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Batch: E3

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.

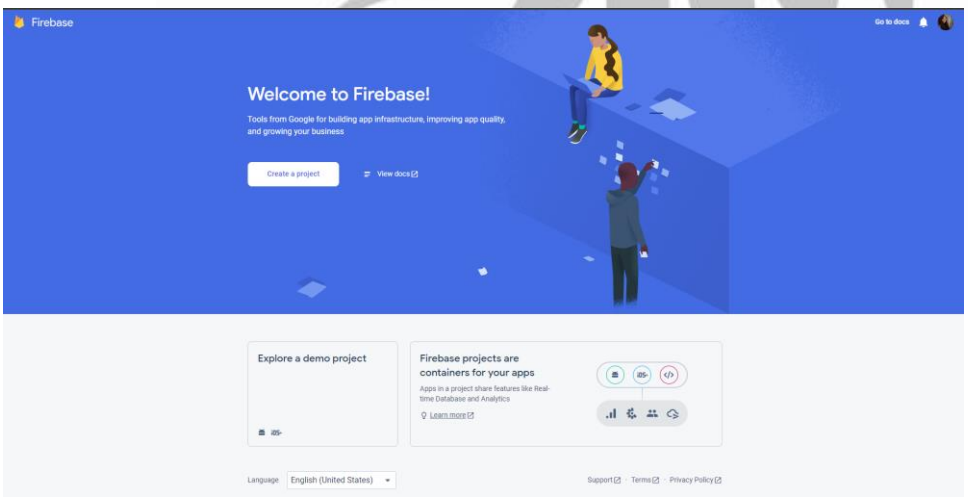
Flutter is a cross-platform development framework. So Flutter 2 now officially releases the stable version of flutter web. Same like flutter App, to read data from realtime database in flutter web, no need to add extra code. The same code base will be executed on the flutter web as well. All you need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

