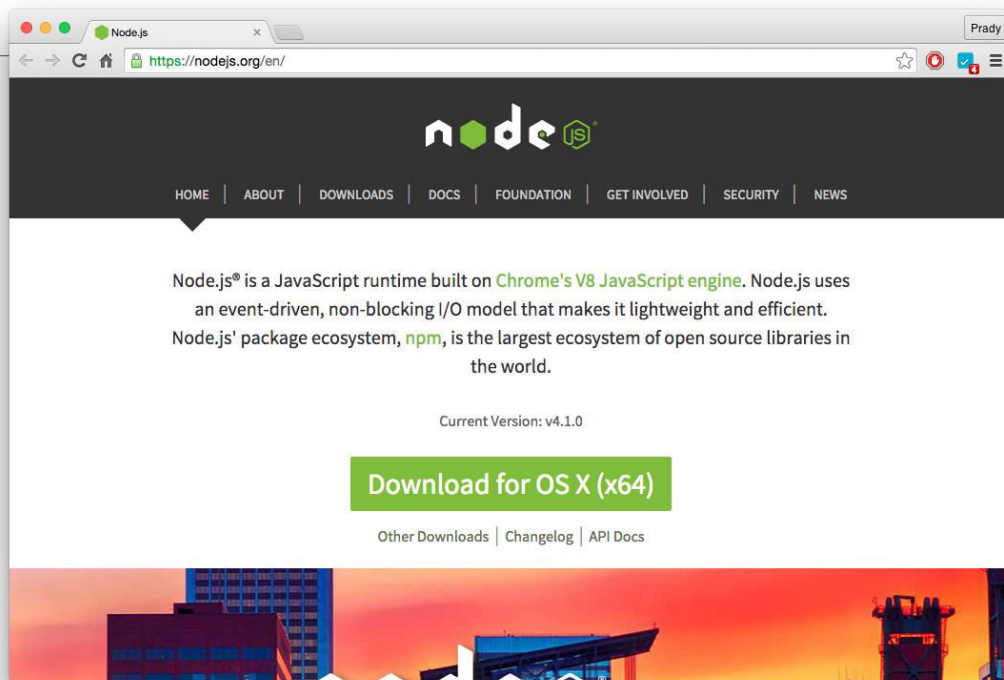


npm(node package manager)

- Default package manager for the JavaScript runtime environment Node.js.
- Installed automatically with the environment.
- npm is written entirely in JavaScript
- It installs the packages you want to use and provides a useful interface to work with them.
- Online repository for the publishing of open-source Node.js projects.
- Command line utility to install Node.js packages
- <https://docs.npmjs.com/getting-started/what-is-npm>

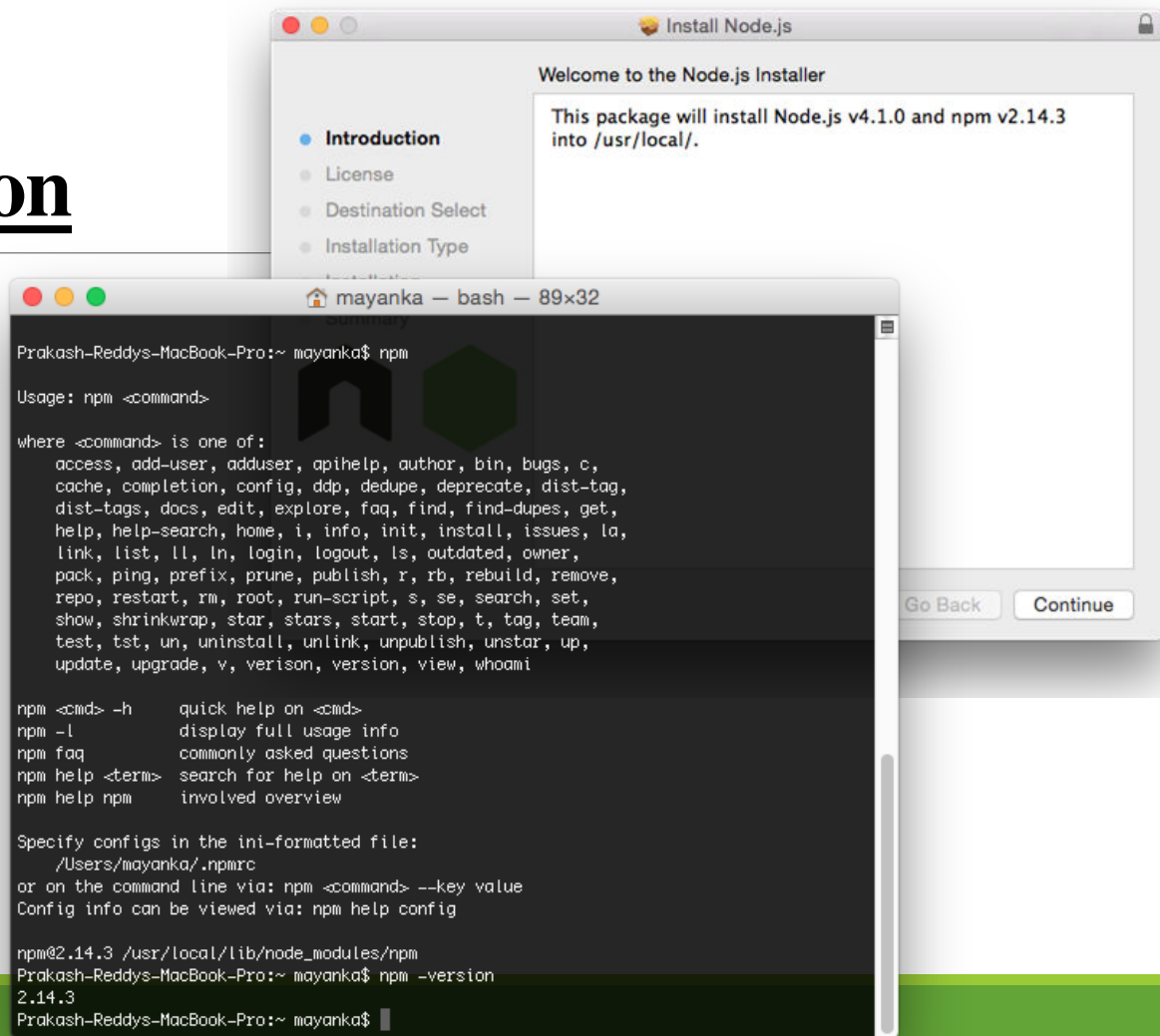
node js installation

- Download the system specific build.
- <https://nodejs.org/en/>



node.js Verification

Open terminal/command prompt and type “npm” or “npm -v” to check the installation.



