MIRACLE
SOFTWARE SYSTEMS

Building an IONIC 3 App that Detects BLE Beacons (Estimote)

Mini Lab | Digital Summit 2019

Building an IONIC 3 App that detects BLE Beacons (Estimote)

Introduction

This document contains a step-by-step process to create a hybrid mobile app, where a group of Beacons are kept in different regions and identify them through Bluetooth or Location manager.

Pre-Requisites

All attendees must have their workstation (with Internet) to participate in the lab (Both PC and MAC are compatible). The following pre-requisites will help you to make the Hands-on Lab experience easier.

- Node JS and npm installed
- Cordova
- Ionic Framework
- Text editor (Visual Studio Code is preferable)
- Android sdk

Technologies Involved

- Ionic Framework
- Cordova
- HTML/CSS
- Typescript
- Angular 7

Lab Steps

Let's get started with the lab!

Step #1 | Installing Android SDK

Go to **http://www.android.pk/android-sdk.php** and download **android-sdk_r16-windows.zip** or installer_r16_windows.exe to and run SDK Manager into local PC.

Step #2 | Create a New Ionic Project

To create/start a new project in Ionic 3 CLI, we need to give a below command,

Ionic start <application name> <template> --type=ionic-angular (or)

Tabs	A starting project with a simple tabbed interface
Blank	A blank starter project
Sidemenu	A starting project with a side menu with navigation in the content area
Super	A starting project complete with pre-built pages, providers and best practices for Ionic development
Conference	A project that demonstrates a real-world application
Tutorial	A tutorial-based project that goes along with the Ionic documentation
AWS	AWS Mobile Hub Starter

To create/start a new project in Ionic 4 cli, we need to give a below command,

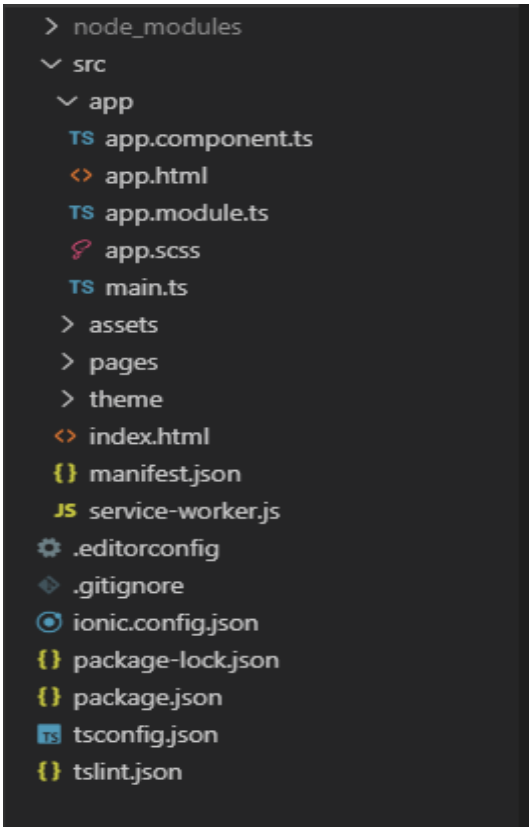
Ionic start <application name> <template> blank, tabs

We will be having following starter templates in ionic3 Framework,

In this lab we are going to use blank template and start implementing the actual application.

E.g. : ionic start estimoteBeacon blank

Give the above command in the command prompt, once you give the above command, the ionic application will be created with the following folder structure as shown in the below figure.

