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Experiment No: 7

AIM: To connect Flutter UI with Firebase realtime database

THEORY: Firebase Database is a cloud-based database that stores data within a JSON structure. Flutter with Firebase is now officially named FlutterFire. All devices connected with Firebase Realtime Database whether it is a mobile device or website automatically receive updates from Firebase with the newest data. You don't need to call any external services to get data from the firebase realtime database in flutter. It is necessary to include the *firebase_core* as well as the *firebase_database* plugins to the Flutter project.

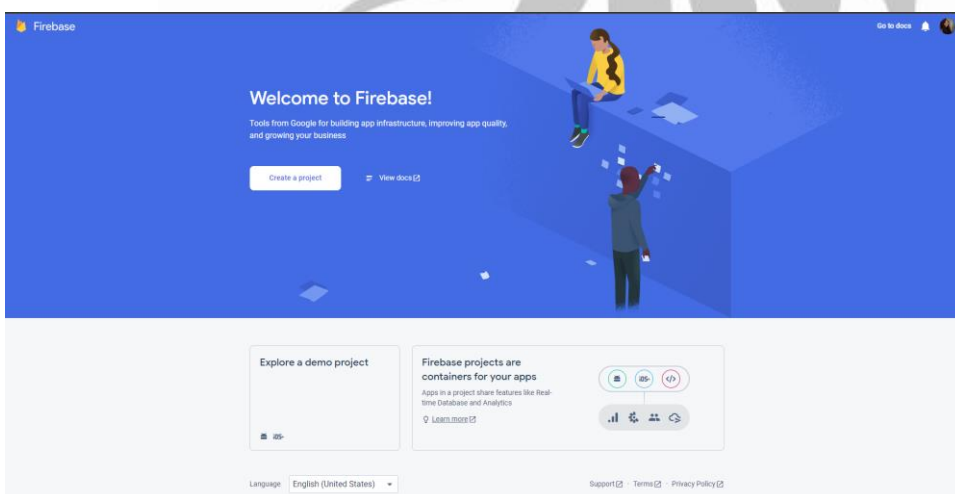
Flutter is a cross-platform development framework. So Flutter 2 now officially releases the stable version of flutter web. Same like flutter App, to read data from realtime database in flutter web, no need to add extra code. The same code base will be executed on the flutter web as well. All you need to do is just add two JS scripts on the index.html file inside the web folder.

Note – Firebase real-time databases and Firebase Firestore are distinct things. Firebase Real-Time Database stores every information in a single large JSON file. However, Firestore is an array made up of many JSON files known as *collections*.

Creating a Firebase Account

In order to use a Firestore database, you need a Firebase account. Go to <https://firebase.google.com/> and sign up for an account.

On the Welcome to Firebase page, click the **Create a project** button. If Firebase shows a different page, you can click **Go to console** in the top right corner and then click **Add project**.



Now, enter the project name: **first** and click the **Continue** button.

× Create a project (Step 1 of 3)


Let's start with a name for your project[®]

Project name
firstPrj

☒ I accept the [Firebase terms](#)

☒ I confirm that I will use Firebase exclusively for purposes relating to my trade, business, craft, or profession.

[Continue](#)



On the next page, toggle the switch for **Enable Google Analytics** to the **off** position. You won't use analytics for this project. Then, click **Create project**.

× Create a project (Step 2 of 3)

Google Analytics for your Firebase project


Google Analytics is a free and unlimited analytics solution that enables targeting, reporting, and more in Firebase Crashlytics, Cloud Messaging, In-App Messaging, Remote Config, A/B Testing, and Cloud Functions.

Google Analytics enables:

- ☒ A/B testing
- ☒ Crash-free users
- ☒ User segmentation & targeting across Firebase products
- ☒ Event-based Cloud Functions triggers
- ☒ Free unlimited reporting

☒ **Enable Google Analytics for this project**
Recommended

[Previous](#) [Continue](#)



× Create a project (Step 3 of 3)

Configure Google Analytics

Analytics location: **India**

Google Analytics is a business tool. Use it exclusively for purposes related to your trade, business, craft, or profession.

Data sharing settings and Google Analytics terms:


☒ Use the default settings for sharing Google Analytics data. [Learn more](#)

- ☒ Share your Analytics data with Google to improve Google Products and Services
- ☒ Share your Analytics data with Google to enable Benchmarking
- ☒ Share your Analytics data with Google to enable Technical Support
- ☒ Share your Analytics data with Google Account Specialists

☒ I accept the [Google Analytics terms](#)

Upon project creation, a new Google Analytics property will be created and linked to your Firebase project. This link will enable data flow between the products. Data exported from your Google Analytics property into Firebase is subject to the Firebase terms of service, while Firebase data imported into Google Analytics is subject to the Google Analytics terms of service. [Learn more](#)

[Previous](#) [Create project](#)

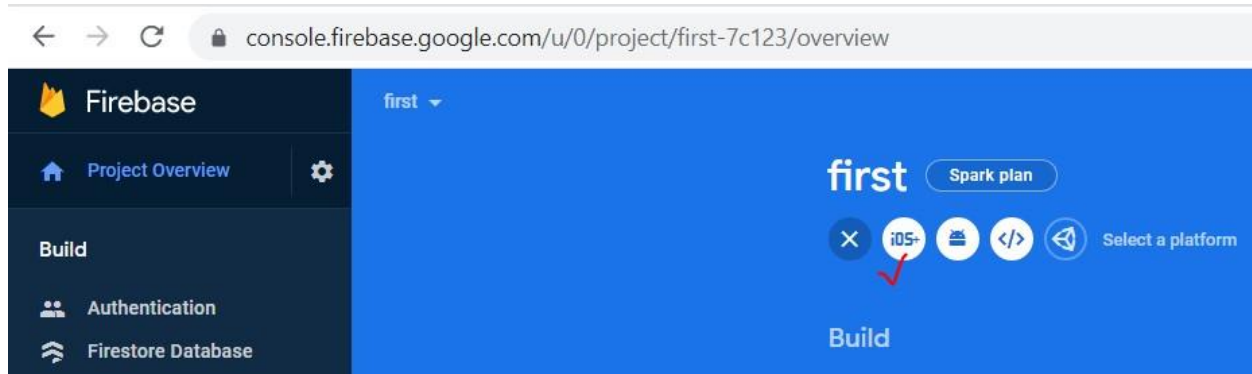


You'll see a few progress dialogs as Firebase allocates resources to your new project

Once your project is ready, click **Continue** to move to the page where you'll add Firebase to both your iOS and Android apps. Start with the iOS app.