Install Ionic

Command

npm install -g cordova ionic

All unix based OS users,
don't forget to use the
mighty “sudo”

mayanka — bash — 158x56

```
Prakash-Reddys-MacBook-Pro:~ mayanka$ npm install -g cordova ionic
npm ERR! tar.unpack: untar: error: /Users/mayanka/.npm/ionic/1.6.4/package.tgz
npm ERR! tar.unpack: untar: error: /Users/mayanka/.npm/cordova/5.3.1/package.tgz
npm ERR! Darwin 14.5.0
npm ERR! argv "/usr/local/bin/node" "/usr/local/bin/npm" "install" "-g" "cordova" "ionic"
npm ERR! node v4.1.0
npm ERR! npm v2.14.3
npm ERR! path /usr/local/lib/node_modules/ionic
npm ERR! code EACCES
npm ERR! errno -13
npm ERR! syscall mkdir
```

```
npm ERR! Error: EACCES: permission denied, mkdir '/usr/local/lib/node_modules/ionic'
npm ERR!   at Error (native)
npm ERR!   { [Error: EACCES: permission denied, mkdir '/usr/local/lib/node_modules/ionic']
npm ERR!     errno: -13,
npm ERR!     code: 'EACCES',
npm ERR!     syscall: 'mkdir',
npm ERR!     path: '/usr/local/lib/node_modules/ionic',
npm ERR!     fstream_type: 'Directory',
npm ERR!     fstream_path: '/usr/local/lib/node_modules/ionic',
npm ERR!     fstream_class: 'DirWriter',
npm ERR!     fstream_stack:
npm ERR!       [ '/usr/local/lib/node_modules/npm/node_modules/fstream/lib/dir-writer.js:35:25',
npm ERR!         '/usr/local/lib/node_modules/npm/node_modules/mkdirp/index.js:47:53',
npm ERR!         'FSReqWrap.oncomplete (fs.js:82:15)' ] }
npm ERR! Please try running this command again as root/Administrator.
```

npm ERR! Please include the following file with any support request:

npm ERR! /Users/mayanka/.npm-debug.log

```
Prakash-Reddys-MacBook-Pro:~ mayanka$ sudo npm install -g cordova ionic
```

WARNING: Improper use of the sudo command could lead to data loss
or the deletion of important system files. Please double-check your
typing when using sudo. Type "man sudo" for more information.

To proceed, enter your password, or type Ctrl-C to abort.

Password:

```
npm WARN engine x@builder@2.2.1: wanted: {"node": ">=0.8.x" || 0.10.x"} (current: {"node": "4.1.0", "npm": "2.14.3"})
npm WARN engine cordova-js@4.0.0: wanted: {"node": ">=0.8.x"} (current: {"node": "4.1.0", "npm": "2.14.3"})
npm WARN engine npm@1.3.4: wanted: {"node": ">=0.6", "npm": "1"} (current: {"node": "4.1.0", "npm": "2.14.3"})
npm WARN engine x@builder@2.2.1: wanted: {"node": ">=0.8.x" || 0.10.x"} (current: {"node": "4.1.0", "npm": "2.14.3"})
/usr/local/bin/cordova -> /usr/local/lib/node_modules/cordova/bin/cordova
npm WARN install:many normalize-package-data was bundled with npm@1.3.4, but bundled package wasn't found in unpacked tree
/usr/local/bin/ionic -> /usr/local/lib/node_modules/ionic/bin/ionic
cordova@5.3.1 /usr/local/lib/node_modules/cordova
├─ underscore@1.7.0
├─ q@1.0.1
├─ npt@3.0.1 (abbrev@1.0.7)
├─ cordova-lib@5.3.1 (valid-identifier@0.0.1, unorm@1.3.3, osenv@0.1.0, properties-parser@0.2.3, bplist-parser@0.0.6, semver@4.3.6, dep-graph@1.1.0, shelljs@0.3.0, rc@0.5.2, xcode@0.8.0, elementtree@0.1.6, glob@4.0.6, npmconf@2.1.2, request@2.47.0, cordova-serve@0.1.3, init-package-json@1.9.1, tar@1.0.2, aliasify@1.7.2, cordova-registry-mapper@1.1.1, cordova-app-hello-world@3.9.0, plist@1.1.0, npm@2.14.5, cordova-js@4.1.1)
```

Ionic verification

- There are different options for the command “ionic”
- There are different types of app templates available . (next slide)

Prakash-Reddys-MacBook-Pro:~ mayank\$ ionic



Usage: ionic task args

=====

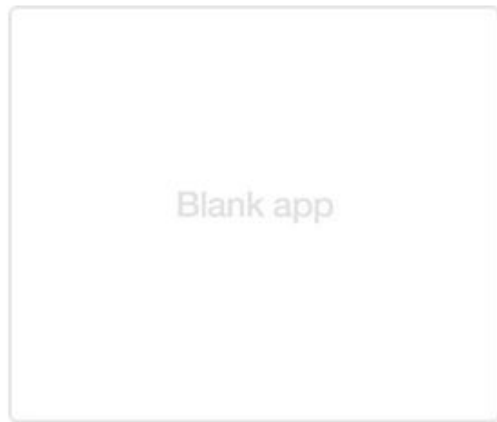
Available tasks: (use --help or -h for more info)

```
start ..... Starts a new Ionic project in the specified PATH
serve ..... Start a local development server for app dev/testing
platform ..... Add platform target for building an Ionic app
run ..... Run an Ionic project on a connected device
emulate ..... Emulate an Ionic project on a simulator or emulator
build ..... Locally build an Ionic project for a given platform
plugin ..... Add a Cordova plugin
resources ..... Automatically create icon and splash screen resources (beta)
                  Put your images in the ./resources directory, named splash or icon.
                  Accepted file types are .png, .ai, and .psd.
                  Icons should be 192x192 px without rounded corners.
                  Splashscreens should be 228x228 px, with the image centered in the middle.

upload ..... Upload an app to your Ionic account
share ..... Share an app with a client, co-worker, friend, or customer
lib ..... Gets Ionic library version or updates the Ionic library
setup ..... Configure the project with a build tool (beta)
io ..... Integrate your app with the ionic.io platform services (alpha)
push ..... Upload APNS and GCM credentials to Ionic Push (alpha)
config ..... Set configuration variables for your ionic app (alpha)
browser ..... Add another browser for a platform (beta)
service ..... Add an Ionic service package and install any required plugins
add ..... Add an Ion, bower component, or addon to the project
remove ..... Remove an Ion, bower component, or addon from the project
list ..... List Ions, bower components, or addons in the project
ions ..... List available ions to add to your project
templates ..... List available Ionic starter templates
info ..... List information about the users runtime environment
help ..... Provides help for a certain command
link ..... Sets your Ionic App ID for your project
hooks ..... Manage your Ionic Cordova hooks
state ..... Saves or restores state of your Ionic Application using the package.json file
docs ..... Opens up the documentation for Ionic
```

Prakash-Reddys-MacBook-Pro:~ mayank\$

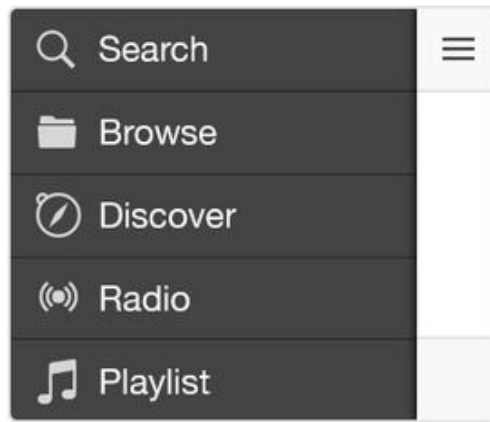
Ionic App types



```
$ ionic start myApp blank
```



```
$ ionic start myApp tabs
```



```
$ ionic start myApp sidemenu
```