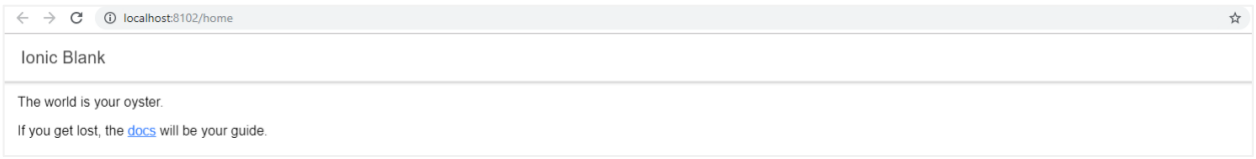


Step #3 | Running the Application

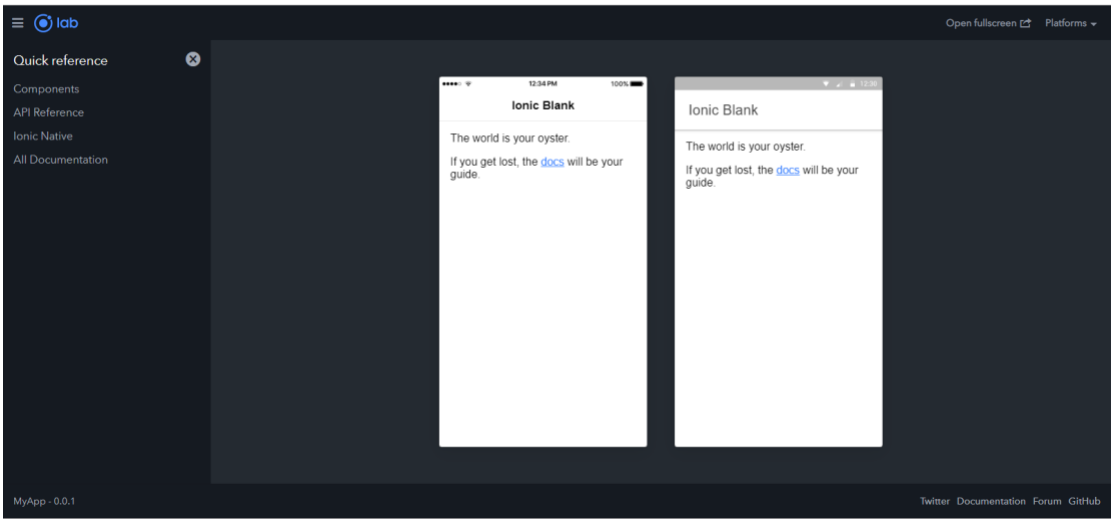
Before providing the run command, we need to route to the current application folder and give the following commands.

Run on Browser - ionic serve. To run on Mobile simulator - ionic serve -l

If you run the application in the browser, you will be able to see the output as shown in the below figure,



Run the application on a simulator, and the output will be as shown below. Here if you observe you can notice that the output is in two different platforms one is in Android and another one is in iOS.



Step #4 | Beacon Monitoring Application

A Beacon is a small Bluetooth radio transmitter. It's kind of like a lighthouse. It repeatedly transmits a single signal that other devices like mobile phones can receive.

Every Beacon can be segregated using an identifier in the form of Major, Minor from the beacons itself or UUID unique values.

In this case we have used Minor values as our unique values, and it varies from 1 to 99999.

Step #5 | Add Ibeacon Plugin to the app

In this beacon application we are using **ionic-native Ibeacon** plugin. Install it by running the below commands respectively.

$ ionic cordova plugin add cordova-plugin-ibeacon
$ npm install --save @ionic-native/ibeacon@4

Once it is installed successfully we need to add this in **app.module.ts** so import it and declare it in the providers array.

Step #6 | Creating Service Provider

In this step, we'll create a Beacon Service that will be used in our components or classes.

Run the command below to create a new service provider.

$ ionic g provider beacon

Replace the code snippet for the beacons provider.

Code Snippet : Beacon.ts [Plese refer to cheat sheet]

Step #7 | Creating Pages in Beacon App

In this Beacon application we have to create 2 pages home page and details page.

The Home Page contains all the list of active beacons near us and the details Page will contains the section of which beacon we are approaching.

Home page will be generated by default but we need to delete that page and create it once again in order to perform lazy loading which boosts up's our app performance.

So delete the home page completely and run the command below to generate new page.

$ ionic g page home

Once it is generated go to app.component.ts remove the import of **HomePage** and change the **rootPage** to type string as shown below.

```
export class MyApp {
  rootPage:any = 'HomePage';
```

In this page, we will be displaying list of beacons data by using beacon service provider.

Replace the code snippet for implementing the beacons report list in the application

Code Snippet : HomePage.ts [Plese refer to cheat sheet]

To generate a details page in the application run the following command

$ ionic g page details

The details page contains information specific to a respective beacon according to their minor values from the home page.

Replace the code snippet for implementing the beacons specific details in the application

Code snippet : DetailsPage.ts [please refer to cheat sheet]

Step #8 | Generating and installing the APK

In this step we will run the application in our android device.

We can either run on our devices or else build an .apk file and install in our device and then run it.

To directly run in our android device run the command as shown below.

