



# CM3131 Mobile Application Design and Development

Lecture 09

Firebase and Authentication

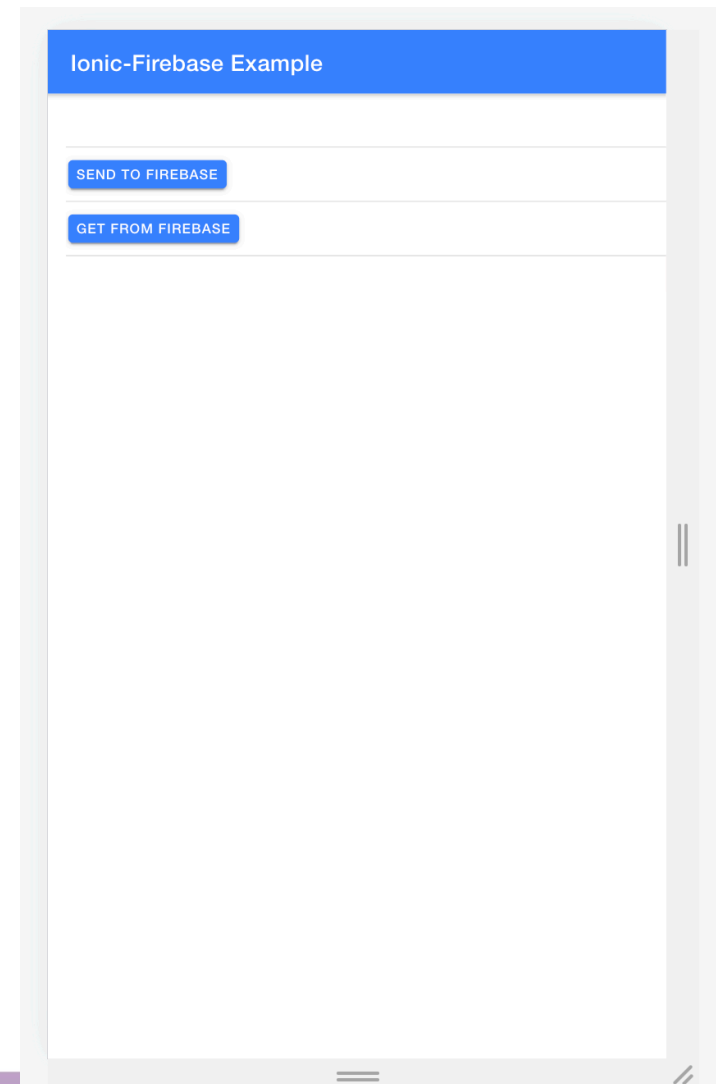


# Data Persistence using Firebase

Firebase is a platform developed by Google for creating mobile and web applications. It is free to use (for personal use) and the set up for the database is quick and easy.

# Firestore Project

We start by creating a simple app which will upload data to the Firestore Realtime database



# The App

Create an app in the usual way by writing an index.html file and linking it to an app.js file using the script tag. Make sure that the script tag property is set to:

`type="module"`

```
<script src="app.js" type="module" defer></script>
```



# Firestore Project

This creates the basic app template

```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <meta http-equiv="X-UA-Compatible" content="IE=edge">
6   <meta name="viewport" content="width=device-width, initial-scale=1.0">
7   <title>Document</title>
8   <!-- Ionic CDN -->
9   <script type="module" src="https://cdn.jsdelivr.net/npm/@ionic/core/dist/ionic/ionic.esm.js"></script>
10  <script nomodule src="https://cdn.jsdelivr.net/npm/@ionic/core/dist/ionic/ionic.js"></script>
11  <link rel="stylesheet" href="https://cdn.jsdelivr.net/npm/@ionic/core/css/ionic.bundle.css" />
12  <!-- App Scripts -->
13  <script src="data.js"></script>
14  <script src="app.js" type="module" defer></script>
15 </head>
16 <body>
17   <ion-app>
18     <ion-header>
19       <ion-toolbar color="primary">
20         <ion-title> Ionic-Firebase Example </ion-title>
21       </ion-toolbar>
22     </ion-header>
23     <ion-content>
24       <ion-item>
25
26       </ion-item>
27       <ion-item>
28         <ion-button id="btn-send">Send to Firebase</ion-button>
29       </ion-item>
30       <ion-item>
31         <ion-button id="btn-get">Get from Firebase</ion-button>
32       </ion-item>
33     </ion-content>
34   </ion-app>
35 </body>
36
37
38 </html>
39
```

# Setting Up Firebase

- Navigate to the Firebase website. You will need a Google account to log in.
- Click on "Add Project" and give it a suitable name. Press continue.
- Do not turn on the analytics. Press continue.
- Press Realtime Database and create it (Choose US location).
- For our purpose, we can start in test mode.
- Choose a rule set which allows read and write (for this example)

# Linking to a Project

In the Firebase project dashboard, add firebase to the app by clicking on the link and then registering the name of the app.