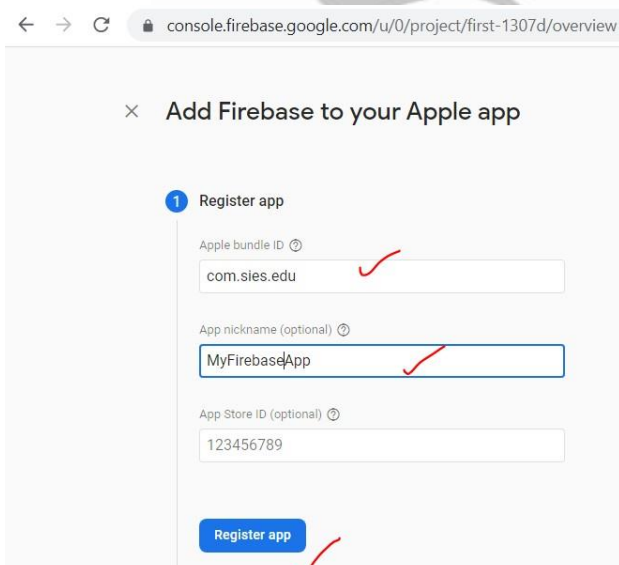
Registering an iOS App

To register the iOS app, click the iOS circle:

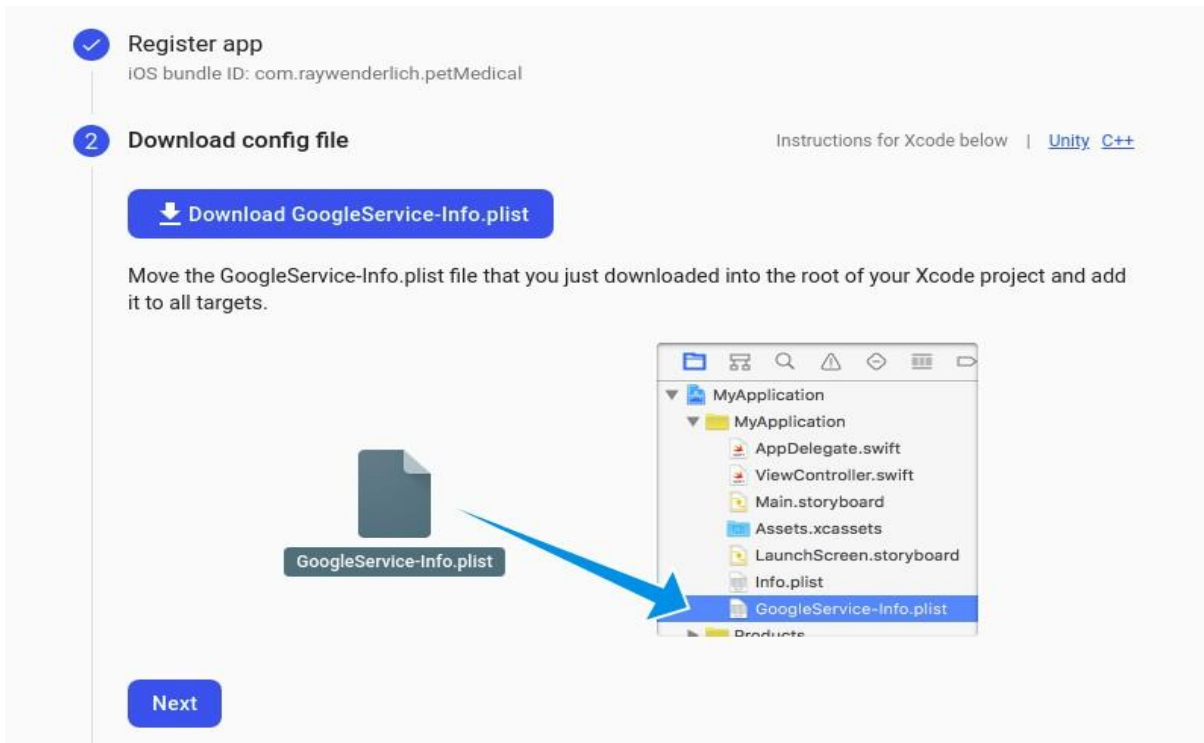


You'll see a dialog to register your app. Enter **com.sies.edu** for the iOS bundle ID and click the **Register app** button.

Note: If you created the Flutter app from scratch enter the bundle ID you used to create the app.

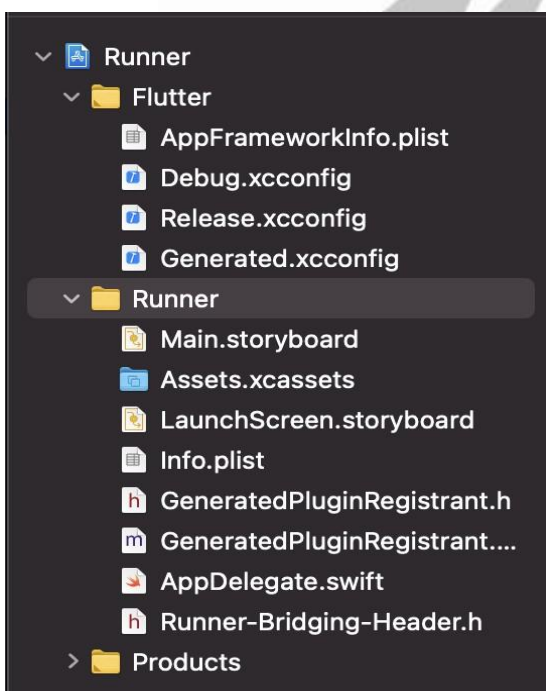


Next, click the **Download GoogleService-Info.plist** button.



Now, move this file into the **iOS > Runner** folder. If using Android Studio, go to **Tools > Flutter** menu, choose **Open iOS module in Xcode**. In Xcode, right-click the **Runner** folder and choose **Add files to Runner....**

Next, add **GoogleService-Info.plist**:



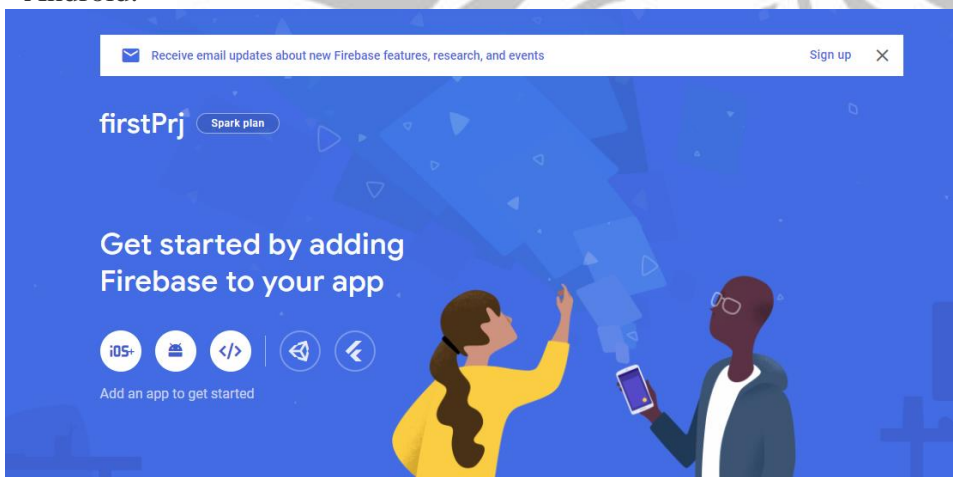
```
> OUTLINE
FIREBASE2_DEMO
  firebaseapp
    .dart_tool
    .idea
    android
    build
    ios
    Flutter
    node_modules
    Runner
      Assets.xcassets
      Base.lproj
      AppDelegate.swift
      GeneratedPluginRegistrant.h
      GeneratedPluginRegistrant.m
      GoogleService-Info.plist
      Info.plist
      Runner-Bridging-Header.h
      Runner.xcodeproj
      Runner.xcworkspace
      .gitignore
      package-lock.json
      package.json
    lib
      generated_plugin_registrant.dart
      main.dart
      realtime_db.dart
    test
      widget_test.dart
    web
    flutter_plugins

firebaseapp > ios > Runner > GoogleService-Info.plist
1  <?xml version="1.0" encoding="UTF-8"?>
2  <!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
3  <plist version="1.0">
4  <dict>
5      <key>CLIENT_ID</key>
6      <string>310248865936-151235ihtir8fs0ka9g3i0illsokltuv.apps.googleusercontent.com</string>
7      <key>REVERSED_CLIENT_ID</key>
8      <string>com.googleusercontent.apps.310248865936-151235ihtir8fs0ka9g3i0illsokltuv</string>
9      <key>API_KEY</key>
10     <string>AIzaSyDLuNhAZleH0s7MI7kES-KmxoUYCx00GZU</string>
11     <key>GCM_SENDER_ID</key>
12     <string>310248865936</string>
13     <key>PLIST_VERSION</key>
14     <string>1</string>
15     <key>BUNDLE_ID</key>
16     <string>com.sies.edu</string>
17     <key>PROJECT_ID</key>
18     <string>first-7c123</string>
19     <key>STORAGE_BUCKET</key>
20     <string>first-7c123.appspot.com</string>
21     <key>IS_ADS_ENABLED</key>
22     <false></false>
23     <key>IS_ANALYTICS_ENABLED</key>
24     <false></false>
25     <key>IS_APPINVOKE_ENABLED</key>
26     <true></true>
27     <key>IS_GCM_ENABLED</key>
28     <true></true>
29     <key>IS_SIGNIN_ENABLED</key>
30     <true></true>
31     <key>GOOGLE_APP_ID</key>
32     <string>1:310248865936:ios:80d76e49cc30875c235815</string>
33     <key>DATABASE_URL</key>
34     <string>https://first-7c123.firebaseio.com</string>
35  </dict>
36  </plist>
```

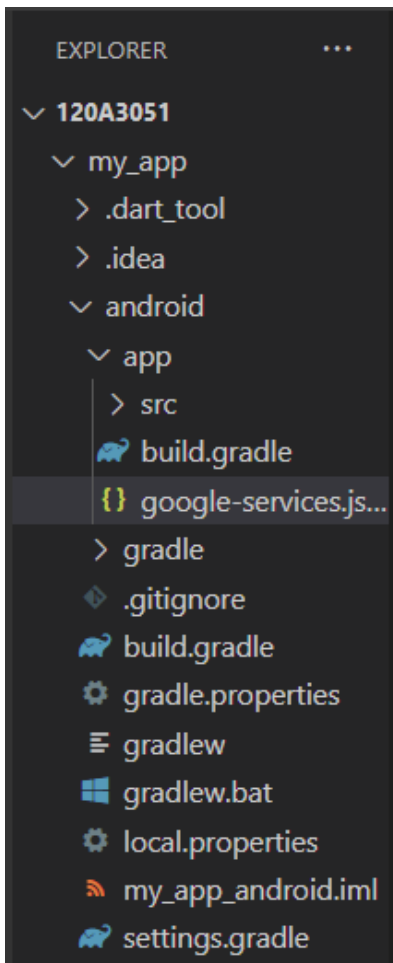
Nice job! Now it's time to register the Android app.

Registering an Android App

First, go back to the Firebase page. Click the **Android** circle to start the process of adding Firebase to Android.

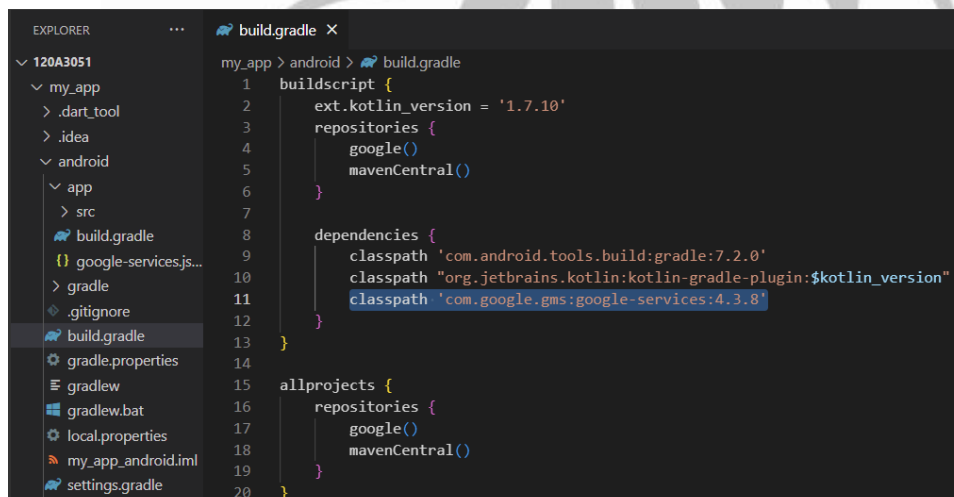


You'll see a dialog to register your app. Enter **com.sies.edu** in the Android package name field. Next, click **Register app**:



Now, open **android/build.gradle**. Then, add the following dependency after the last classpath entry:

```
classpath 'com.google.gms:google-services:4.3.8'
```

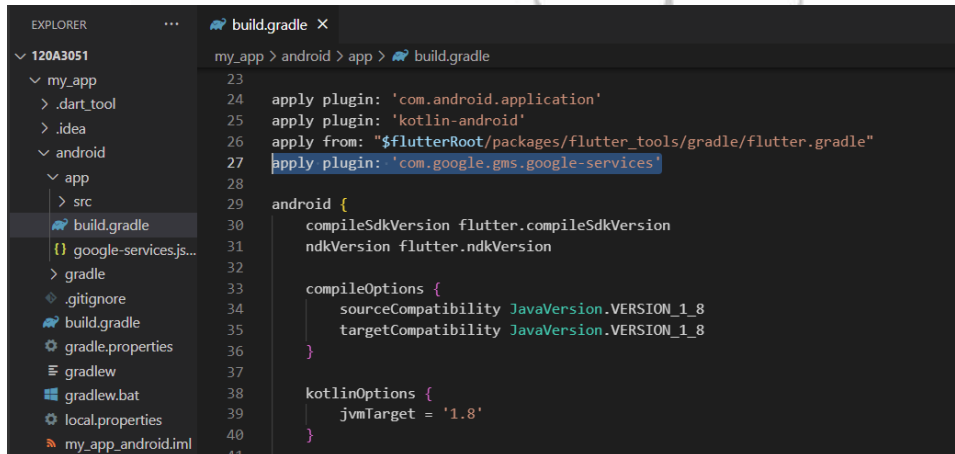


Then, open **android/app/build.gradle** and add the following plugin after the 'apply from' entry:

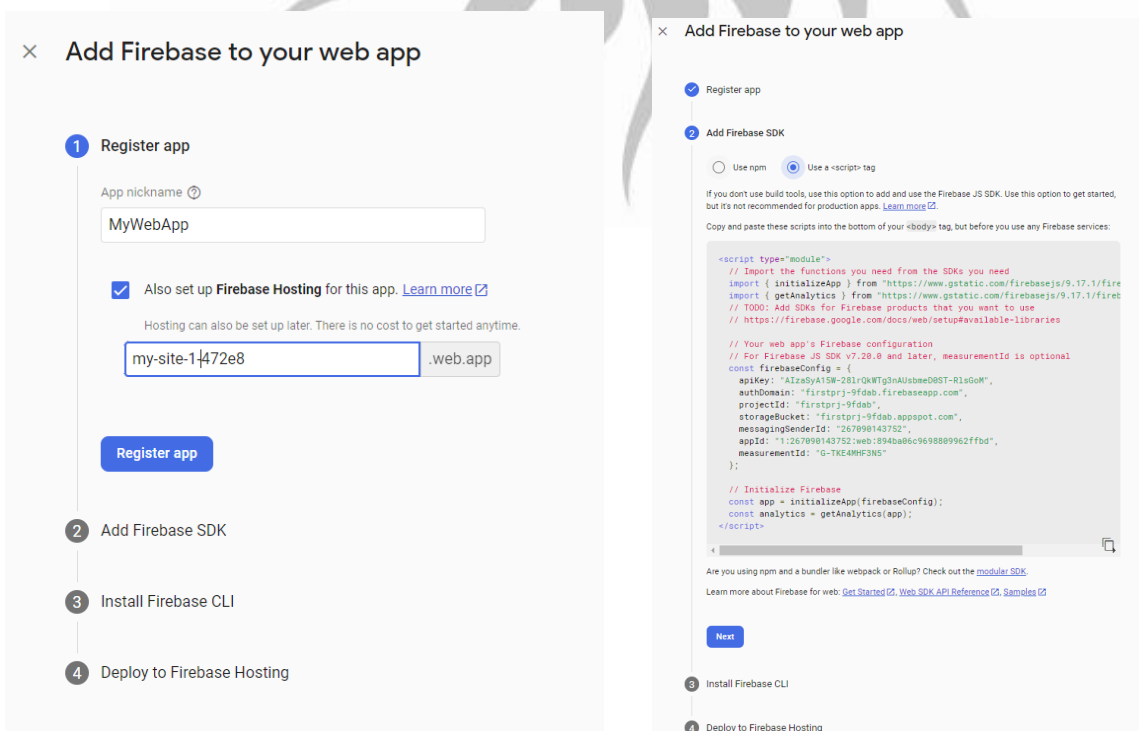
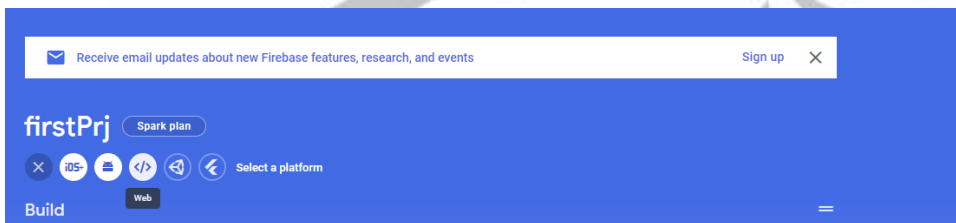
```
apply plugin: 'com.google.gms.google-services'
```

```
apply plugin: 'com.android.application'
apply plugin: 'kotlin-android'
apply from: "$flutterRoot/packages/flutter_tools/gradle/flutter.gradle"
apply plugin: 'com.google.gms.google-services'
```

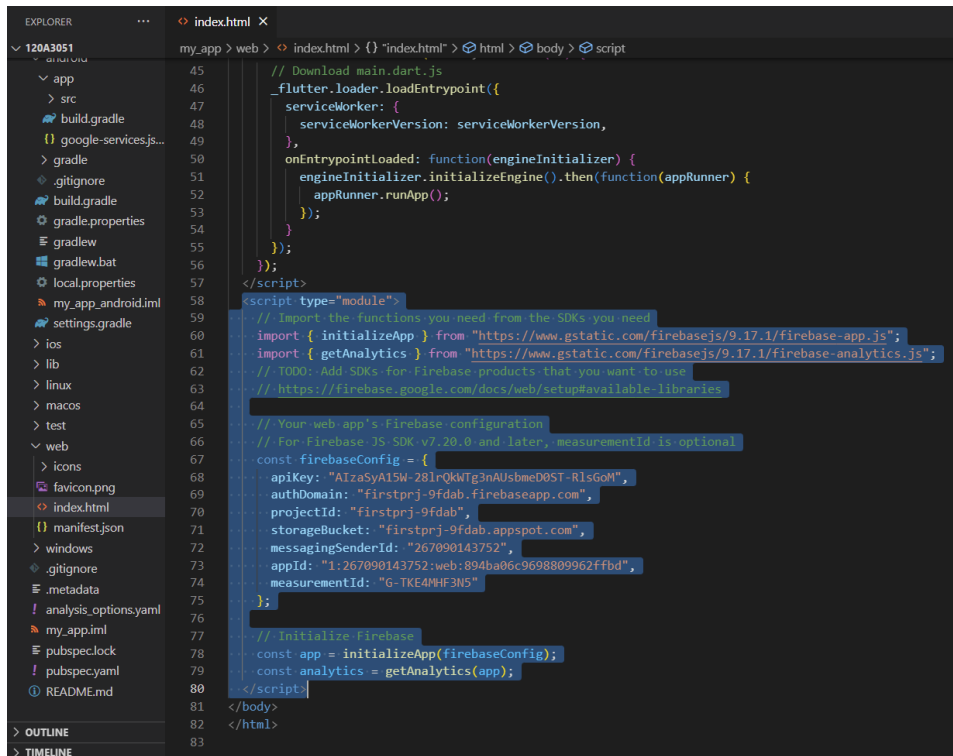
```
android {
    compileSdkVersion 30
```