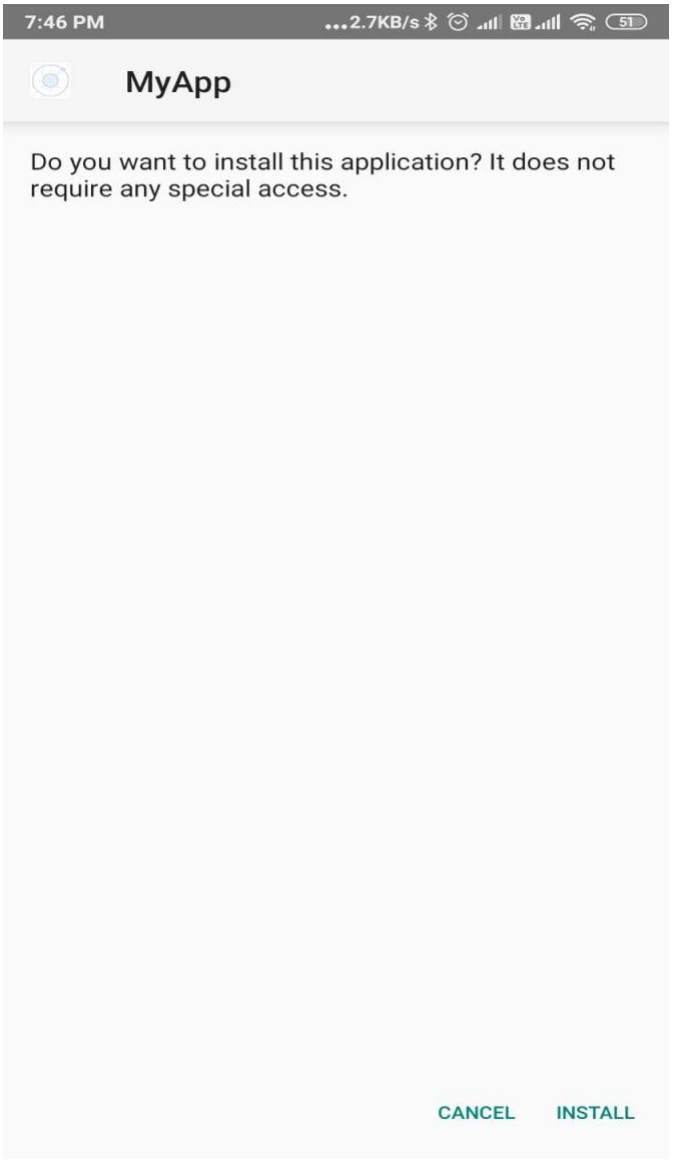
$ ionic cordova run android

To build an .apk file and install it in our android device run the command as shown below.

$ ionic cordova build android

Note: you will find the app-debug.apk file in the following path **project_name\platforms\android\app\build\outputs\apk\debug.**

After building of your.apk, copy it into your device. Open it and click on INSTALL.