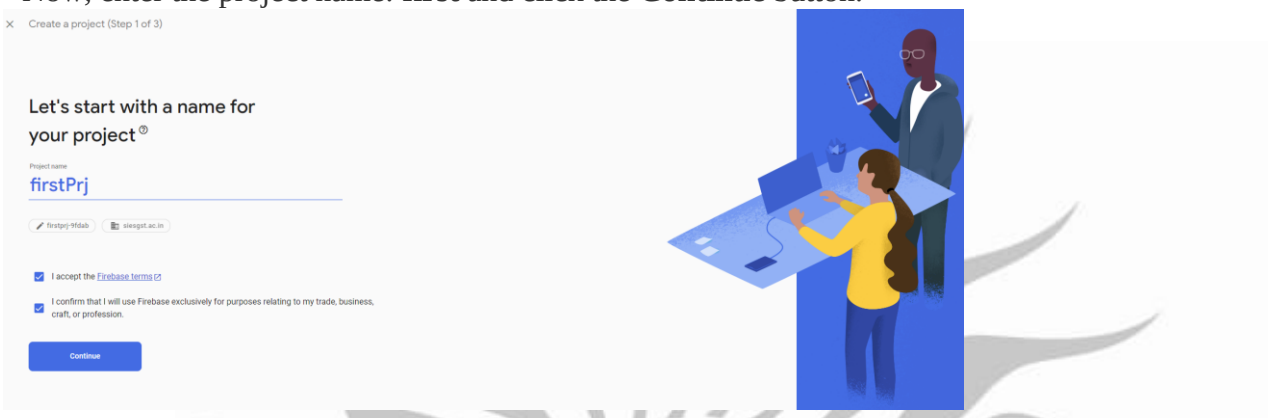
Creating a Firebase Account

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

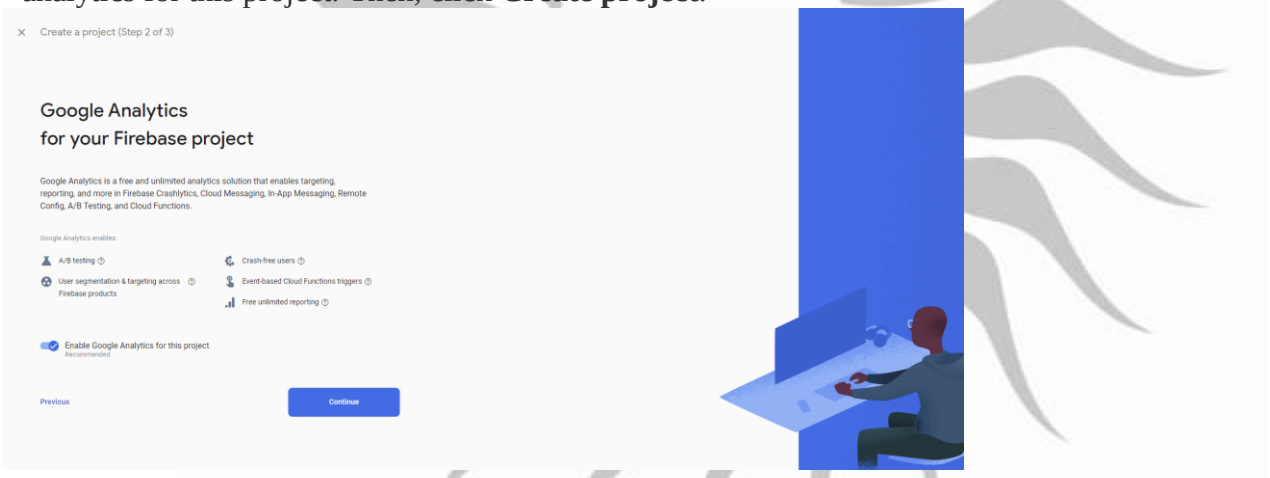
On the Welcome to Firebase page, click the **Create a project** button. If Firebase shows a different page, you can click **Go to console** in the top right corner and then click **Add project**.

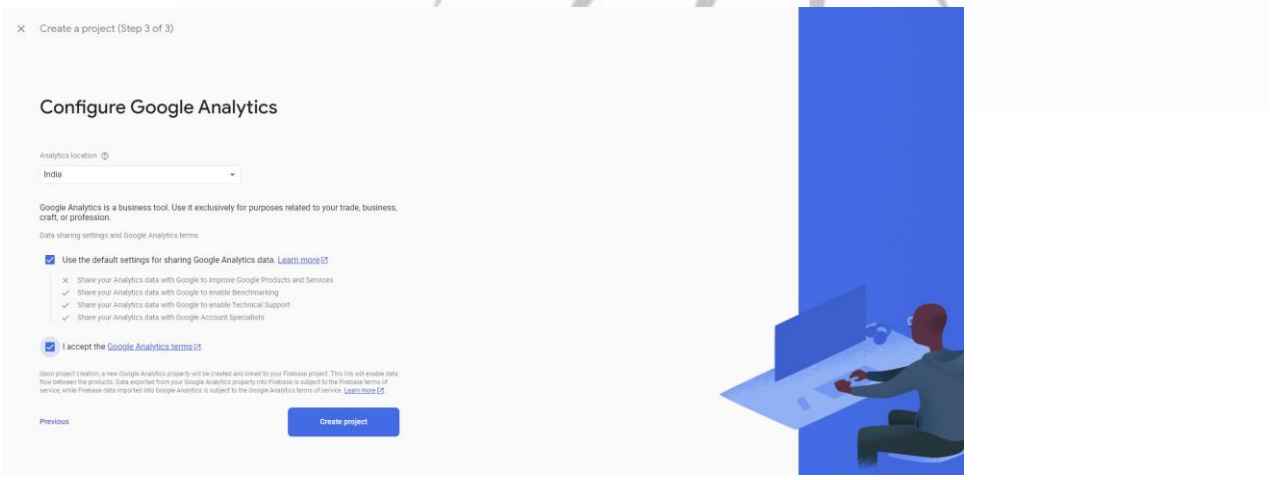


Now, enter the project name: **first** and click the **Continue** button.



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**.





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

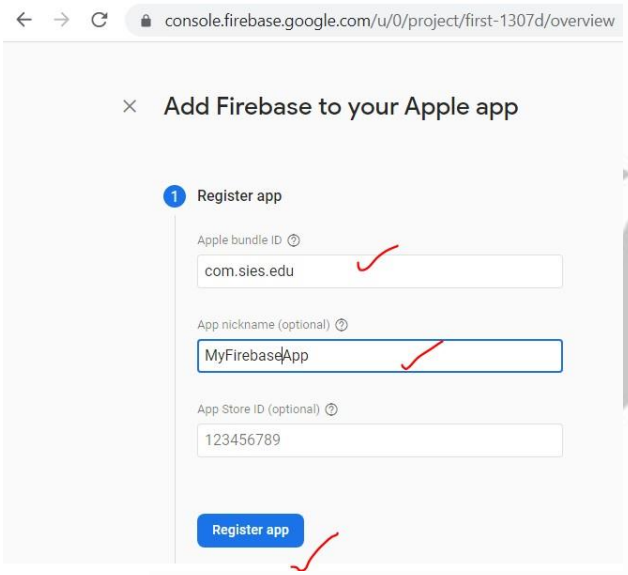
Once your project is ready, click **Continue** to move to the page where you'll add Firebase to both your iOS and Android apps. Start with the iOS app.