Registering on Web: In the web section, copy the firebaseConfig details



And paste it inside the index.html using <script> tag as shown below:



```

EXPLORER
120A3051
  android
    app
      src
        build.gradle
        google-services.js...
        gradle
        .gitignore
        build.gradle
        gradle.properties
        gradlew
        gradlew.bat
        local.properties
        my_app_android.iml
        settings.gradle
    ios
    lib
    linux
    macos
    test
    web
      icons
      favicon.png
      index.html
      manifest.json
    windows
    .gitignore
    .metadata
    analysis_options.yaml
    my_app.iml
    pubspec.lock
    pubspec.yaml
    README.md
  OUTLINE
  TIMELINE

my_app > web > index.html > {} "index.html" > html > body > script
45 // Download main.dart.js
46 flutter.loader.loadEntrypoint({
47   serviceWorker: {
48     serviceWorkerVersion: serviceWorkerVersion,
49   },
50   onEntrypointLoaded: function(engineInitializer) {
51     engineInitializer.initializeEngine().then(function(appRunner) {
52       appRunner.runApp();
53     });
54   });
55 });
56 });
57 </script>
58 <script type="module">
59   // Import the functions you need from the SDKs you need
60   import { initializeApp } from "https://www.gstatic.com/firebasejs/9.17.1/firebase-app.js";
61   import { getAnalytics } from "https://www.gstatic.com/firebasejs/9.17.1/firebase-analytics.js";
62   // TODO: Add SDKs for Firebase products that you want to use
63   // https://firebase.google.com/docs/web/setup#available-libraries
64
65   // Your web app's Firebase configuration
66   // For Firebase JS SDK v7.20.0 and later, measurementId is optional
67   const firebaseConfig = {
68     apiKey: "AIzaSyA15W-28InQKWTg3nAUSbmeD0ST-RlSGoM",
69     authDomain: "firstprj-9fdab.firebaseio.com",
70     projectId: "firstprj-9fdab",
71     storageBucket: "firstprj-9fdab.appspot.com",
72     messagingSenderId: "267090143752",
73     appId: "1:267090143752:web:894ba06c9698809962ffbd",
74     measurementId: "G-TKE4MHF3N5"
75   };
76
77   // Initialize Firebase
78   const app = initializeApp(firebaseConfig);
79   const analytics = getAnalytics(app);
80 </script>
81 </body>
82 </html>
83

```

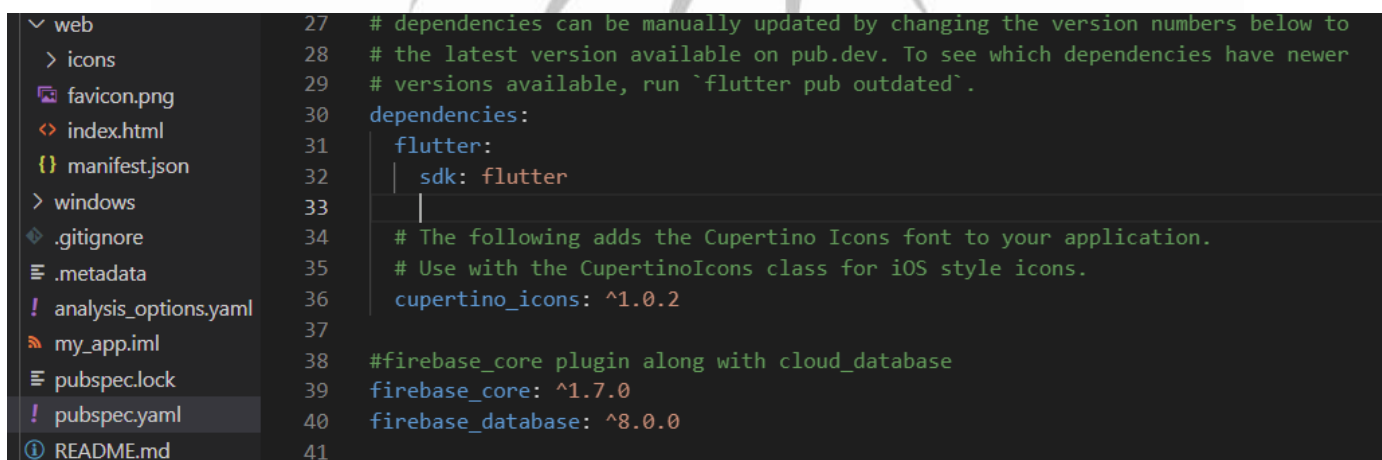
Initializing Firebase App

Before you use Firebase services, you'll need to initialize your Firebase App. To do this, you'll need to add the **firebase_core** plugin along with **cloud_database**.

Open the **pubspec.yaml** file in your project and add the following dependencies, then click Pub get:

firebase_core: ^1.7.0

firebase_database: ^8.0.0



```

web
  icons
  favicon.png
  index.html
  manifest.json
  windows
  .gitignore
  .metadata
  analysis_options.yaml
  my_app.iml
  pubspec.lock
  pubspec.yaml
  README.md

27 # dependencies can be manually updated by changing the version numbers below to
28 # the latest version available on pub.dev. To see which dependencies have newer
29 # versions available, run `flutter pub outdated`.
30 dependencies:
31   flutter:
32     sdk: flutter
33
34   # The following adds the Cupertino Icons font to your application.
35   # Use with the CupertinoIcons class for iOS style icons.
36   cupertino_icons: ^1.0.2
37
38   #firebase_core plugin along with cloud_database
39   firebase_core: ^1.7.0
40   firebase_database: ^8.0.0
41

```

× Add Firebase to your web app

- ✓ Register app
- ✓ Add Firebase SDK
- 3 Install Firebase CLI

To host your site with Firebase Hosting, you need the Firebase CLI (a command line tool).
Run the following [npm](#) command to install the CLI or update to the latest CLI version.

```
$ npm install -g firebase-tools
```

Doesn't work? Take a look at the [Firebase CLI reference](#) or change your [npm permissions](#)

Previous

Next

- 4 Deploy to Firebase Hosting

- ✓ Register app
- ✓ Add Firebase SDK
- ✓ Install Firebase CLI
- 4 Deploy to Firebase Hosting

You can deploy now or [later](#). To deploy now, open a terminal window, then navigate to or create a root directory for your web app.
[Sign in to Google](#)

```
$ firebase login
```

Initiate your project
Run this command from your app's root directory:

```
$ firebase init
```

Specify your site in firebase.json
Add your site ID to the [firebase.json](#) configuration file. After you get set up, see the [best practices for multi-site deployment](#).

```
{  
  "hosting": {  
    "site": "my-site-1-472e8",  
    "public": "public",  
    ...  
  }  
}
```

When you're ready, deploy your web app
Put your static files (e.g., HTML, CSS, JS) in your app's deploy directory (the default is "public").
Then, run this command from your app's root directory:

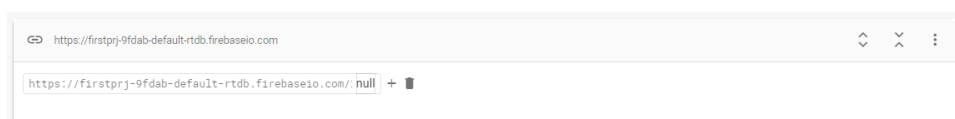
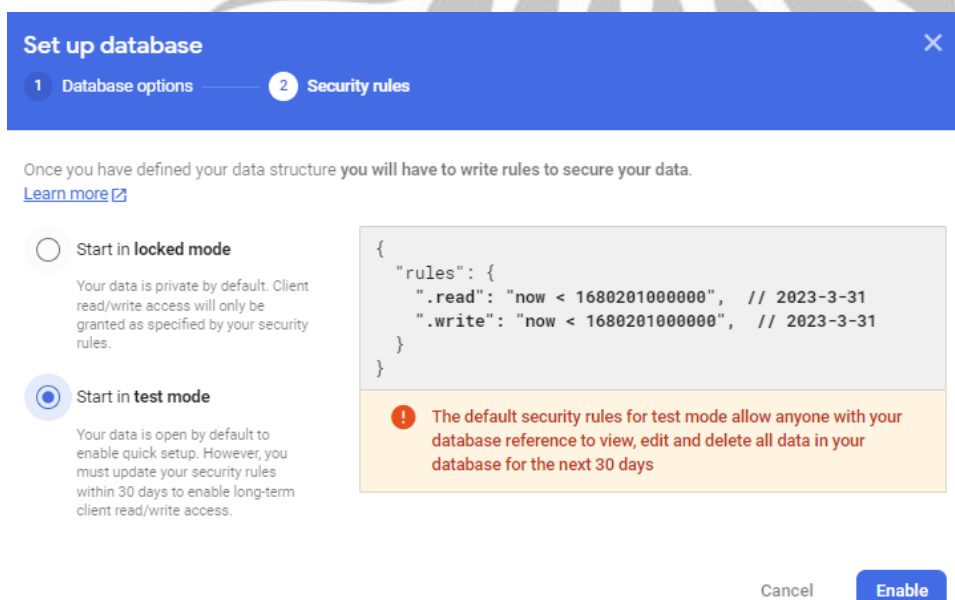
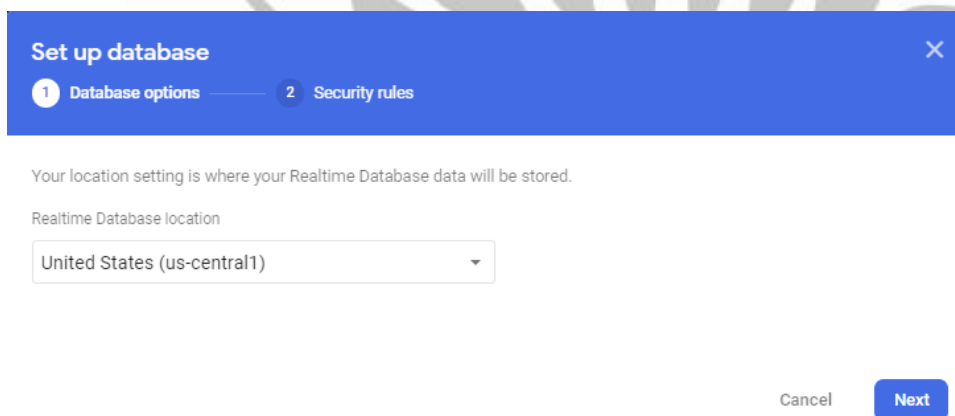
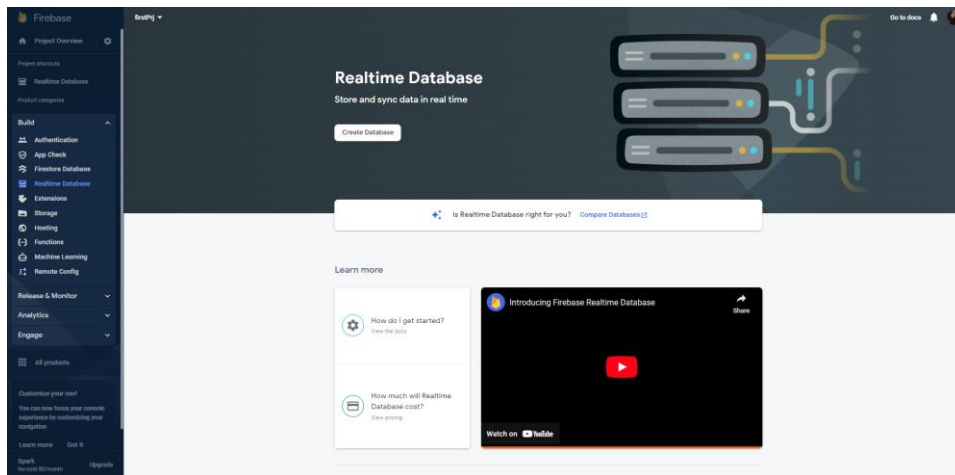
```
$ firebase deploy --only hosting:my-site-1-472e8
```

After deploying, view your app at [my-site-1-472e8.web.app](#)
Need help? Check out the [Hosting docs](#)

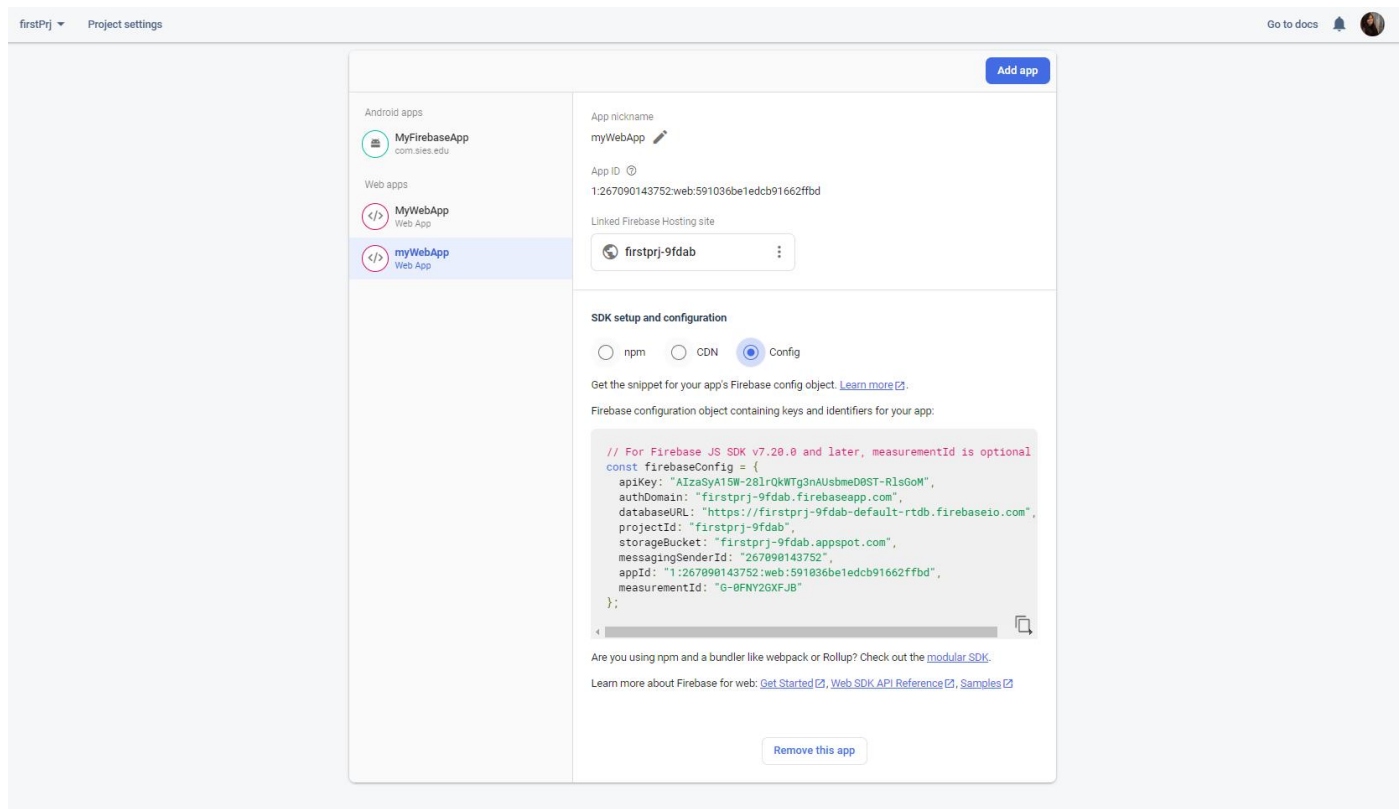
Previous

Continue to console

Firestore project setup:



Go to your Firebase Project Settings and copy the **config code** to be added into your flutter app ie. main.dart



Your **main.dart** should have the following code:

```
main.dart X
lib > main.dart > ...
1 import 'package:flutter/material.dart';
2 import 'package:firebase_core/firebase_core.dart';
3 //import 'package:firebaseapp/firebaseapp.dart';
4
Run | Debug | Profile
5 Future<void> main() async {
6   WidgetsFlutterBinding.ensureInitialized();
7   // For Firebase JS SDK v7.20.0 and later, measurementId is optional
8   FirebaseApp firebaseApp = await Firebase.initializeApp(
9     options: const FirebaseOptions(
10       apiKey: "AIzaSyA15W-28lrQkWTg3nAUsbmeD0ST-RlsGoM",
11       authDomain: "firstprj-9fdab.firebaseio.com",
12       databaseURL: "https://firstprj-9fdab-default-rtdb.firebaseio.com",
13       projectId: "firstprj-9fdab",
14       storageBucket: "firstprj-9fdab.appspot.com",
15       messagingSenderId: "267090143752",
16       appId: "1:267090143752:web:591036be1edcb91662ffbd",
17       measurementId: "G-0FNY2GXFJB"),
18   );
19   // runApp(const MaterialApp(
20   //   home: realtime_db(),
21   // ));
22 }
23
```

Create an another file as **realtime_db.dart** inside your project and write the following code as shown:

```
lib > realtime_db.dart > ...
1 import 'package:firebase_database/firebase_database.dart';
2 import 'package:flutter/cupertino.dart';
3 import 'package:flutter/material.dart';
4
5 class realtime_db extends StatefulWidget {
6   const realtime_db({super.key});
7
8   @override
9   State<realtime_db> createState() => _realtime_dbState();
10 }
11
12 class _realtime_dbState extends State<realtime_db> {
13   late DatabaseReference _dbref;
14   String databasejson = "";
15   @override
16   void initState() {
17     super.initState();
18     _dbref = FirebaseDatabase.instance.ref();
19   }
20 }
```

```
@override
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(
      title: Text("HELLO"),
    ), // AppBar
    body: SafeArea(
      child: SingleChildScrollView(
        child: Column(
          children: [
            Padding(
              padding: const EdgeInsets.all(8.0),
              child: Text(" database - " + databasejson),
            ), // Padding
            TextButton(
              onPressed: () {
                _createDB();
              },
              child: const Text(
                " create DB",
                style: TextStyle(color: Colors.black),
              ), // Text // TextButton
            ),
          ],
        ), // Column
      ), // SingleChildScrollView
    ), // SafeArea
  ); // Scaffold
}

_createDB() {
  _dbref.child("profile").set(" my profile");
  _dbref
    .child("jobprofile")
    .set({'website': "www.siesgst.com", "website2": "www.siesedu.com"});
}
```

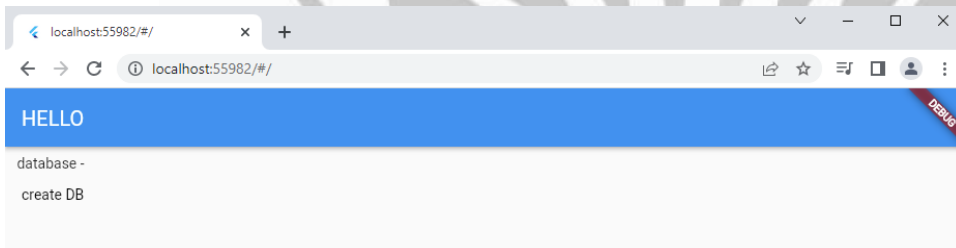
```
PS C:\Users\exam\Desktop\120A3051\my_app> flutter run
Multiple devices found:
Windows (desktop) • windows • windows-x64 • Microsoft Windows [Version 10.0.19045.2486]
Chrome (web) • chrome • web-javascript • Google Chrome 110.0.5481.178
Edge (web) • edge • web-javascript • Microsoft Edge 109.0.1518.70
[1]: Windows (windows)
[2]: Chrome (chrome)
[3]: Edge (edge)
Please choose one (or "q" to quit): 2
Launching lib/main.dart on Chrome in debug mode...
Waiting for connection from debug service on Chrome... 12.9s
This app is linked to the debug service: ws://127.0.0.1:56031/QEiSziNBAY=/ws
Debug service listening on ws://127.0.0.1:56031/QEiSziNBAY=/ws


To hot restart changes while running, press "r" or "R".
For a more detailed help message, press "h". To quit, press "q".

A Dart VM Service on Chrome is available at: http://127.0.0.1:56031/QEiSziNBAY=
The Flutter DevTools debugger and profiler on Chrome is available at: http://127.0.0.1:9101?uri=http://127.0.0.1:56031/QEiSziNBAY=
```

 <https://firstprj-9fdab-default-rtdb.firebaseio.com>

`https://firstprj-9fdab-default-rtdb.firebaseio.com/: null`



 <https://firstprj-9fdab-default-rtdb.firebaseio.com>

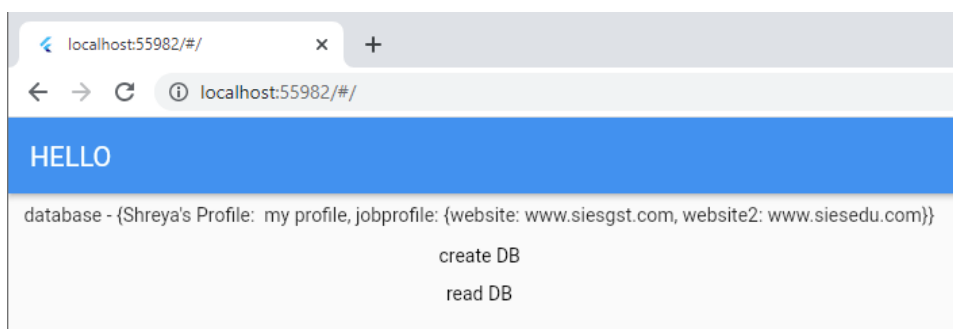
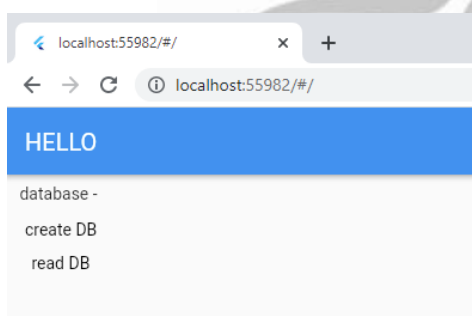
`https://firstprj-9fdab-default-rtdb.firebaseio.com/`

```
├── Shreya's Profile: "my profile"
└── jobprofile
    ├── website: "www.siesgst.com"
    └── website2: "www.siesedu.com"
```