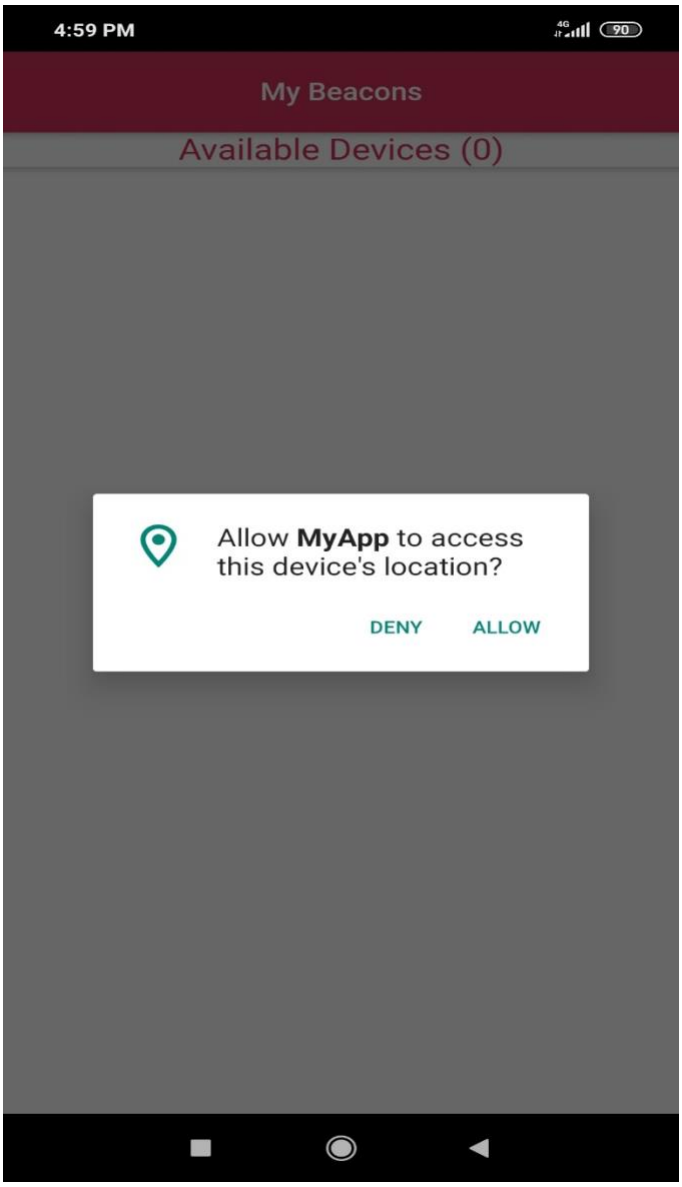


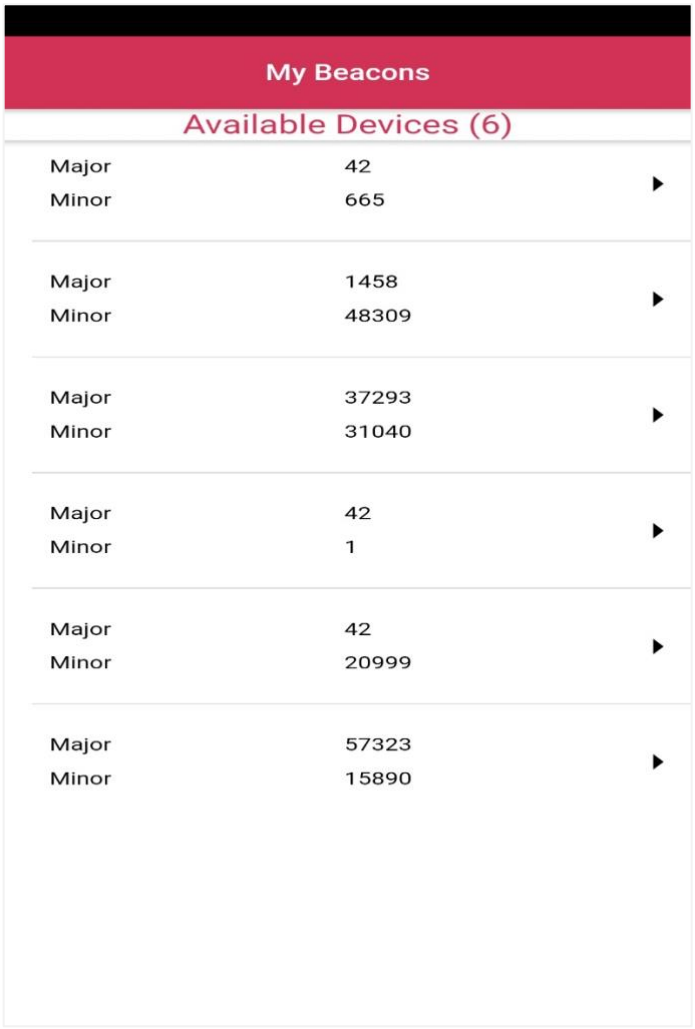
Step #9 | Application Testing

After installing your app, click on the app icon as shown below.

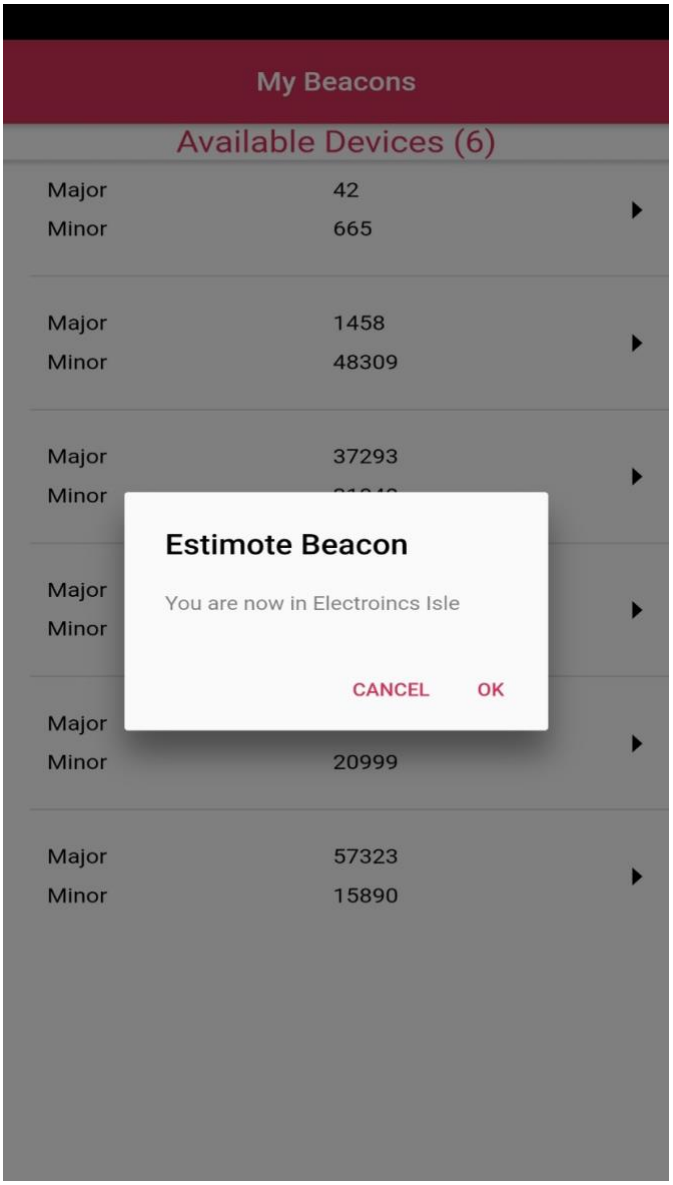
The splash screen of the app will be displayed as shown in the below image.

