

COMP2140 – Web/Mobile Programming

Lecture Week 10: React Native – Integrating Maps into React Native

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Course Updates

Issue/Feedback	Change
Assessment 2: React Web Project	<ul style="list-style-type: none">• Due Friday 6 Oct at 3pm• If you have issues with Gradescope not uploading, please use alternate link on Blackboard course site.• If npm build fails, Tutors will check this manually.

Introduction to A3 – Getting Started Guide

echovideo Library Courses Collections **Create**

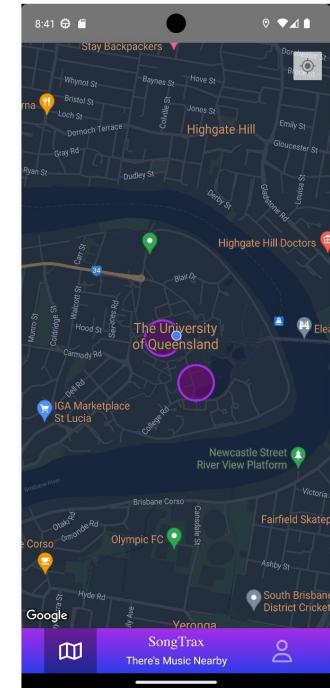
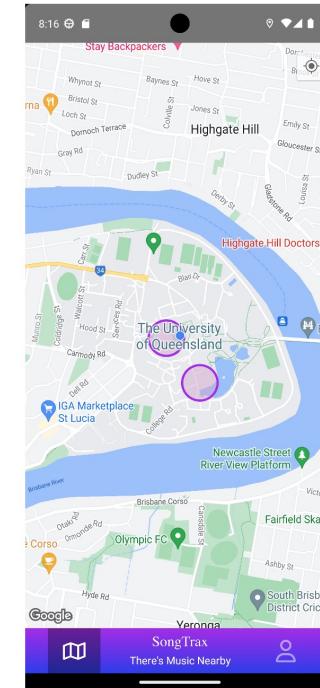
RESET LMS LINK UNLINK LMS COURSE COMP2140 - COMP2140_STLUC_S2_2023 Web/Mobile Programming

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Week 10: Getting Started with A3 React Native App

The Map Page (at a location)



React Native Recap (from Week 9)

React Native Components

REACT NATIVE UI COMPONENT	ANDROID VIEW	IOS VIEW	WEB ANALOG	DESCRIPTION
<code><View></code>	<code><ViewGroup></code>	<code><UIView></code>	A non-scrolling <code><div></code>	A container that supports layout with flexbox, style, some touch handling, and accessibility controls
<code><Text></code>	<code><TextView></code>	<code><UITextView></code>	<code><p></code>	Displays, styles, and nests strings of text and even handles touch events
<code><Image></code>	<code><ImageView></code>	<code><UIImageView></code>	<code></code>	Displays different types of images
<code><ScrollView></code>	<code><ScrollView></code>	<code><UIScrollView></code>	<code><div></code>	A generic scrolling container that can contain multiple components and views
<code><TextInput></code>	<code><EditText></code>	<code><UITextField></code>	<code><input type="text"></code>	Allows the user to enter text

From <https://reactnative.dev/docs/intro-react-native-components>
&

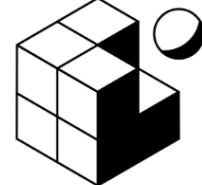
<https://reactnative.dev/docs/components-and-apis>

External Stylesheet

```
1 import React from 'react';
2 import { ScrollView, Text, View, Image } from 'react-native';
3 import styles from './AppStyles'; // Import the separate stylesheet
4
5 const App = () => {
6   return (
7     <ScrollView>
8       <Text style={styles.heading}>Hello COMP2140!</Text>
9       <View style={styles.textContainer}>
10         <Text>This a simple React Native example.</Text>
11         <Text>It only includes a heading, some text, and an image.</Text>
12         <Image
13           source={require('./assets/snack-icon.png')}
14           style={styles.image}
15         />
16       </View>
17     </ScrollView>
18   );
19 }
20
21 export default App;
22
23 |
```

Hello COMP2140!

This a simple React Native example.
It only includes a heading, some text, and an image.