Ionic App Creation

To create an app

ionic start myApp tabs

App name (a folder shall be created using this)

Template type

There are different types of app templates available .
(next slide)

```
Prakash-Reddys-MacBook-Pro:ionicapps mayanka$ ionic start myApp tabs
Creating Ionic app in folder /Users/mayanka/Documents/ionicapps/myApp based on tabs project
Downloading: https://github.com/driftyco/ionic-app-base/archive/master.zip
[=====] 100% 0.0s
Downloading: https://github.com/driftyco/ionic-starter-tabs/archive/master.zip
[=====] 100% 0.0s
Updated the hooks directory to have execute permissions
Update Config.xml
Initializing cordova project
Adding in iOS application by default
npm http GET https://registry.npmjs.org/cordova-ios
npm http 200 https://registry.npmjs.org/cordova-ios
npm http GET https://registry.npmjs.org/cordova-ios
npm http 200 https://registry.npmjs.org/cordova-ios
npm http GET https://registry.npmjs.org/cordova-ios/-/cordova-ios-3.8.0.tgz
npm http 200 https://registry.npmjs.org/cordova-ios/-/cordova-ios-3.8.0.tgz

Your Ionic project is ready to go! Some quick tips:

* cd into your project: $ cd myApp

* Setup this project to use Sass: ionic setup sass

* Develop in the browser with live reload: ionic serve

* Add a platform (ios or Android): ionic platform add ios [android]
  Note: iOS development requires OS X currently
  See the Android Platform Guide for full Android installation instructions:
  https://cordova.apache.org/docs/en/edge/guide_platforms_android_index.md.html

* Build your app: ionic build -<PLATFORM>

* Simulate your app: ionic emulate -<PLATFORM>

* Run your app on a device: ionic run -<PLATFORM>

* Package an app using Ionic package service: ionic package -<MODE> -<PLATFORM>

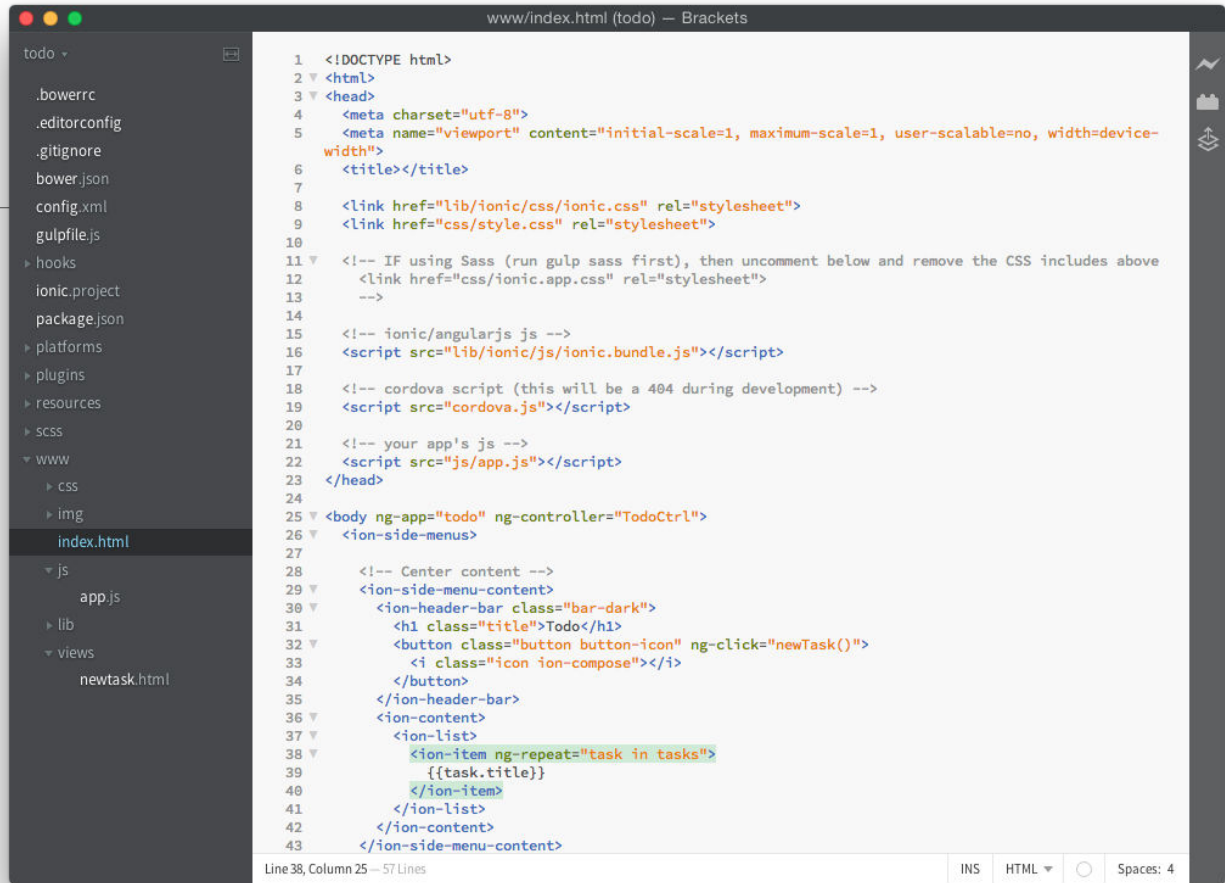
For more help use ionic --help or ionic docs

Visit the Ionic docs: http://ionicframework.com/docs

Create an ionic.io account to send Push Notifications and use the Ionic View app?
(Y/n): n
+-----+
+ New Ionic Updates for September 2015
+
+ The View App just landed. Preview your apps on any device
+ http://view.ionic.io
+
+ Invite anyone to preview and test your app
+ ionic share EMAIL
+
+ Generate splash screens and icons with ionic resource
+ http://ionicframework.com/blog/automating-icons-and-splash-screens/
+
```

Open the App created in Adobe Brackets

- All the development work shall be done using this editor.
- Before writing any code, let us run the application which we've created for the first time.



```
www/index.html (todo) — Brackets
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <meta charset="utf-8">
5   <meta name="viewport" content="initial-scale=1, maximum-scale=1, user-scalable=no, width=device-
width">
6   <title></title>
7
8   <link href="lib/ionic/css/ionic.css" rel="stylesheet">
9   <link href="css/style.css" rel="stylesheet">
10
11 <!-- IF using Sass (run gulp sass first), then uncomment below and remove the CSS includes above
12   <link href="css/ionic.app.css" rel="stylesheet">
13   -->
14
15 <!-- ionic/angularjs js -->
16 <script src="lib/ionic/js/ionic.bundle.js"></script>
17
18 <!-- cordova script (this will be a 404 during development) -->
19 <script src="cordova.js"></script>
20
21 <!-- your app's js -->
22 <script src="js/app.js"></script>
23 </head>
24
25 <body ng-app="todo" ng-controller="TodoCtrl">
26   <ion-side-menus>
27
28     <!-- Center content -->
29     <ion-side-menu-content>
30       <ion-header-bar class="bar-dark">
31         <h1 class="title">Todo</h1>
32         <button class="button button-icon" ng-click="newTask()">
33           <i class="icon ion-compose"></i>
34         </button>
35       </ion-header-bar>
36       <ion-content>
37         <ion-list>
38           <ion-item ng-repeat="task in tasks">
39             {{task.title}}
40           </ion-item>
41         </ion-list>
42       </ion-content>
43     </ion-side-menu-content>
```