Now you will be asked to enable Bluetooth and Location permissions as shown below. Click on **ALLOW** to move forward.



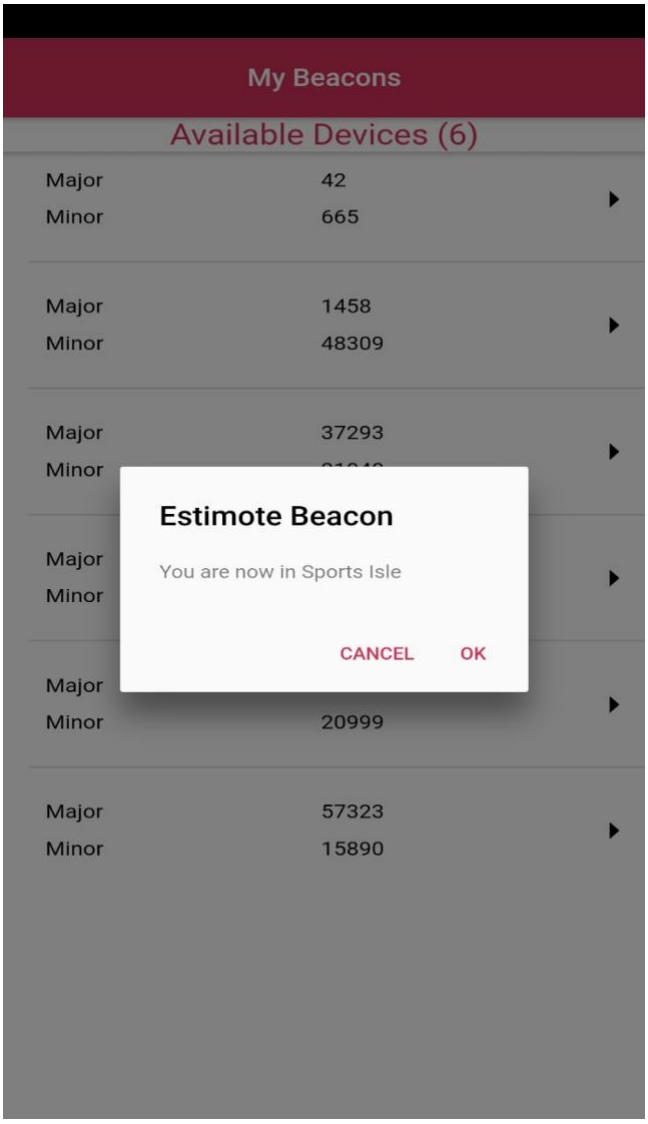


Once the scanning is completed, you can find all the nearby Beacons displayed in Available Devices. You can now view its detail by a click.