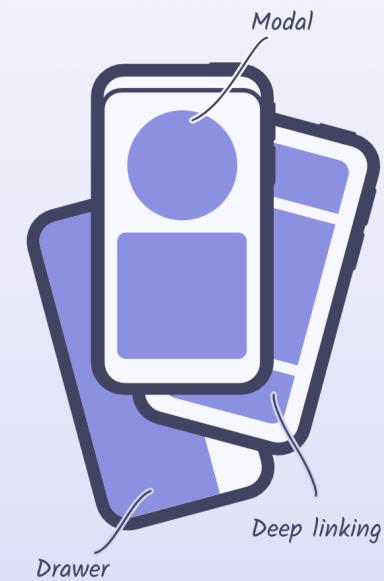
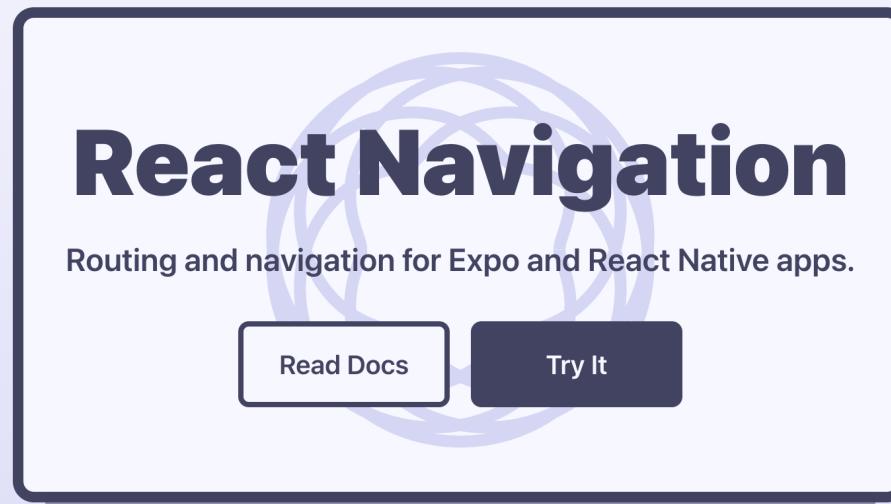
```
1 import { StyleSheet } from 'react-native';
2
3 const styles = StyleSheet.create({
4   heading: {
5     fontSize: 24,
6     fontWeight: 'bold',
7     textAlign: 'center',
8     margin: 10,
9   },
10  textContainer: {
11    padding: 16, // Padding for the text container
12  },
13  image: {
14    width: 100,
15    height: 100,
16    padding: 16, // Padding for the image
17  },
18 });
19
20 export default styles;
21 |
```

What is the React Router equivalent?

Support Ukraine [Help Provide Humanitarian Aid to Ukraine.](#)

 React Navigation Docs Blog Help 6.x ▾

[GitHub](#)    Search  

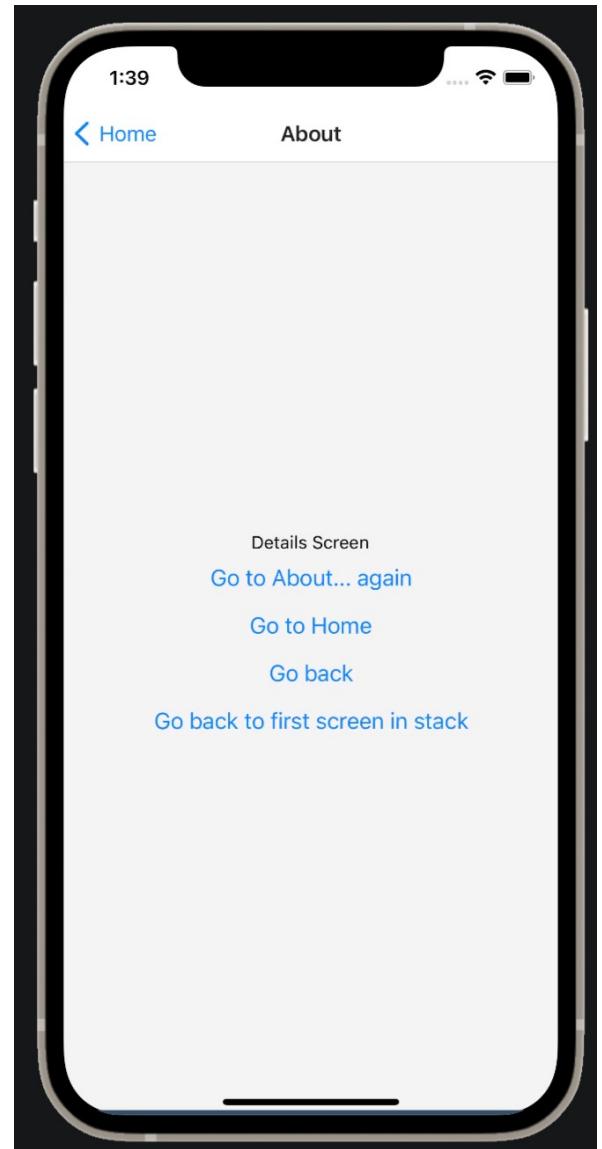


 Coming from an older version? Check out our [migration guides](#).