Get started by adding  
Firebase to your app



Add an app to get started

## Add Firebase to your web app

### 1 Register app

App nickname ?

☐ Also set up **Firebase Hosting** for this app. [Learn more](#)

Hosting can also be set up later. There is no cost to get started at any time.

Register app

### 2 Add Firebase SDK

# Adding Firebase

Use the `<script>` tag option to add the SDK and copy the code and place it in the `app.js` file

## 2 Add Firebase SDK

☐ Use npm ? ☒ Use a `<script>` tag ?

Copy and paste these scripts into the bottom of your `<body>` tag, but before you use any Firebase services:

```
<script type="module">
  // Import the functions you need from the SDKs you need
  import { initializeApp } from "https://www.gstatic.com/firebasejs/9.6.10/firebase-app.js";
  // TODO: Add SDKs for Firebase products that you want to use
  // https://firebase.google.com/docs/web/setup#available-libraries

  // Your web app's Firebase configuration
  const firebaseConfig = {
    apiKey: "AIzaSyDDADlPEzT0vB71jJA7Vc3-jDH2lvUc8jQ",
    authDomain: "mytestproject2-e3a02.firebaseio.com",
    databaseURL: "https://mytestproject2-e3a02-default-rtdb.firebaseio.com",
    projectId: "mytestproject2-e3a02",
    storageBucket: "mytestproject2-e3a02.appspot.com",
    messagingSenderId: "596587043361",
    appId: "1:596587043361:web:fad382ef6768d1097ae160"
  };

  // Initialize Firebase
  const app = initializeApp(firebaseConfig);
</script>
```





# Data File

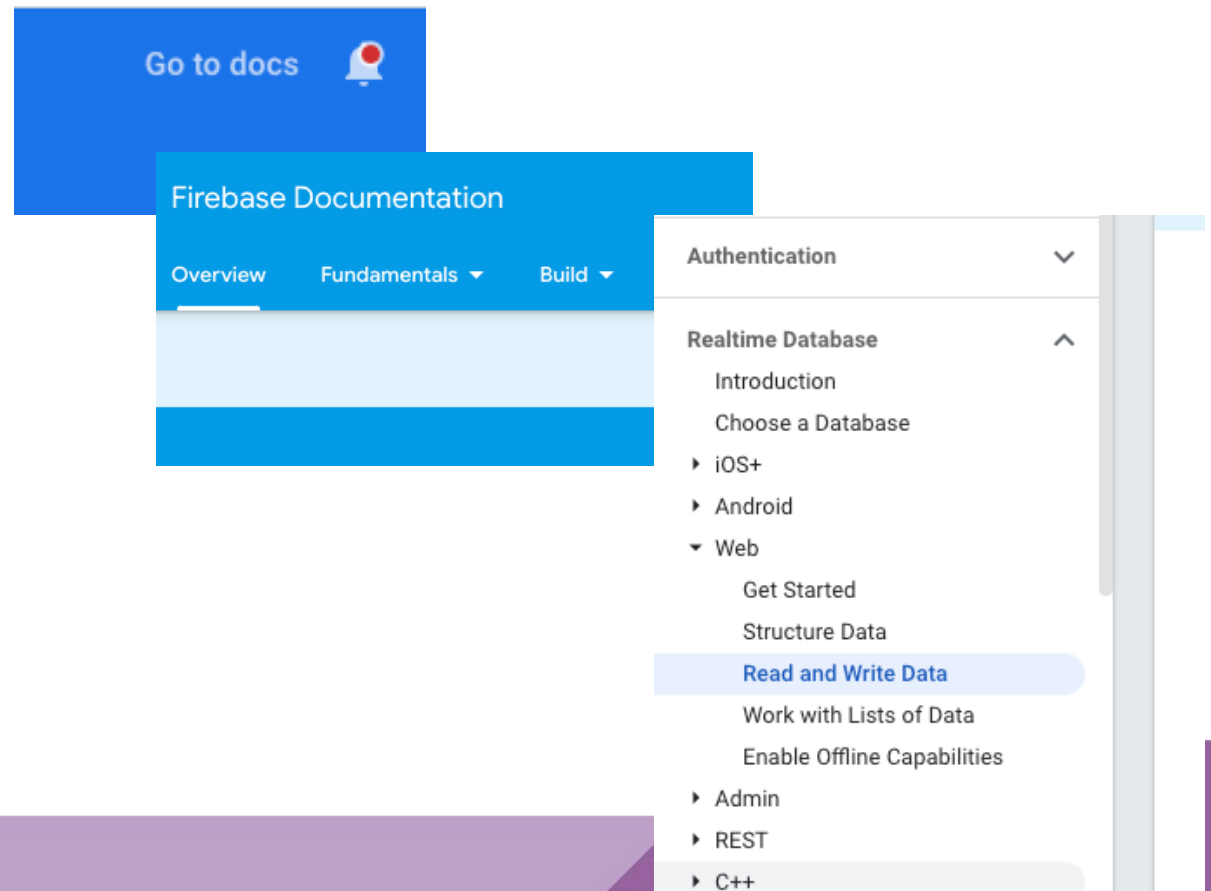
- Create a data.js file which will hold an array of objects. Make sure that the reference to this file in index.html is above the reference to the app.js file.

```
1 let dataObjectArray = [  
2   {  
3     id: '1',  
4     title: 'Bear',  
5     avatar: './Animals/bear.png',  
6     sound: 'roar',  
7     image: './Pictures/bear.jpg'  
8   },  
9   {  
10    id: '2',  
11    title: 'Dog',  
12    avatar: './Animals/dog.png',  
13    sound: 'woof',  
14    image: './Pictures/dog.jpg'  
15  },  
16  {  
17    id: '3',  
18    title: 'Cat',  
19    avatar: './Animals/cat.png',  
20    sound: 'meow',  
21    image: './Pictures/cat.jpg'  
22  },  
23  {  
24    id: '4',  
25    title: 'Pig',  
26    avatar: './Animals/pig.png',  
27    sound: 'oink',  
28    image: './Pictures/pig.jpg'  
29  },  
30  {  
31    id: '5',  
32    title: 'Snake',  
33    avatar: './Animals/snake.png',  
34    sound: 'hiss',  
35    image: './Pictures/snake.jpg'  
36  }  
37 ];
```