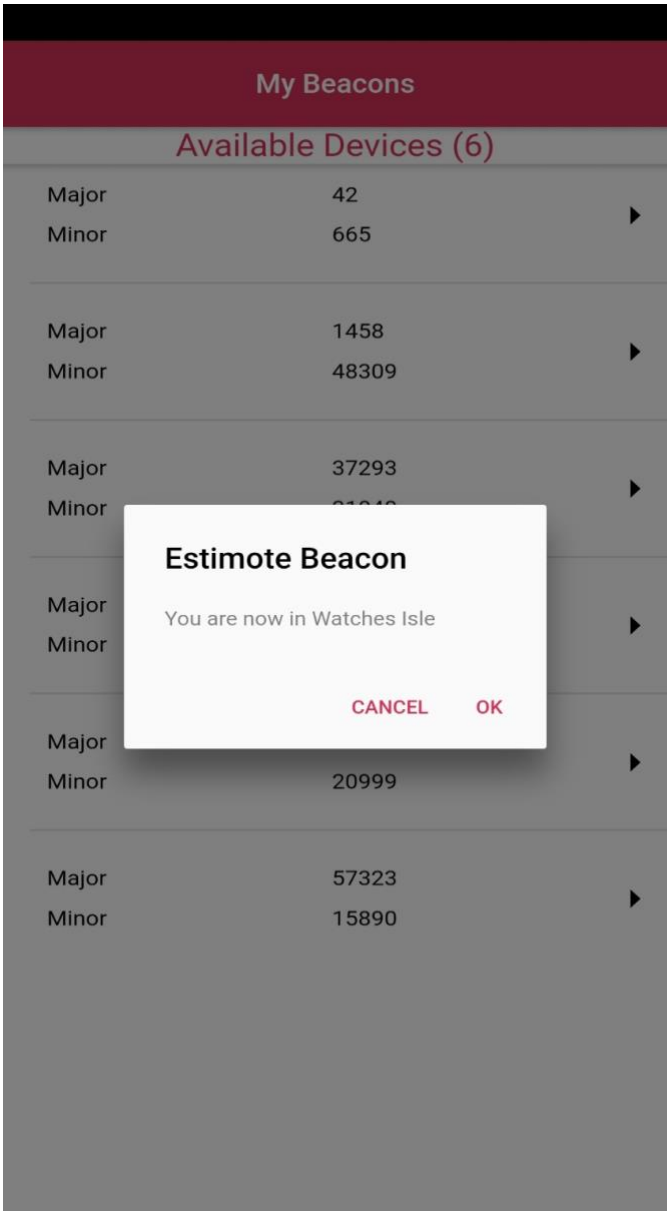
It will show you Beacons major, minor (values). For this Beacon, minor value is: 665.
It will show an alert message on what type of activity is being done by this Beacon. Here it states, 'You are now in Electronic Isle'. Then click on Ok.

The output screen for this beacon will be displayed as shown in the above image.

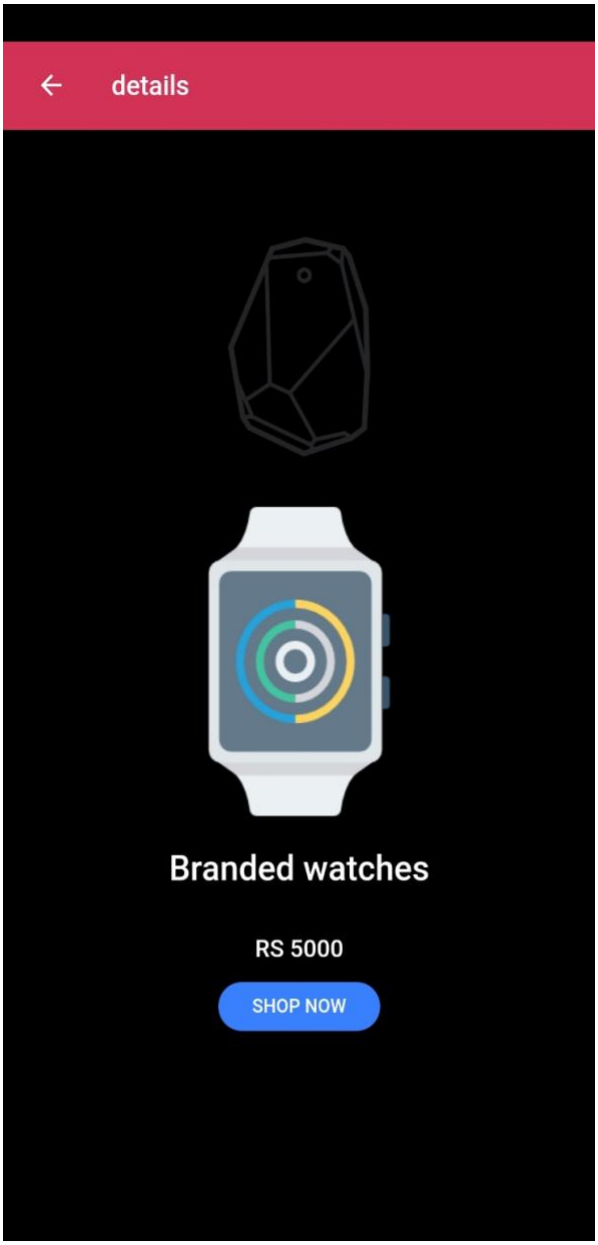


It will show you Beacons major, minor (values). For this Beacon, minor value is: 48309. It will show an alert message on what type of activity is being done by this Beacon. Here it states, 'You are now in Sports Isle'. Then click on Ok.