Stack Navigation

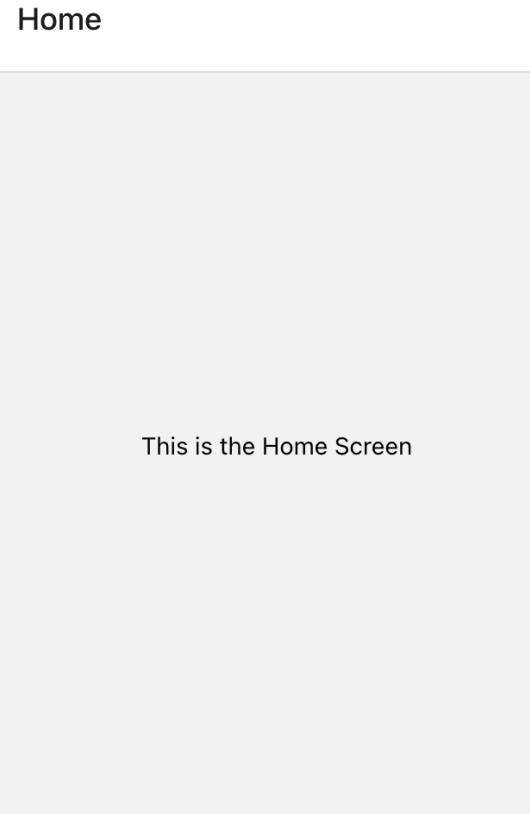
```
1 import * as React from 'react';
2 import { Button, View, Text } from 'react-native';
3 import { NavigationContainer } from '@react-navigation/native';
4 import { createNativeStackNavigator } from '@react-navigation/native-stack';
5 import About from './components/About';
6 import Home from './components/Home';
7
8 const Stack = createNativeStackNavigator();
9
10 function App() {
11   return (
12     <NavigationContainer>
13       <Stack.Navigator initialRouteName="Home">
14         <Stack.Screen name="Home" component={Home} />
15         <Stack.Screen name="About" component={About} />
16       </Stack.Navigator>
17     </NavigationContainer>
18   );
19 }
20
21 export default App;
22
```

```
1 import React from 'react';
2 import { View, Text, Button } from 'react-native';
3
4 const About = ({ navigation }) => {
5   return (
6     <View style={{ flex: 1, alignItems: 'center', justifyContent: 'center' }}>
7       <Text>Details Screen</Text>
8       <Button
9         title="Go to About... again"
10        onPress={() => navigation.push('About')}
11      />
12       <Button title="Go to Home" onPress={() => navigation.navigate('Home')} />
13       <Button title="Go back" onPress={() => navigation.goBack()} />
14       <Button
15         title="Go back to first screen in stack"
16        onPress={() => navigation.popToTop()}
17      />
18     </View>
19   );
20 }
21
22 export default About;
23
```