Registering an iOS App

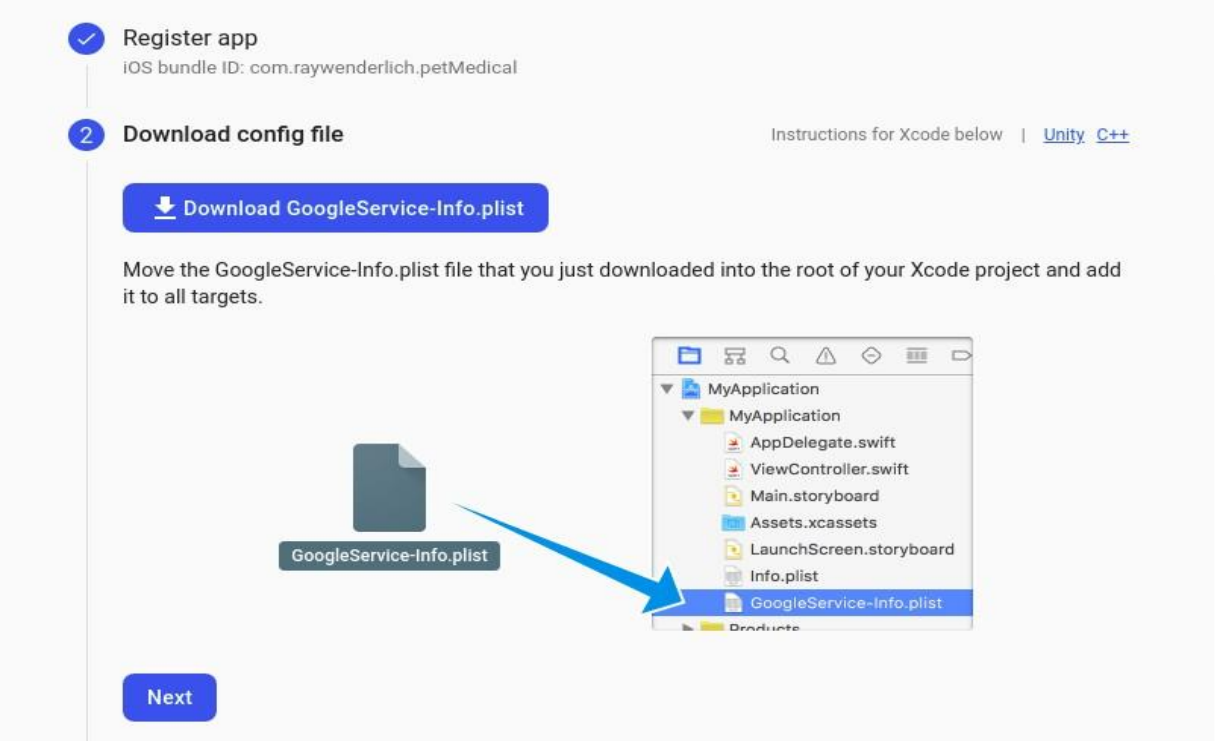
To register the iOS app, click the iOS circle:

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.