Line 38, Column 25 — 57 Lines INS HTML Spaces: 4

First Sample Run

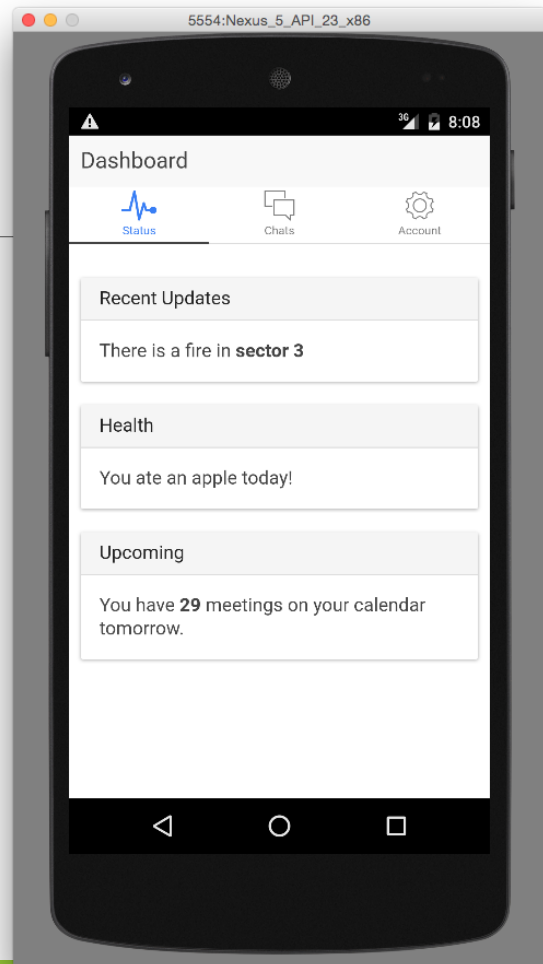
```
$ cd myApp
```

```
$ ionic platform add android
```

```
$ ionic build android
```

```
$ ionic emulate android
```

A sample application running with “tabs”
template.



“To Do” Application

ionic start todo blank

Note: This time we are going to take a blank template unlike the first sample app.

To do application is used to show a list of to do items.

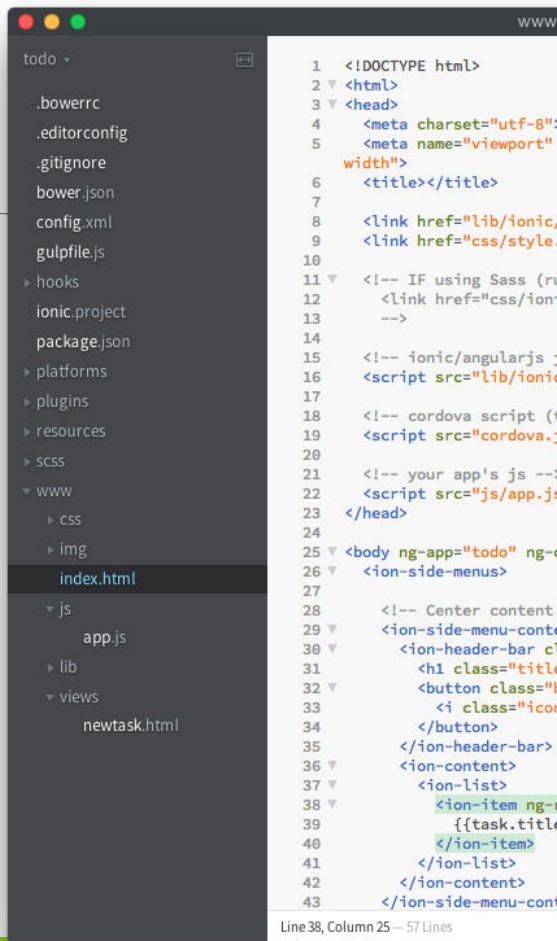


Folder Structure

- platforms - contains your iOS and Android projects
- hooks - for custom actions to be taken as your app moves through the Cordova development process
- plugins - Cordova stores the plugins that you add to your project. Plugins are added by the command:

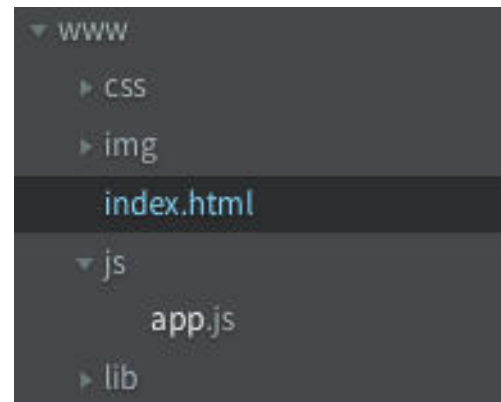
ionic plugin add {plugin}

- www - is where your app is developed



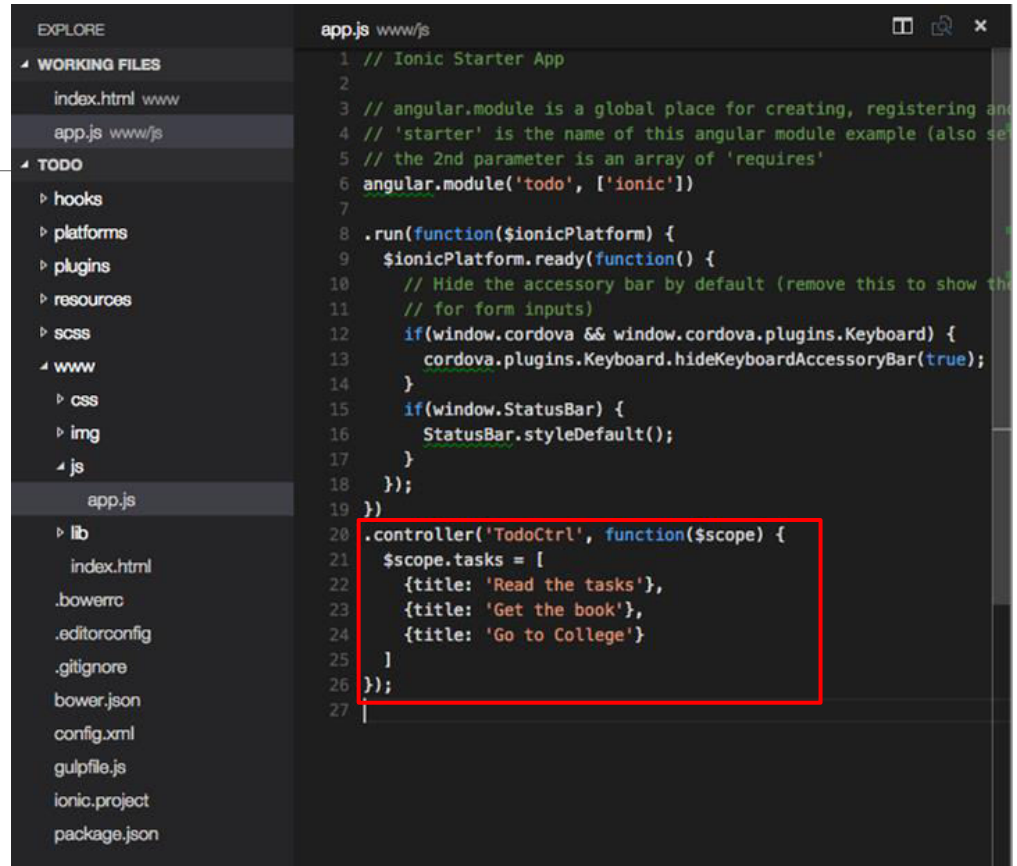
www structure

- **css** - project specific css files
- **img** - all the images
- **js** - js files to be used in project
- **lib** - libraries like angular js are stored here