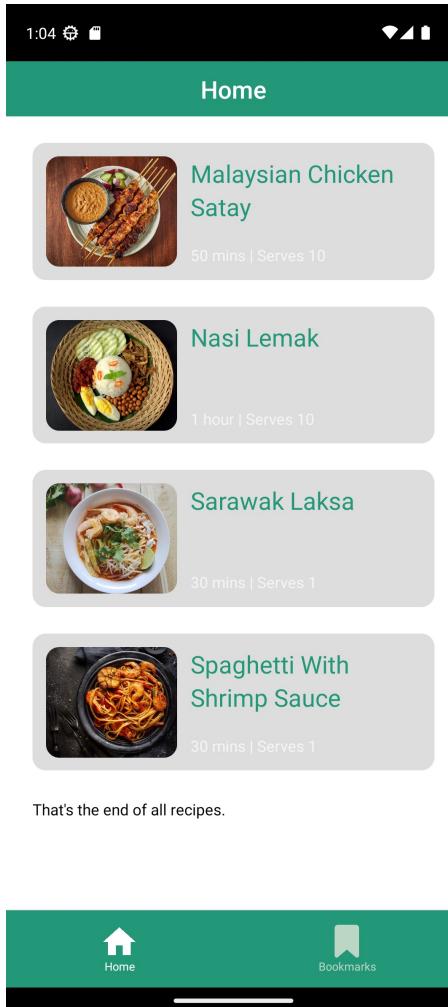


Tab Navigation

```
1 import { Text, View } from 'react-native';
2 import { NavigationContainer } from '@react-navigation/native';
3 import { createBottomTabNavigator } from '@react-navigation/bottom-tabs';
4
5 function Home() {
6   return (
7     <View style={{ flex: 1, justifyContent: 'center', alignItems: 'center' }}>
8       <Text>This is the Home Screen</Text>
9     </View>
10  );
11}
12
13 function About() {
14   return (
15     <View style={{ flex: 1, justifyContent: 'center', alignItems: 'center' }}>
16       <Text>This is the About Screen</Text>
17     </View>
18  );
19}
20
21 const Tab = createBottomTabNavigator();
22
23 function BottomTabs() {
24   return (
25     <Tab.Navigator>
26       <Tab.Screen name="Home" component={Home} />
27       <Tab.Screen name="Settings" component={About} />
28     </Tab.Navigator>
29  );
30}
31
32 export default function App() {
33   return (
34     <NavigationContainer>
35       <BottomTabs />
36     </NavigationContainer>
37   );
38}
39
```



Week 10 Contact – Recipe App



```
36     function tabOptions(icon) {
37       return {
38         tabBarIcon: ({ focused }) => <TabIcon focused={focused} icon={icon} />,
39         tabBarActiveTintColor: colors.white,
40         tabBarInactiveTintColor: colors.lightLime,
41         headerStyle: {
42           backgroundColor: colors.darkGreen,
43           height: 50,
44         },
45         headerTintColor: colors.white,
46         headerTitleAlign: "center",
47         headerTitleStyle: {
48           fontSize: sizes.body2,
49         },
50         tabBarStyle: {
51           height: 70,
52           padding: sizes.padding,
53           backgroundColor: colors.darkGreen
54         },
55         tabBarLabelStyle: {
56           padding: sizes.padding / 2
57         }
58       };
59     }
```

Week 10 Contact / components/Tabs.js

Documentation: <https://reactnavigation.org/docs/bottom-tab-navigator>

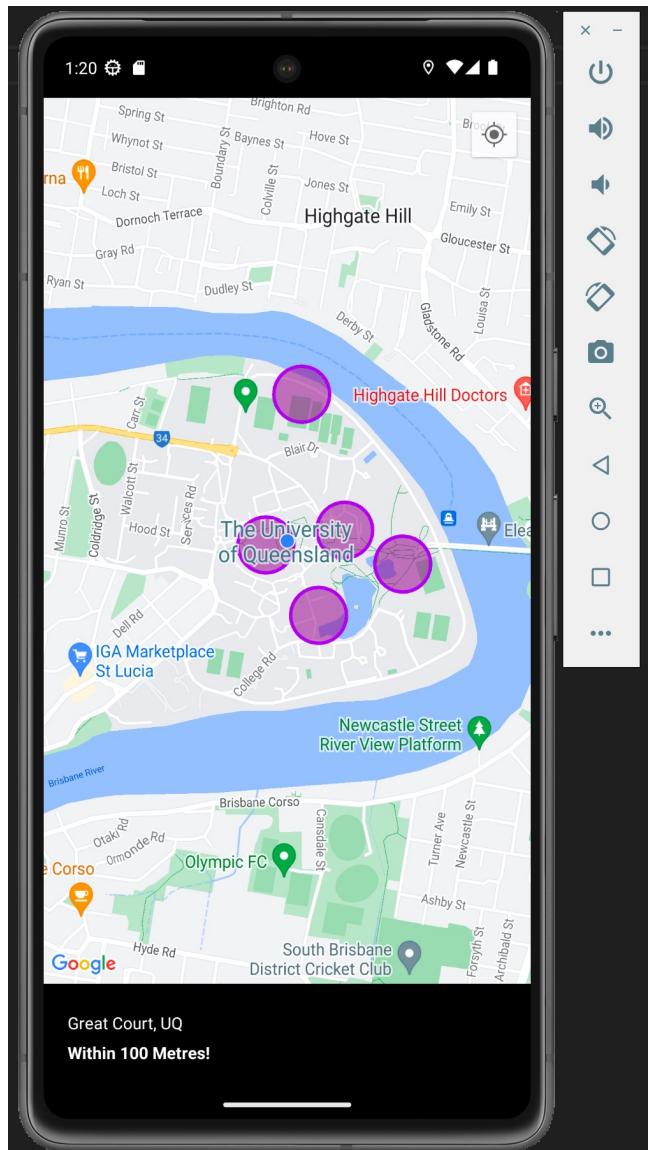
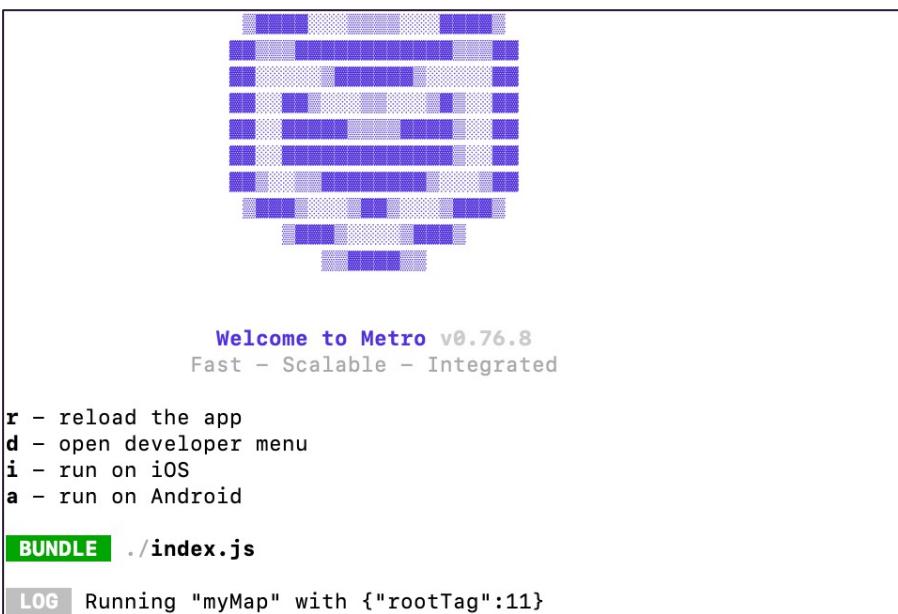
Maps in React Native