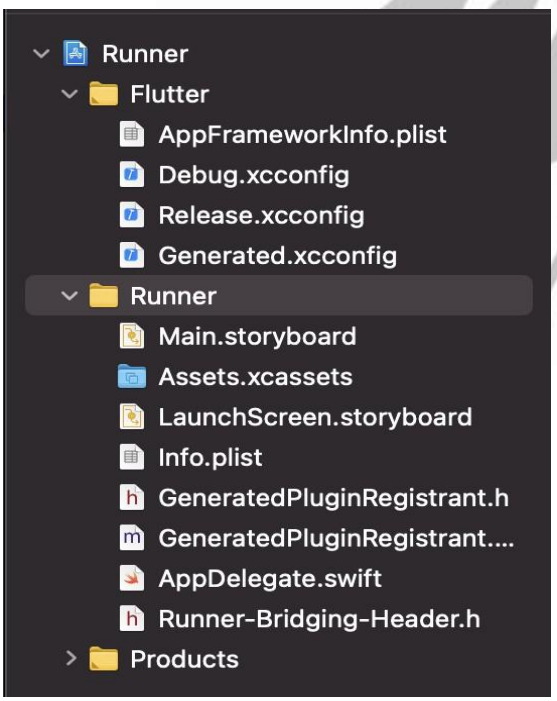


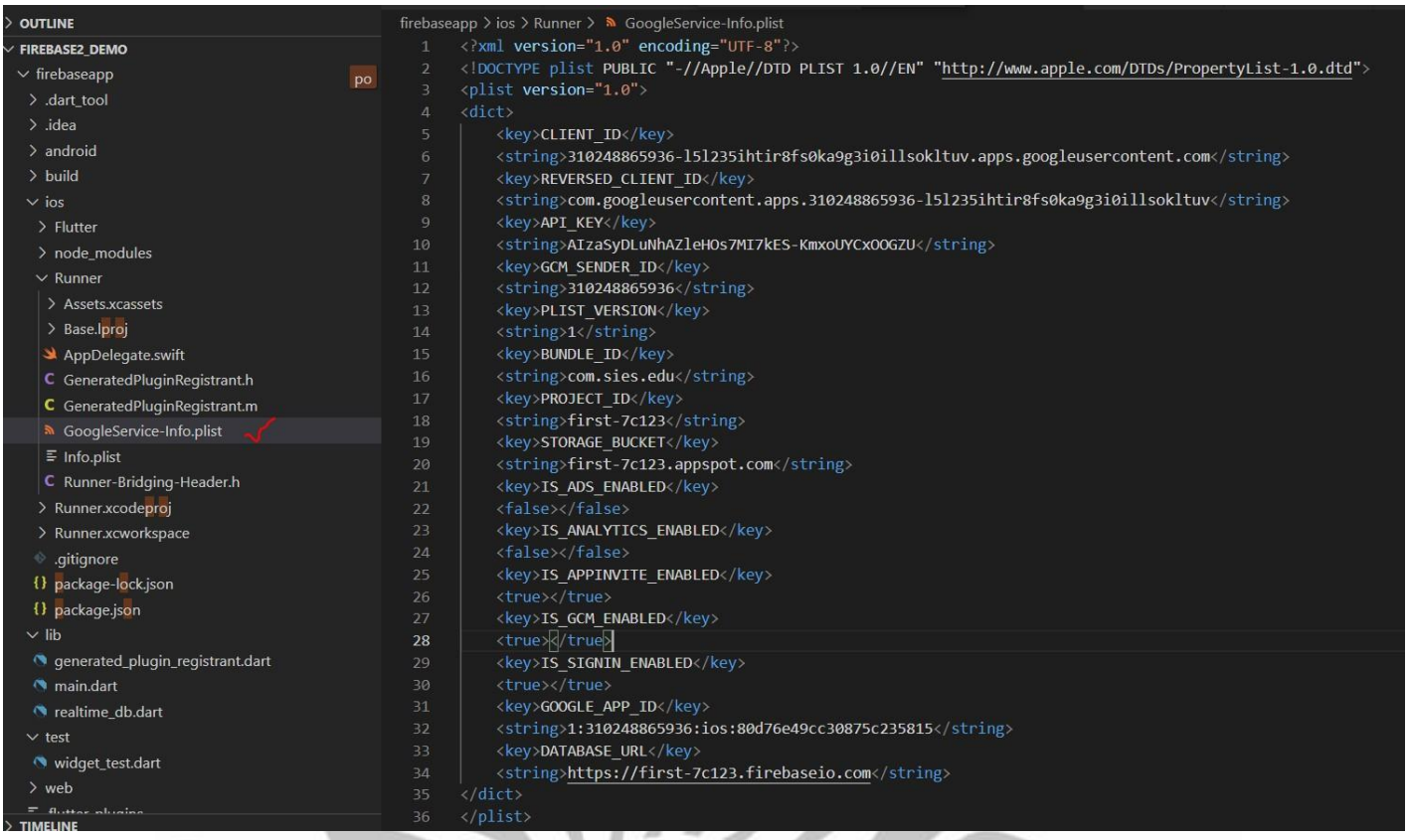
Next, click the **Download GoogleService-Info.plist** button.



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**:

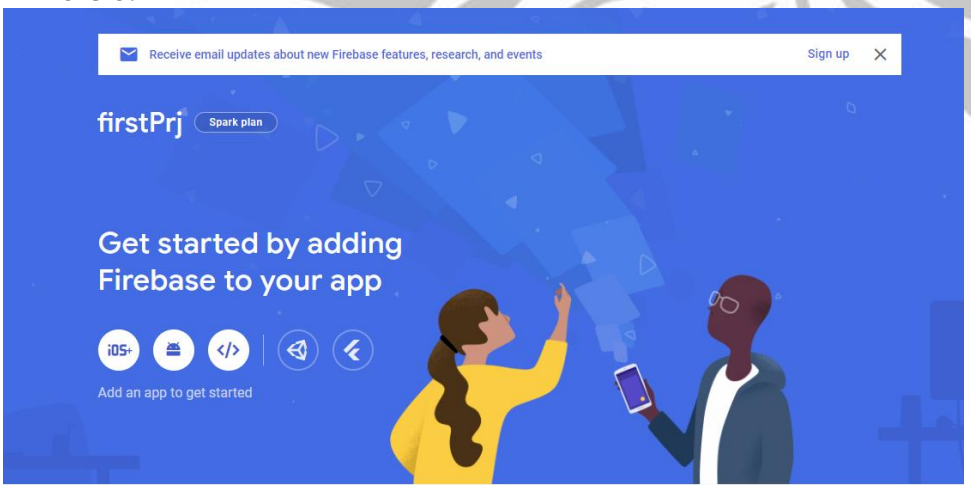




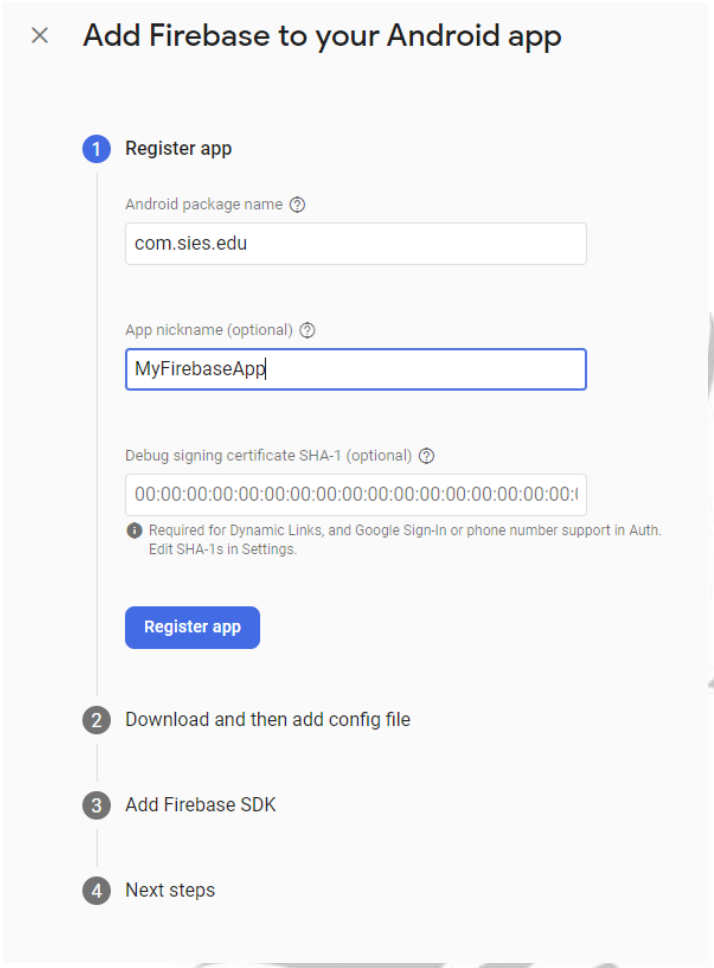
Nice job! Now it's time to register the Android app.

Registering an Android App

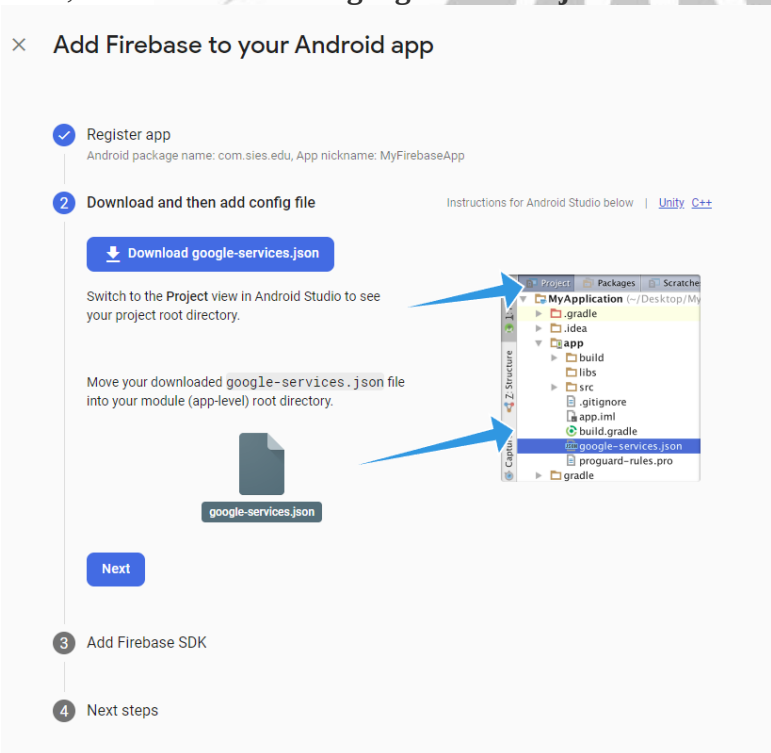
First, go back to the Firebase page. Click the **Android** circle to start the process of adding Firebase to Android.