Controller Creation

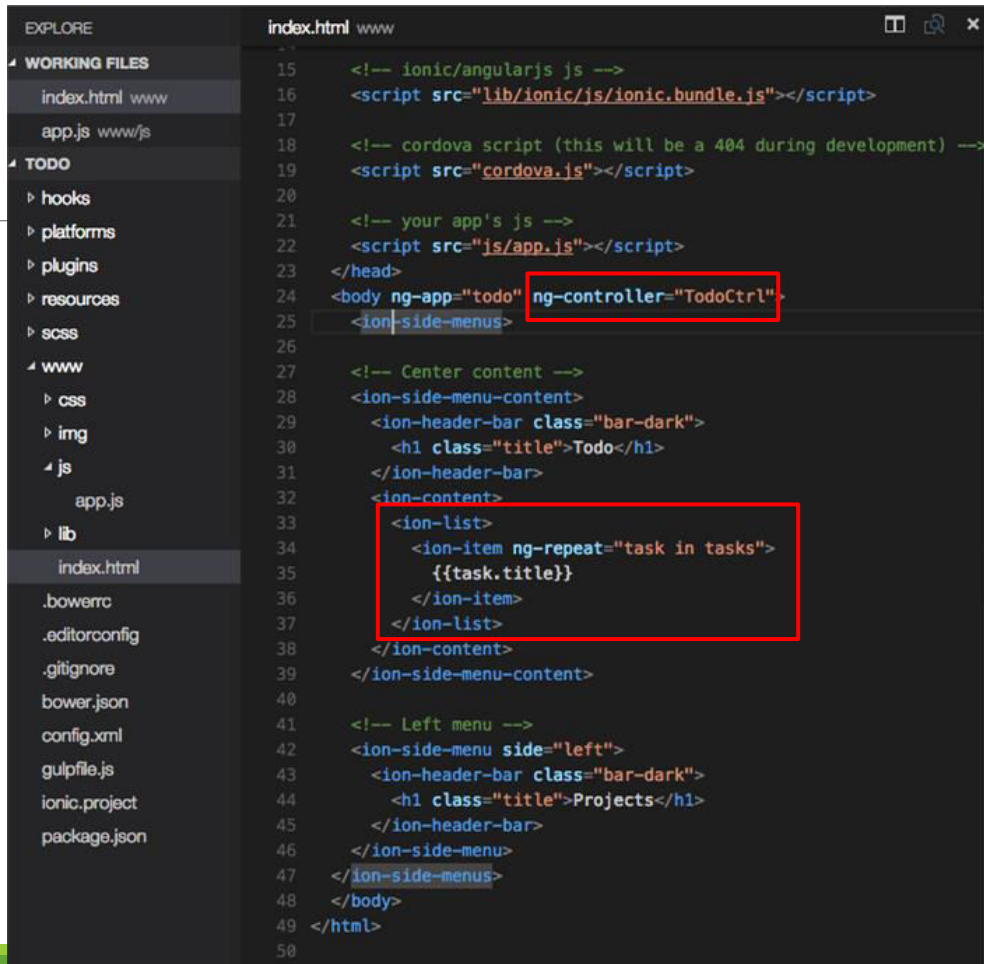
- ***TodoCtrl*** is a controller which shows the tasks.
- ***tasks*** is the variable which is initiated with a temporary tasks.
- ***\$scope*** is the variable provided by angular js framework.



```
app.js www/js
1 // Ionic Starter App
2
3 // angular.module is a global place for creating, registering and
4 // 'starter' is the name of this angular module example (also set
5 // the 2nd parameter is an array of 'requires'
6 angular.module('todo', ['ionic'])
7
8 .run(function($ionicPlatform) {
9   $ionicPlatform.ready(function() {
10     // Hide the accessory bar by default (remove this to show the
11     // for form inputs)
12     if(window.cordova && window.cordova.plugins.Keyboard) {
13       cordova.plugins.Keyboard.hideKeyboardAccessoryBar(true);
14     }
15     if(window.StatusBar) {
16       StatusBar.styleDefault();
17     }
18   });
19 })
20 .controller('TodoCtrl', function($scope) {
21   $scope.tasks = [
22     {title: 'Read the tasks'},
23     {title: 'Get the book'},
24     {title: 'Go to College'}
25   ]
26 });
27
```

Include View for Showing Tasks

- index.html has all the views to be shown
- *ion-list* is a list
- *ion-item* is a tag to show single item in ion-list.
- *ng-repeat* is similar to for loop in front-end
- To show a variable use “`{{var_name}}`”
- Types of components in Ionic
<http://ionicframework.com/docs/components/>



```
15 <!-- ionic/angularjs js -->
16 <script src="lib/ionic/js/ionic.bundle.js"></script>
17
18 <!-- cordova script (this will be a 404 during development) -->
19 <script src="cordova.js"></script>
20
21 <!-- your app's js -->
22 <script src="js/app.js"></script>
23 </head>
24 <body ng-app="todo" ng-controller="TodoCtrl">
25   <ion-side-menus>
26
27     <!-- Center content -->
28     <ion-side-menu-content>
29       <ion-header-bar class="bar-dark">
30         <h1 class="title">Todo</h1>
31       </ion-header-bar>
32       <ion-content>
33         <ion-list>
34           <ion-item ng-repeat="task in tasks">
35             {{task.title}}
36           </ion-item>
37         </ion-list>
38       </ion-content>
39     </ion-side-menu-content>
40
41     <!-- Left menu -->
42     <ion-side-menu side="left">
43       <ion-header-bar class="bar-dark">
44         <h1 class="title">Projects</h1>
45       </ion-header-bar>
46     </ion-side-menu>
47   </ion-side-menus>
48 </body>
49 </html>
50
```

Testing your App

■ On Browser :