# Adding further functionality

In the Firebase console, click on the "Go to docs" link and then the Build tab. Then go to the Realtime Database link in the drop-down menu.

Now choose Web and "Read and Write Data" to get to the code that will allow you to read and write to the database.



# Getting a database reference

We need to create the database reference in the app.js file. The import statement can be put under the existing import statement and the url of the library can be changed to match the existing reference but with "app" changed to "database".

## Get a database reference

To read or write data from the database, you need an instance of `firebase.database.Reference` :

[Web version 9](#)  
(modular)

Web version 8  
(namespaced)

★ [Learn more](#) about the tree-shakeable Web v9 modular SDK and [upgrade](#) from version 8.

```
import { getDatabase } from "firebase/database";  
  
const database = getDatabase();
```

[rtbd\\_get\\_reference.js](#)

# app.js

We also need to import `ref` and `set` as well as the `getDatabase` function.

```
import { getDatabase, ref, set } from "firebase/database";

function writeUserData(userId, name, email, imageUrl) {
  const db = getDatabase();
  set(ref(db, 'users/' + userId), {
    username: name,
    email: email,
    profile_picture : imageUrl
  });
}
```

rtdb\_write\_new\_user.js

```
import {getDatabase, ref, set}
from "https://www.gstatic.com/firebasejs/9.6.9/firebase-database.js";
```

# Completing the App

We can set up the references for the ionic components.

```
const db = getDatabase();  
//const dbRef = ref(db);  
  
const textInput = document.getElementById("input-txt");  
const sendButton = document.getElementById("btn-send");  
const getButton = document.getElementById("btn-get");  
  
sendButton.addEventListener('click', sendToFirebase);  
getButton.addEventListener('click', getFromFirebase);
```

# Completing the App

We can use the functions in the documentation to send data to the database.

```
//--Send to Firebase-----  
function sendToFirebase(){  
    for (let obj of dataObjectArray){  
        set(ref(db, "recordNo" + obj.id), obj)  
        .then(logSuccess)  
        .catch(logError);  
    }  
}  
  
function logSuccess(){  
    console.log("Data stored successfully");  
}  
  
function logError(error){  
    console.log("Unsuccessful " + error);  
}
```

# Completing the App

We can also use the functions in the documentation to retrieve data from the database.

Note that we also need to include any function we use in this code in the import statement from `firebase-database.js`

```
//--Get from Firebase-----  
function getFromFirebase(){  
  const dbRef = ref(db);  
  for (let i = 1; i <= 5; i++){  
    get(child(dbRef, "recordNo" + i))  
      .then(getData).catch(errData);  
  }  
}  
  
function getData(data){  
  //console.log(data.val());  
  let animalObj = data.val();  
  let keys = Object.keys(animalObj);  
  //console.log(keys)  
  // for (let i = 0; i < keys.length; i++){  
  //   let k = keys[i];  
  console.log(animalObj.title + ", " + animalObj.sound);  
  // }  
}  
  
function errData(err){  
  console.log("Error is " + err);  
}
```

```
import { getDatabase, ref, get, set, child, update, remove } from  
"https://www.gstatic.com/firebasejs/9.6.9/firebase-database.js";
```