Read all the data at once: Extend the code of **realtime_db.dart** as shown below

```
TextButton(  
  onPressed: () {  
    _createDB();  
  },  
  child: const Text(  
    " create DB",  
    style: TextStyle(color: Colors.black),  
  )), // Text // TextButton  
TextButton(  
  onPressed: () {  
    _readDB();  
  },  
  child: const Text(  
    " read DB",  
    style: TextStyle(color: Colors.black),  
  )), // Text // TextButton
```

```
_readDB() {  
  _dbref.once().then((DatabaseEvent dataSnapshot) {  
    print("read once - " + dataSnapshot.snapshot.value.toString());  
    setState(() {  
      databasejson = dataSnapshot.snapshot.value.toString();  
    });  
  });  
}
```



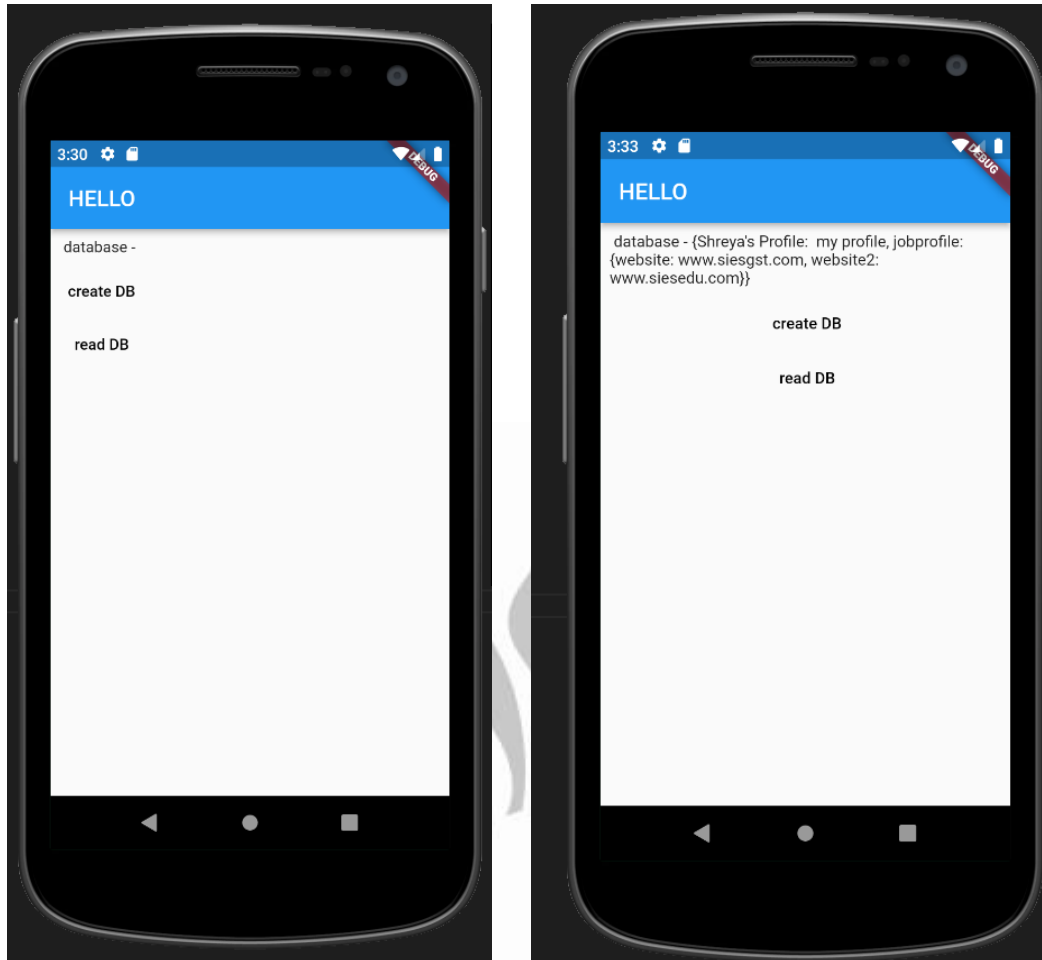
Realtime Database on android emulator:

Android->app->build.gradle

```
defaultConfig {  
    // TODO: Specify your own unique Application ID (https://developer.android.com/studio/build/application-id.html).  
    applicationId "com.sies.edu"  
    // You can update the following values to match your application needs.  
    // For more information, see: https://docs.flutter.dev/deployment/android#reviewing-the-gradle-build-configuration.  
    minSdkVersion 19  
    targetSdkVersion flutter.targetSdkVersion  
    versionCode flutterVersionCode.toInteger()  
    versionName flutterVersionName  
}
```

```
android > app > src > main > AndroidManifest.xml  
1  <manifest xmlns:android="http://schemas.android.com/apk/res/android"  
2      package="com.example.my_app">  
3      <uses-permission android:name="android.permission.INTERNET" />  
4  </manifest>
```

```
main.dart x build.gradle AndroidManifest.xml  
lib > main.dart > main  
1  import 'package:flutter/material.dart';  
2  import 'package:firebase_core/firebase_core.dart';  
3  import './realtime_db.dart';  
4  
Run | Debug | Profile  
5  Future<void> main() async {  
6      WidgetsFlutterBinding.ensureInitialized();  
7      // For Firebase JS SDK v7.20.0 and later, measurementId is optional  
8      FirebaseApp firebaseApp = await Firebase.initializeApp(  
9          name: "my_app",  
10         options: const FirebaseOptions(  
11             apiKey: "AIzaSyA15W-28lrQkWtg3nAUsbmeD0ST-RlsGoM",  
12             authDomain: "firstprj-9fdab.firebaseio.com",  
13             databaseURL: "https://firstprj-9fdab-default-rtdb.firebaseio.com",  
14             projectId: "firstprj-9fdab",  
15             storageBucket: "firstprj-9fdab.appspot.com",  
16             messagingSenderId: "267090143752",  
17             appId: "1:267090143752:web:591036be1edcb91662ffbd",  
18             measurementId: "G-0FNY2GXFJB"),  
19         );  
20         runApp(const MaterialApp(  
21             home: realtime_db(),  
22         )); // MaterialApp  
23     }  
24
```



Conclusion: Successfully connected Flutter UI with Firebase realtime database.