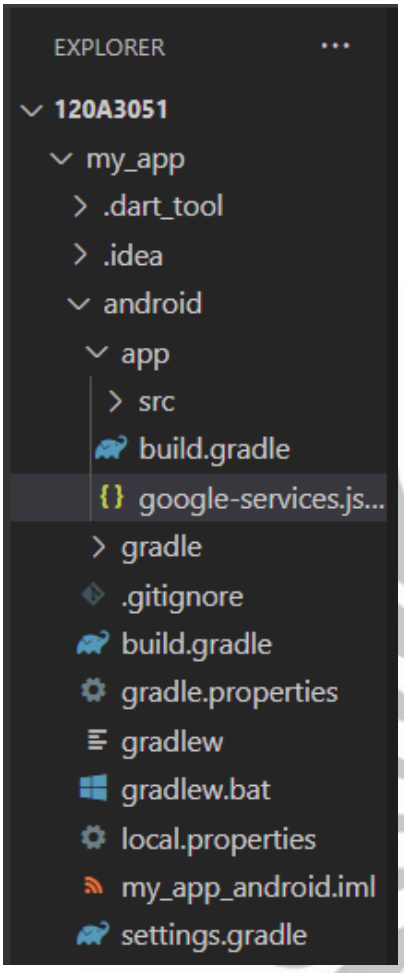


You'll see a dialog to register your app. Enter **com.sies.edu** in the Android package name field. Next, click **Register app**:



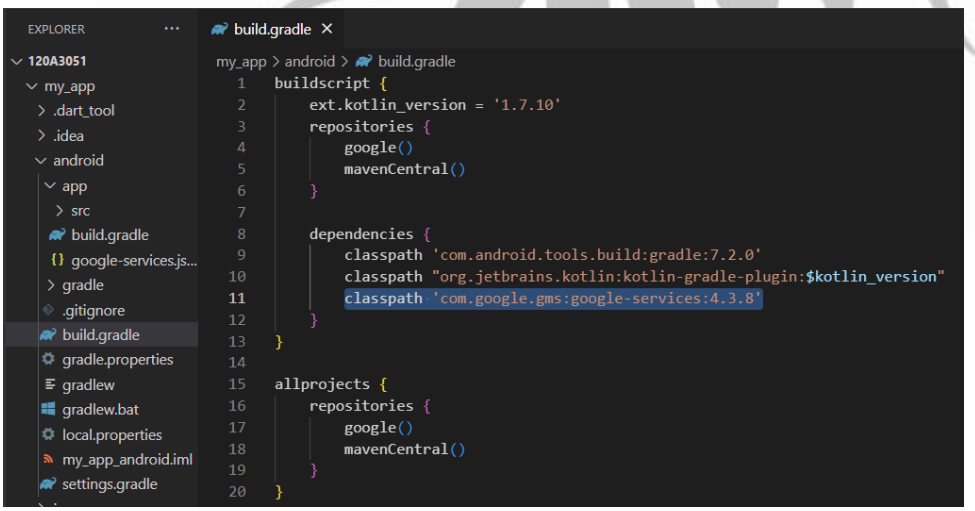
Then, click the **Download google-services.json** button and move this file into the **android ▸ app** folder.





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

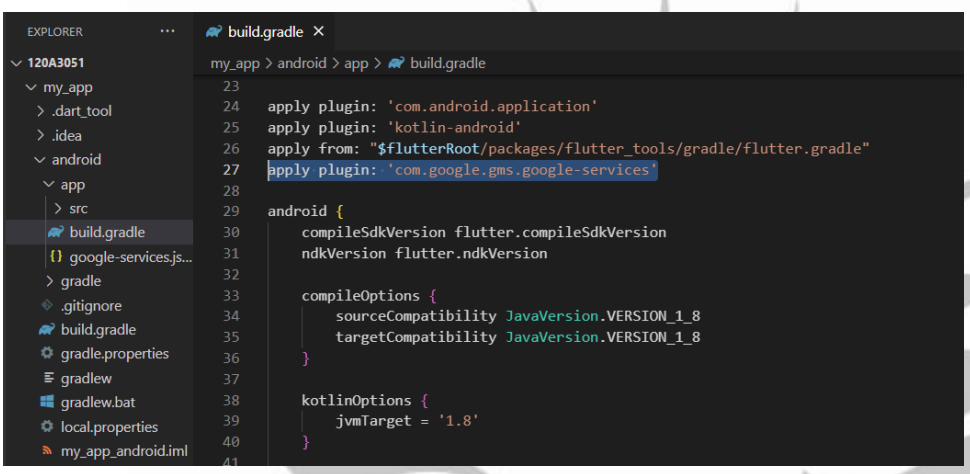
```
classpath 'com.google.gms:google-services:4.3.8'
```