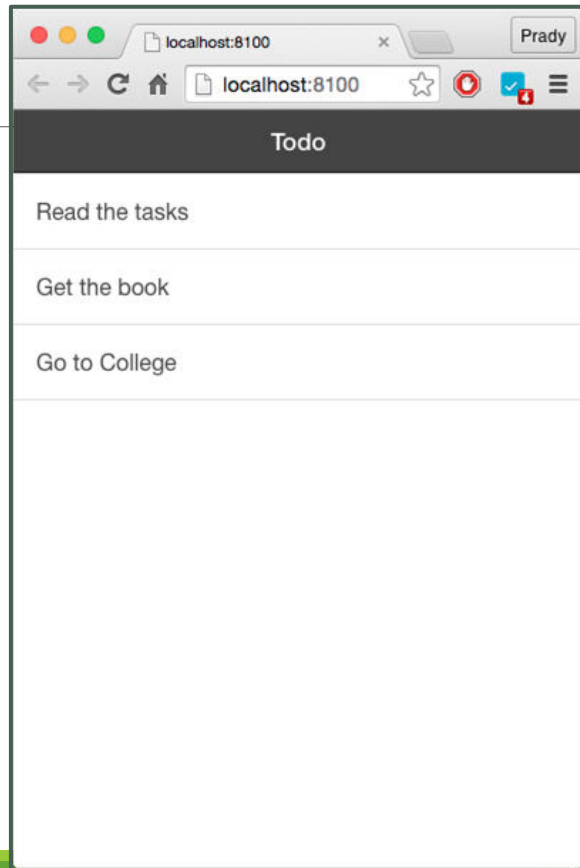
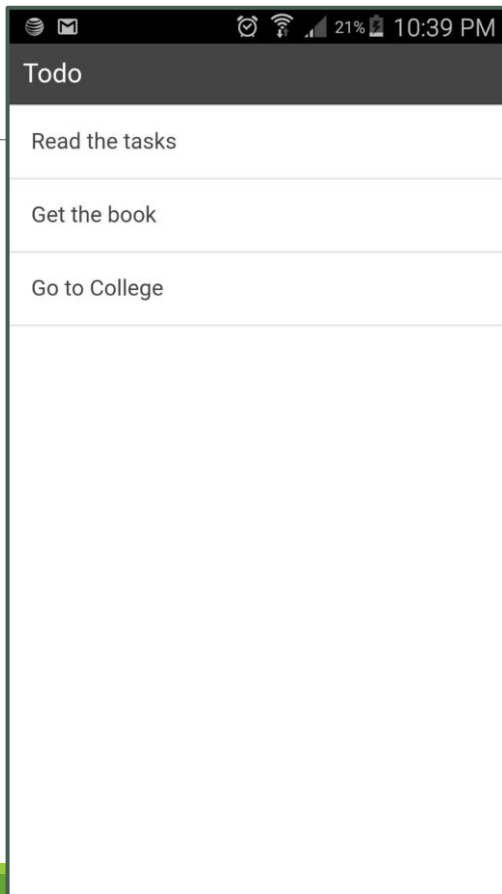
ionic serve

- No need to have a device to test minor changes.

■ On Device :

- Connect your device to the development machine and enable debugging option on your Android device and execute the following command

ionic run



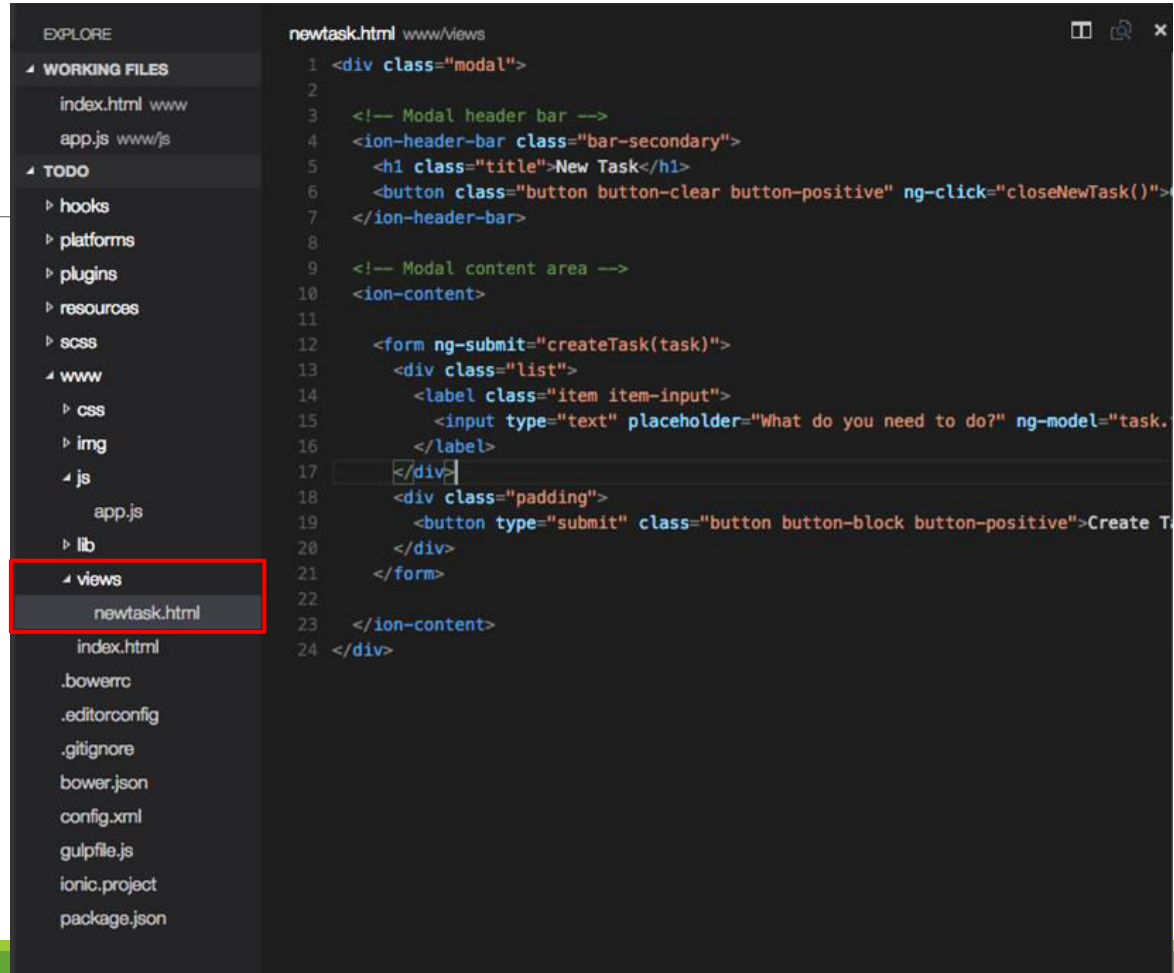
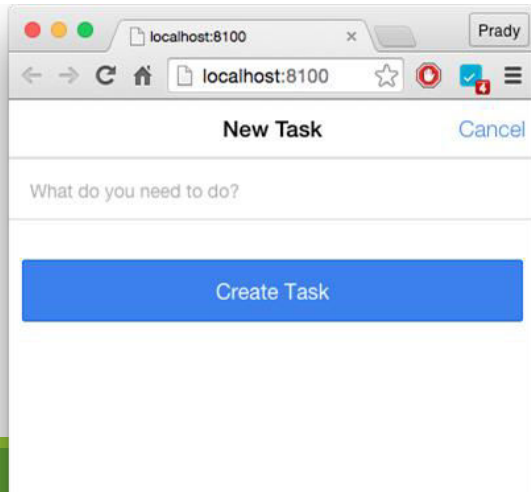
Task creation

- Add a button on top of the header which calls create task function.
- This is a general button with an icon.

```
<!-- Center content -->
<ion-side-menu-content>
  <ion-header-bar class="bar-dark">
    <h1 class="title">Todo</h1>
    <button class="button button-icon" ng-click="newTask()">
      <i class="icon ion-compose"></i>
    </button>
  </ion-header-bar>
  <ion-content>
    <ion-list>
      <ion-item ng-repeat="task in tasks">
        {{task.title}}
      </ion-item>
    </ion-list>
  </ion-content>
</ion-side-menu-content>
```


New Task Modal

- Create a folder named “views” in www.
- This should be the place to create all the views.