The Mapview component

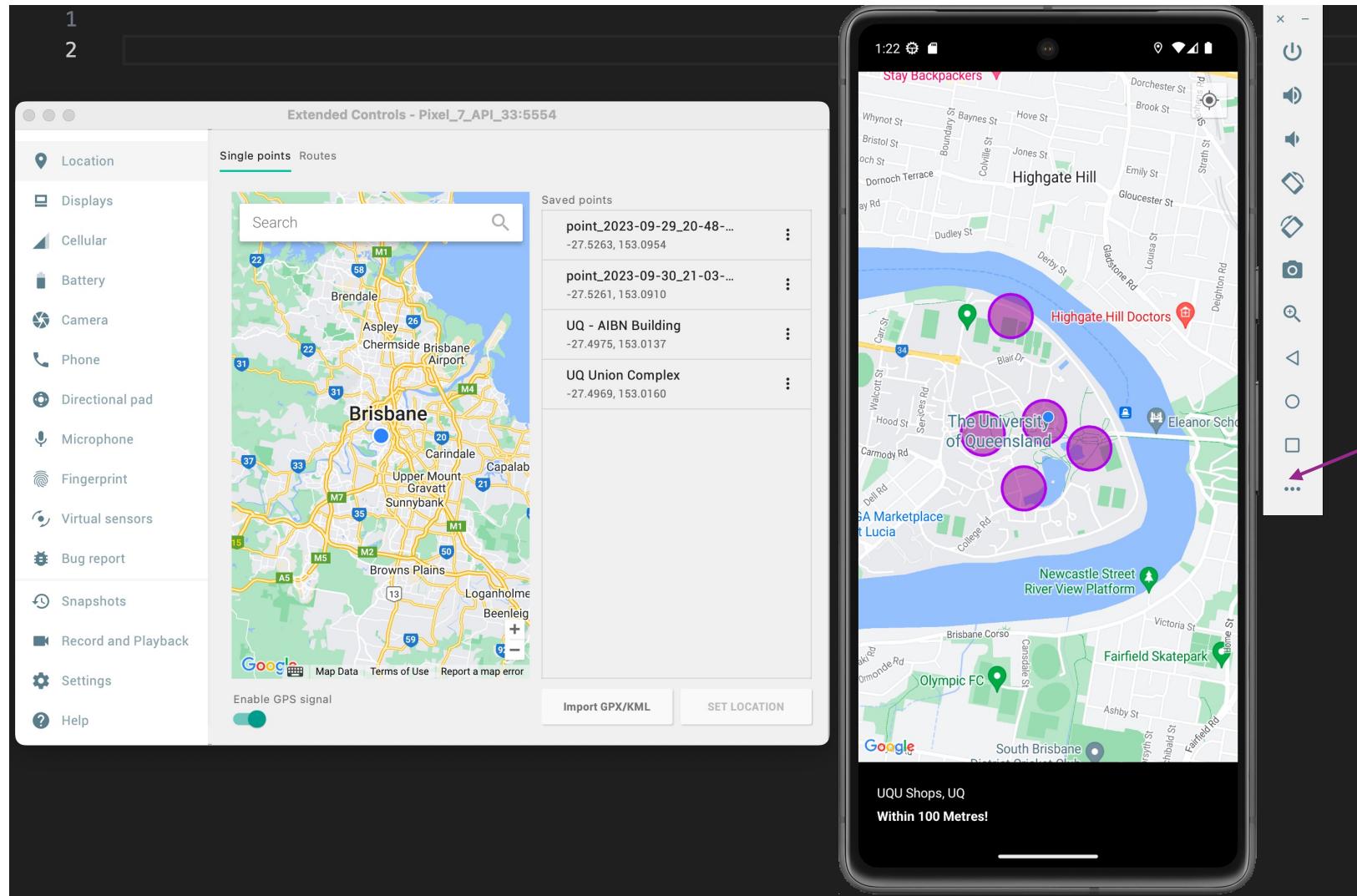
```
uqabakh1@itali-79emd6m myMap % npx react-native run-android
info Starting JS server...
info Installing the app...

> Task :app:installDebug
Installing APK 'app-debug.apk' on 'Pixel_7_API_33(AVD) - 13' for :app:debug
Installed on 1 device.

BUILD SUCCESSFUL in 22s
72 actionable tasks: 2 executed, 70 up-to-date
info Connecting to the development server...
info Starting the app on "emulator-5554"...
Starting: Intent { act=android.intent.action.MAIN cat=[android.intent.category.LAUNCHER] cmp=com.mymap/.MainActivity }
```