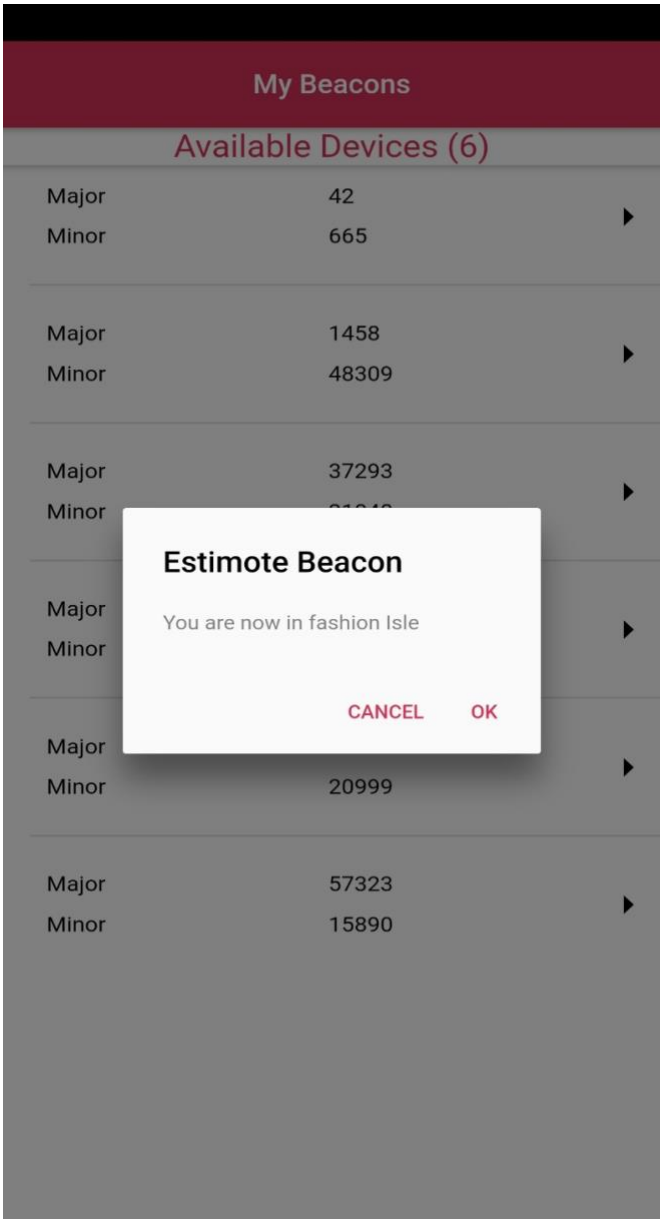
The output screen for this beacon will look as shown in the above image.