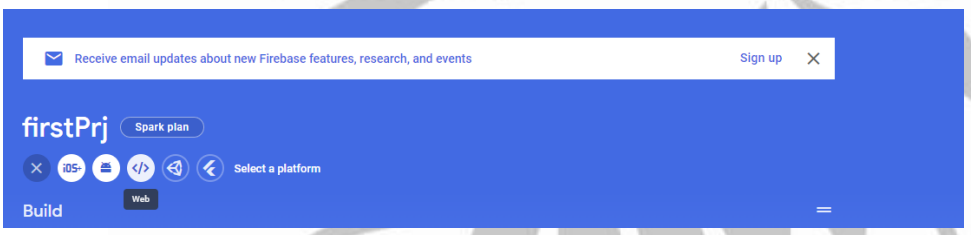
Then, open **android/app/build.gradle** and add the following plugin after the '`apply from'` entry:

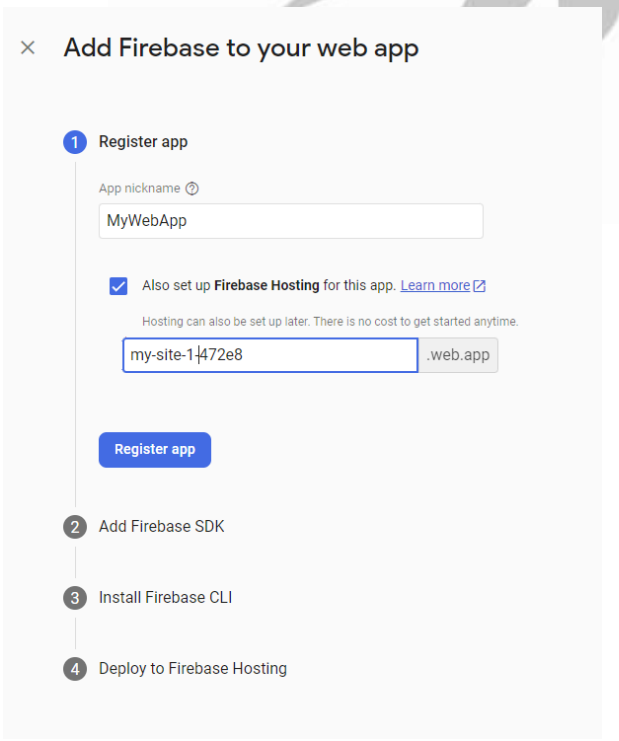
```
apply plugin: 'com.google.gms.google-services'
```

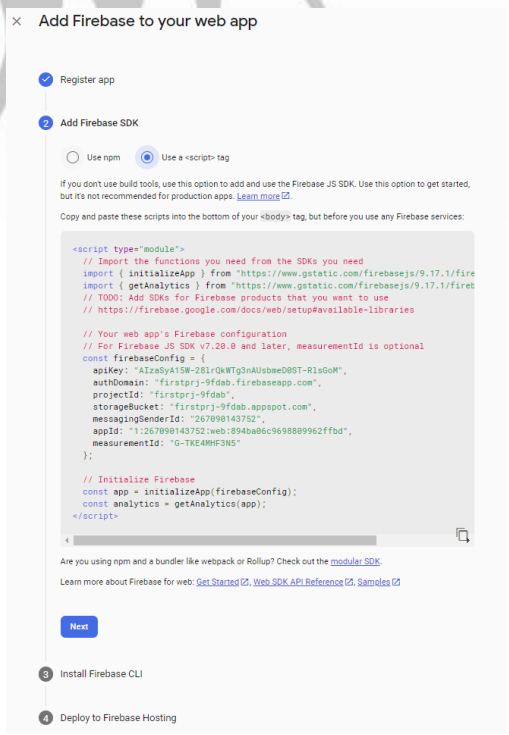
```
apply plugin: 'com.android.application'
apply plugin: 'kotlin-android'
apply from: "$flutterRoot/packages/flutter_tools/gradle/flutter.gradle"
apply plugin: 'com.google.gms.google-services'

android {
    compileSdkVersion 30
```