The Mapview – Setting Location in Emulator



Week 11 Contact – Locations

```
3 export const locations = [
4     {"id": "12", "location": "Mount Gravatt Tafe", "suburb": "Mount Gravatt East", "state": "QLD", "country": "Australia", "lat": -27.4918, "long": 153.0142174835569},
5     {"id": "11", "location": "Kennedys Point", "suburb": "Bonnie Doon", "state": "VIC", "country": "Australia", "lat": -37.8125, "long": 145.141778125},
6     {"id": "10", "location": "Maroochydore Beaches", "suburb": "Maroochydore", "state": "QLD", "country": "Australia", "lat": -27.4333, "long": 153.02583333333334},
7     {"id": "9", "location": "Surfers Paradise Beach", "suburb": "Surfers Paradise", "state": "QLD", "country": "Australia", "lat": -27.425, "long": 153.02583333333334},
8     {"id": "8", "location": "Brisbane City Botanic Gardens", "suburb": "Brisbane", "state": "QLD", "country": "Australia", "lat": -27.425, "long": 153.02583333333334},
9     {"id": "7", "location": "The Wheel of Brisbane", "suburb": "South Bank", "state": "QLD", "country": "Australia", "lat": -27.425, "long": 153.02583333333334},
10    {"id": "6", "location": "Indooroopilly Shopping Centre", "suburb": "Indooroopilly", "state": "QLD", "country": "Australia", "lat": -27.425, "long": 153.02583333333334},
11    {"id": "5", "location": "UQ Sport Courts, UQ", "suburb": "St Lucia", "state": "QLD", "country": "Australia", "lat": -27.425, "long": 153.02583333333334},
12    |     |     | "country": "Australia", "latlong": "-27.49278717815242, 153.0142174835569"}, "lat": -27.425, "long": 153.02583333333334},
13    {"id": "4", "location": "UQU Shops, UQ", "suburb": "St Lucia", "state": "QLD", "country": "Australia", "lat": -27.425, "long": 153.02583333333334},
14    {"id": "3", "location": "Near UQ Lakes Bus Station, UQ", "suburb": "St Lucia", "state": "QLD", "country": "Australia", "lat": -27.425, "long": 153.02583333333334},
15    {"id": "2", "location": "General Purpose South, UQ", "suburb": "St Lucia", "state": "QLD", "country": "Australia", "lat": -27.425, "long": 153.02583333333334},
16    {"id": "1", "location": "Great Court, UQ", "suburb": "St Lucia", "state": "QLD", "country": "Australia", "lat": -27.425, "long": 153.02583333333334}
17];
```

Week 11 Contact – Maps - Dependencies

```
3  export const locations = [
5    // Import React Native Maps
6    import MapView, { Circle } from "react-native-maps";
7
8    // Import React Native Geolocation
9    import Geolocation from "@react-native-community/geolocation";
10   import { getDistance } from "geolib";
11
12   // Import Locations Data
13   import { locations } from "../data/locations";
14 ];
```