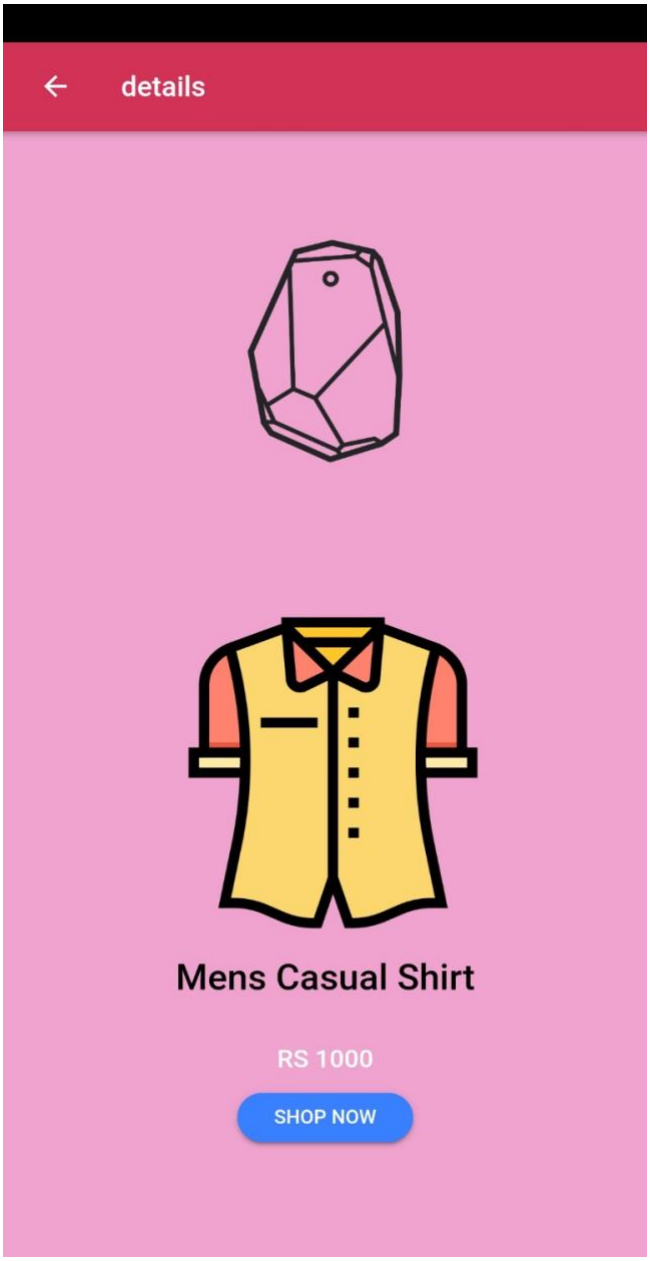
It will show you Beacons major, minor (values). For this Beacon, minor value is: 31040. It will show an alert message on what type of activity is being done by this Beacon. Here it states, 'You are now in Watches Isle'. Then click on Ok.



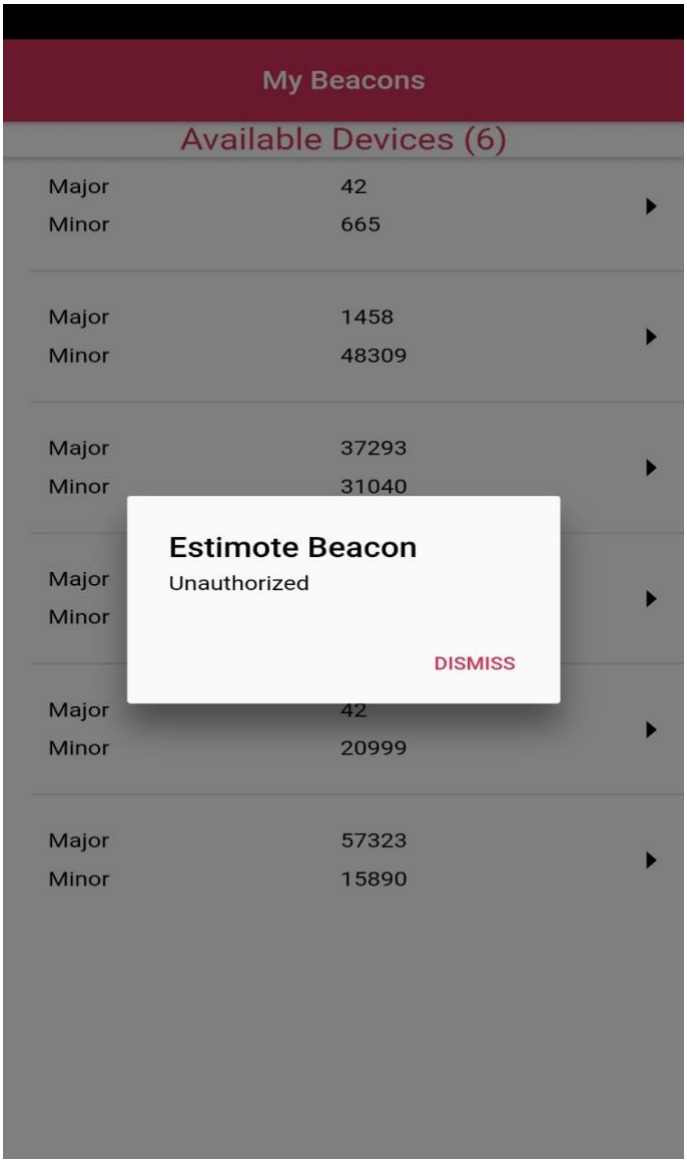
The output screen for this beacon will be displayed as shown in the above image.



It will show you Beacons major, minor (values). For this Beacon, minor value: 1. It will show an alert message on what type of activity is being done by this Beacon. Here it states, 'You are now in Fashion Isle'. Then click on Ok.



The output screen for this beacon will be displayed as shown in the above image.



If you select the third beacon, it will show an alert message that this beacon is Unauthorized. Then click on Ok.