Task Creation Logic

modal controller object creation.

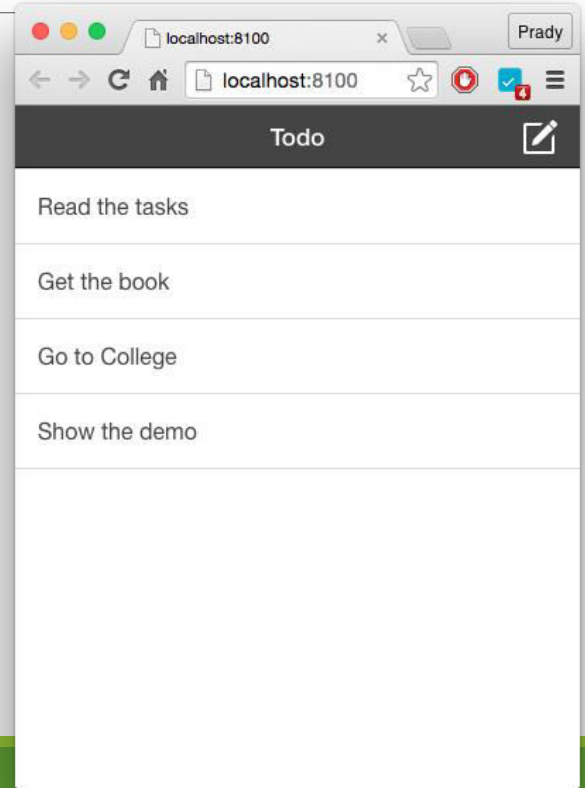
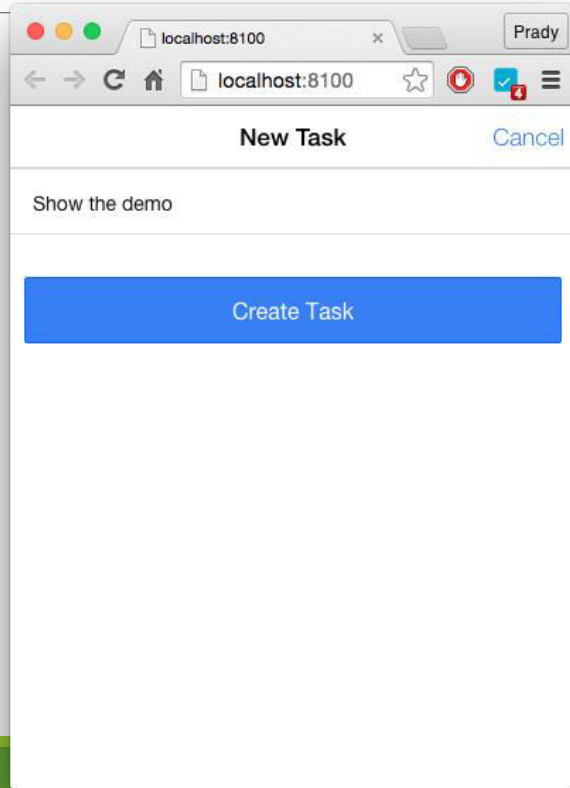
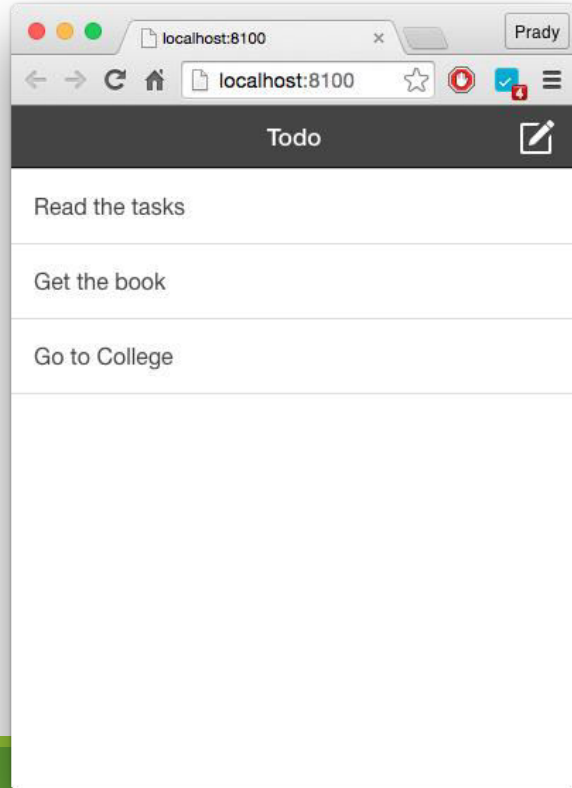
pushing the task into the **tasks** variable

Shows modal to create task

Closes modal

```
20 .controller('TodoCtrl', function ($scope, $ionicModal) {
21   $scope.tasks = [
22     { title: 'Read the tasks' },
23     { title: 'Get the book' },
24     { title: 'Go to College' }
25   ];
26
27   // Create and load the Modal
28   $ionicModal.fromTemplateUrl('views/newtask.html', function (modal) {
29     $scope.taskModal = modal;
30   }, {
31     scope: $scope,
32     animation: 'slide-in-up'
33   });
34
35   // Called when the form is submitted
36   $scope.createTask = function (task) {
37     $scope.tasks.push({
38       title: task.title
39     });
40     $scope.taskModal.hide();
41     task.title = "";
42   };
43
44   // Open our new task modal
45   $scope.newTask = function () {
46     $scope.taskModal.show();
47   };
48
49   // Close the new task modal
50   $scope.closeNewTask = function () {
51     $scope.taskModal.hide();
52   };
53 };
```

Final Run



Unit Testing

❖ <https://docs.angularjs.org/guide/unit-testing>

❖ **Tools for testing angularjs applications:**

❖ **Karma** - Javascript command line tool

❖ **Jasmine** - framework for testing javascript

Installation

- ❖ Go to your angular project folder in node js terminal and execute the following commands:
- ❖ `npm init`
- ❖ `npm install angular --save`
- ❖ `npm install -g karma-cli`
- ❖ `npm install karma-jasmine jasmine-core --save-dev`
- ❖ `npm install karma-phantomjs-launcher --save-dev`
- ❖ `npm install angular-mocks --save-dev`