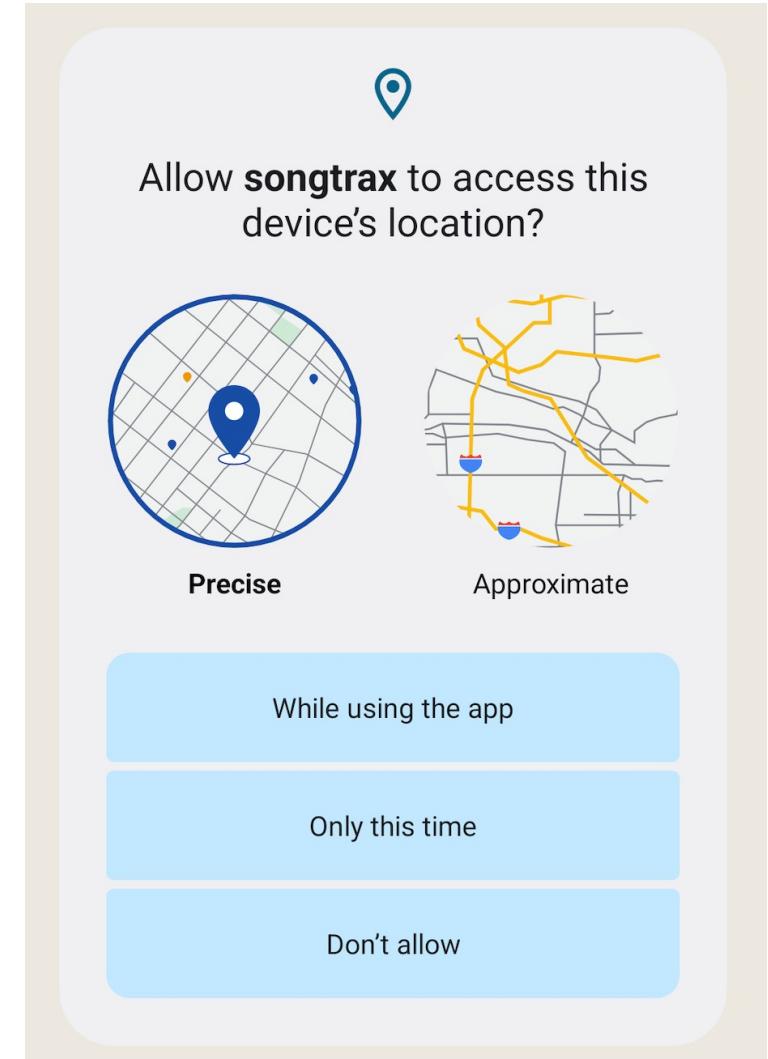
Week 11 Contact – MapView component

```
165   <MapView  
166     camera={{  
167       center: mapState.userLocation,  
168       pitch: 0, // Angle of 3D map  
169       heading: 0, // Compass direction  
170       altitude: 3000, // Zoom level for iOS  
171       zoom: 15 // Zoom level For Android  
172     }}  
173     showsUserLocation={mapState.locationPermission}  
174     style={styles.container}  
175   >  
176   {mapState.locations.map(location => (  
177     <Circle  
178       key={location.id}  
179       center={location.coordinates}  
180       radius={100}  
181       strokeWidth={3}  
182       strokeColor="#A42DE8"  
183       fillColor={colorScheme == "dark" ?  
184         "rgba(128,0,128,0.5)" :  
185         "rgba(210,169,210,0.5)"}  
186     />  
187   ))}  
188 </MapView>
```

Week 11 Contact / components/showmap.js

Week 11 Contact – MapView component

```
89     async function requestAndroidLocationPermission() {
90       try {
91         const granted = await PermissionsAndroid.request(
92           PermissionsAndroid.PERMISSIONS.ACCESS_FINE_LOCATION,
93           {
94             title: "Location Permission",
95             message: "This app will put your location on the map.",
96             buttonNeutral: "Ask Me Later",
97             buttonNegative: "Cancel",
98             buttonPositive: "OK"
99           }
100      );
101      if(granted === PermissionsAndroid.RESULTS.GRANTED) {
102        setMapState({
103          ...mapState,
104          locationPermission: true
105        });
106      }
107    }
108    catch(error) {
109      console.warn(error);
110    }
111  };
```