Karma Config File

Create a config file using the command:

karma init

By default it creates a config file with the name

karma.conf.js

We can specify the config file name as follows:

karma init my.conf.js

It asks questions about the testing framework,

browser as shown in the screenshot.

```
C:\Users\Raghu\Downloads\Tutorial 5\Tutorial 5\AngularBasic\AngularBasic>karma init my.conf.js
```

```
Which testing framework do you want to use ?  
Press tab to list possible options. Enter to move to the next question.
```

```
> jasmine
```

```
Do you want to use Require.js ?  
This will add Require.js plugin.  
Press tab to list possible options. Enter to move to the next question.
```

```
> no
```

```
Do you want to capture any browsers automatically ?  
Press tab to list possible options. Enter empty string to move to the next question.
```

```
> Chrome
```

```
>
```

```
What is the location of your source and test files ?  
You can use glob patterns, eg. "js/*.js" or "test/**/*.Spec.js".  
Enter empty string to move to the next question.
```

```
> js/*.js
```

```
> *.js
```

```
21 09 2015 22:26:57.736:WARN [init]: There is no file matching this pattern.
```

```
>
```

```
Should any of the files included by the previous patterns be excluded ?  
You can use glob patterns, eg. "**/*.swp".  
Enter empty string to move to the next question.
```

```
>
```

```
Do you want Karma to watch all the files and run the tests on change ?  
Press tab to list possible options.
```

```
> yes
```

Karma Config File

Open the config file and add angular, ngMock locations to the files parameter:

files: [

 'node_modules/angular/angular.js',

 'node_modules/angular-mocks/angular-mocks.js',

 'js/*.js',

 '*.js'

]

Karma Config file changes - Ionic

```
files: [  
  'js/*.js',  
  'www/js/*.js',  
  'www/lib/ionic/js/ionic-angular.min.js',  
  'node_models/angular-mocks/angular-mocks.js'  
],
```


Jasmine

- <http://jasmine.github.io/1.3/introduction.html>
- Jasmine is a behavior driven development framework for testing Javascript code.
- **Test Suite:** A test suite begins with a call to the global Jasmine function “describe” with two parameters: a string and a function.
- **Test Specification:** A test spec begins with a call to the global jasmine function “It” with two parameters: a string and a function.
- **Assertions:** Expectations and Matchers are used for assertions.
- eg: `expect(true).toBe(true);`
- Actual Expected

Angular JS Array Example

```
var app = angular.module('ArrayExample', []);

app.controller('myController', function($scope) {
    $scope.names = [
        {firstname:'Ravi kiran',   lastname:'Yadavalli' , country:'India'},
        {firstname:'John',        lastname:'Doe' ,          country:'USA'},
        {firstname:'Pradyumna',    lastname:'Doddala',       country:'India'},
        {firstname:'Xing',         lastname:'Wong',          country:'China'},
        {firstname:'Ragunandan Rao', lastname:'Malangully' , country:'India'},
        {firstname:'Guru',         lastname:'Mannava',       country:'India'},
        {firstname:'Tony',         lastname:'Williams' ,     country:'USA'}
    ];

    $scope.fullName= function(first, last) {
        return last + " " + first;
    }

});
```

Example Test Case

```
describe('myController', function () {
  beforeEach(module('ArrayExample'));

  var $controller;

  beforeEach(inject(function(_$controller_){
    // The injector unwraps the underscores (_) from around the parameter names when matching
    $controller = _$controller_;
  }));

  describe('fullName', function() {
    it('Tests fullName function of myController', function() {
      var $scope = {};
      var controller = $controller('myController', { $scope: $scope });
      var firstname = 'John';
      var lastname = 'Doe';
      expect($scope.fullName(firstname, lastname)).toEqual('John Doe'); // succeeds
      expect($scope.fullName('Tony' , 'Willams')).toEqual('John Doe'); // fails
    });
  });
});
```

Ionic Unit Testing - Controller

```
21 .controller('TodoCtrl', function ($scope, $ionicModal) {
22   $scope.tasks = [
23     { title: 'Read the tasks' },
24     { title: 'Get the book' },
25     { title: 'Go to College' }
26   ];
27   // Create and load the Modal
28   $ionicModal.fromTemplateUrl('views/newtask.html', function (modal) {
29     $scope.taskModal = modal;
30   }, {
31     scope: $scope,
32     animation: 'slide-in-up'
33   });
34
35   // Called when the form is submitted
36   $scope.createTask = function (task) {
37     $scope.tasks.push({
38       title: task.title
39     });
40     // $scope.taskModal.hide();
41     task.title = "";
42   };
43
44   // Open our new task modal
45   $scope.newTask = function () {
46     $scope.taskModal.show();
47   };
48
49   // Close the new task modal
50   $scope.closeNewTask = function () {
51     $scope.taskModal.hide();
52   };
53 });
```

Ionic Unit Testing - Test case

todo-test.js www/tests

```
1 describe('TodoCtrl', function() {
2   var scope;
3
4   beforeEach(angular.mock.module('todo'));
5   beforeEach(angular.mock.inject(function($rootScope, $controller) {
6     scope = $rootScope.$new();
7     $controller('TodoCtrl', {$scope: scope});
8   }));
9
10  it("Checks the task creation", function () {
11    var size = scope.tasks.length;
12    scope.createTask({ title: 'Hello' });
13    expect(scope.tasks.length).toEqual(size+1);
14  });
15 });
```

Executing Test Case

To execute the test cases use the following command:

karma start my.conf.js

It will execute test cases in all the .js files specified in the config file.

```
C:\Users\Raghu\Downloads\Tutorial 5\Tutorial 5\AngularBasic\AngularBasic>karma start my.conf.js
05 03 2016 00:23:59.859:WARN [watcher]: Pattern "C:/Users/Raghu/Downloads/Tutorial 5/Tutorial 5/AngularBasic/AngularBasi
c/www/lib/ionic/js/ionic-angular.min.js" does not match any file.
05 03 2016 00:23:59.890:WARN [karma]: No captured browser, open http://localhost:9876/
05 03 2016 00:23:59.906:INFO [karma]: Karma v0.13.10 server started at http://localhost:9876/
05 03 2016 00:23:59.922:INFO [launcher]: Starting browser Chrome
05 03 2016 00:24:05.359:INFO [Chrome 48.0.2564 <Windows 10 0.0.0>]: Connected on socket u601KBD0kHkGJZG-AAAA with id 522
41863
Chrome 48.0.2564 <Windows 10 0.0.0> myController fullName Tests the Full name feature of the application FAILED
    Expected 'Doe John' to equal 'John Doe'.
    at Object.<anonymous> (C:/Users/Raghu/Downloads/Tutorial 5/Tutorial 5/AngularBasic/AngularBasic/js/test.js:1
7:52)
    Expected 'Willams Tony' to equal 'John Doe'.
    at Object.<anonymous> (C:/Users/Raghu/Downloads/Tutorial 5/Tutorial 5/AngularBasic/AngularBasic/js/test.js:1
8:51)
Chrome 48.0.2564 <Windows 10 0.0.0>: Executed 1 of 1 <1 FAILED> ERROR (0.047 secs / 0.056 secs)
```

Note

- To run any project that deals with npm, open project folder and execute

npm install

- This will install all the dependencies given in package.json automatically.

References

<http://ionicframework.com/>

<https://nodejs.org/en/>

<https://www.visualstudio.com/>

Unit Testing:

<https://docs.angularjs.org/guide/unit-testing>

<http://www.tuesdaydeveloper.com/2013/06/angularjs-testing-with-karma-and-jasmine/>

Thank You

A solid green horizontal bar at the bottom of the slide.