Week 11 Contact – MapView component

```
143 // Only watch the user's current location when device permission granted
144 if(mapState.locationPermission) {
145     Geolocation.watchPosition(
146         position => {
147             const userLocation = {
148                 latitude: position.coords.latitude,
149                 longitude: position.coords.longitude
150             }
151             const nearbyLocation = calculateDistance(userLocation);
152             setMapState({
153                 ...mapState,
154                 userLocation,
155                 nearbyLocation: nearbyLocation
156             });
157         },
158         error => console.log(error),
159         { enableHighAccuracy: true }
160     );
161 }
162 }
```

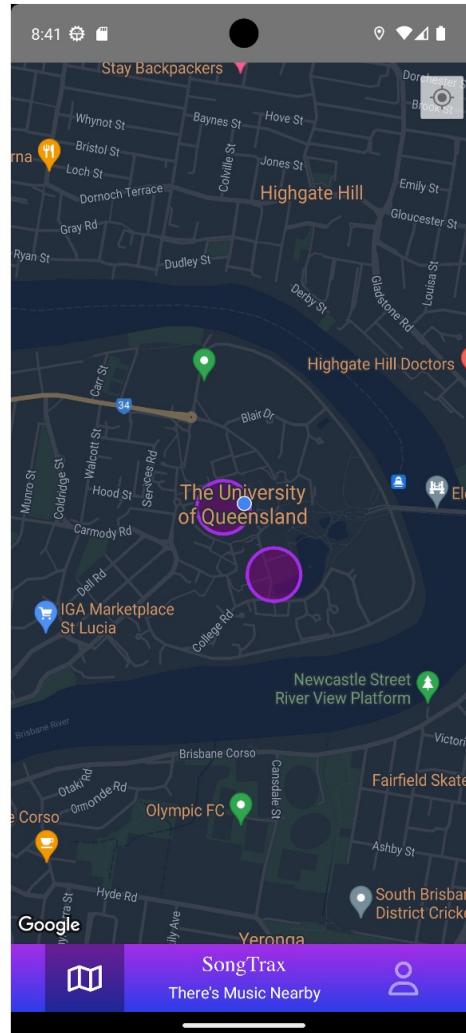
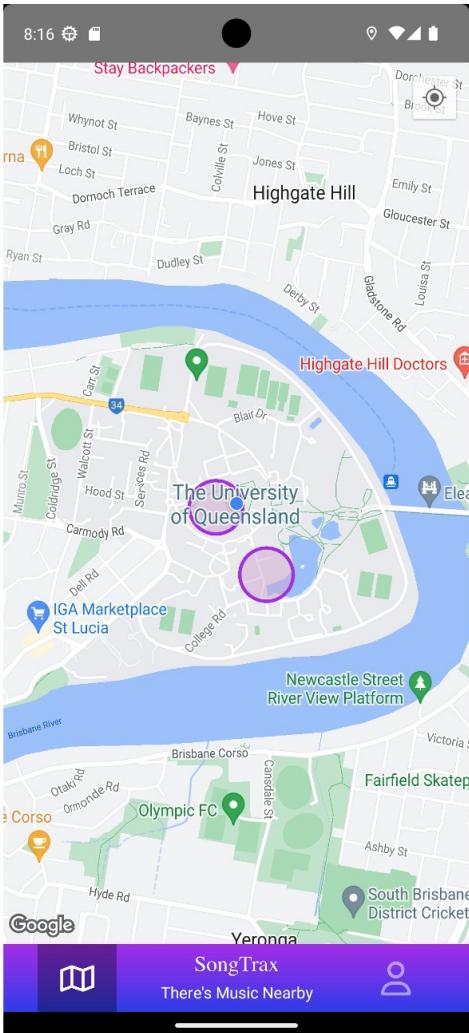
Week 11 Contact / components/showmap.js

Week 11 Contact – MapView component

```
125 // Function to retrieve location nearest to current user location
126 function calculateDistance(userLocation) {
127   const nearestLocations = mapState.locations.map(location => {
128     const metres = getDistance(
129       userLocation,
130       location.coordinates
131     );
132     location["distance"] = {
133       metres: metres,
134       nearby: metres <= 100 ? true : false
135     };
136     return location;
137   }).sort((previousLocation, thisLocation) => {
138     return previousLocation.distance.metres - thisLocation.distance.metres;
139   });
140   return nearestLocations.shift();
141 }
```

- After mapping and updating all location objects in the `mapState.locations` array, the code sorts the `nearestLocations` array in ascending order based on the `distance.metres` property.
- Finally, the `nearestLocations.shift()` method is called to remove and return the first element from the `nearestLocations` array, which, due to the sorting, is the location nearest to the `userLocation`.

A3 – React Native App



Uses

- Maps
- Tabs



CREATE CHANGE

Thank you