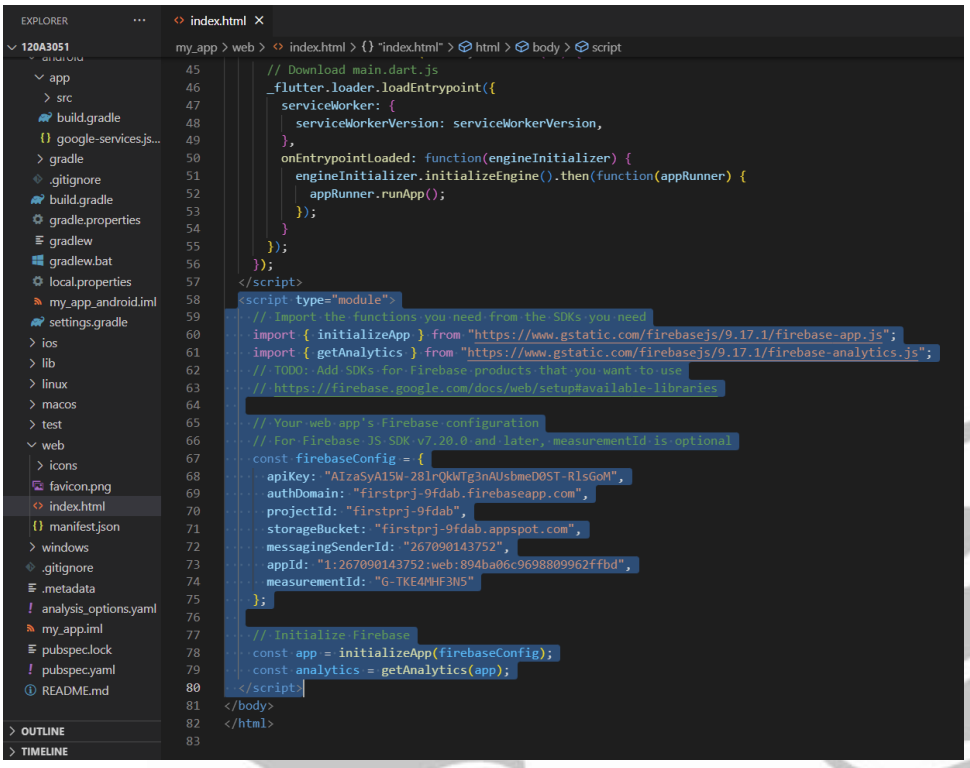
Registering on Web: In the web section, copy the firebaseConfig details







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



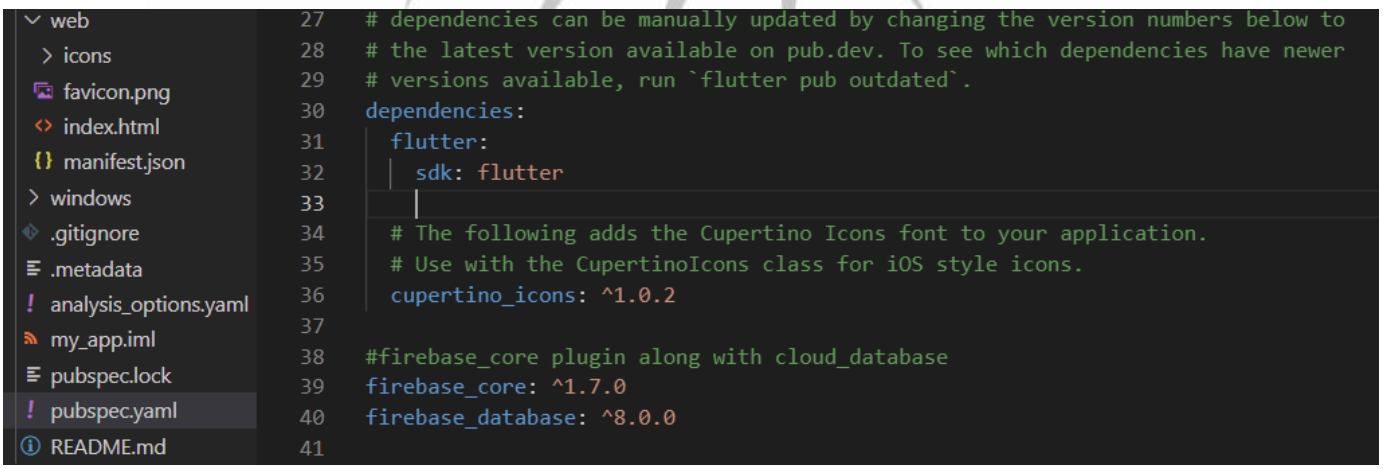
Initializing Firebase App

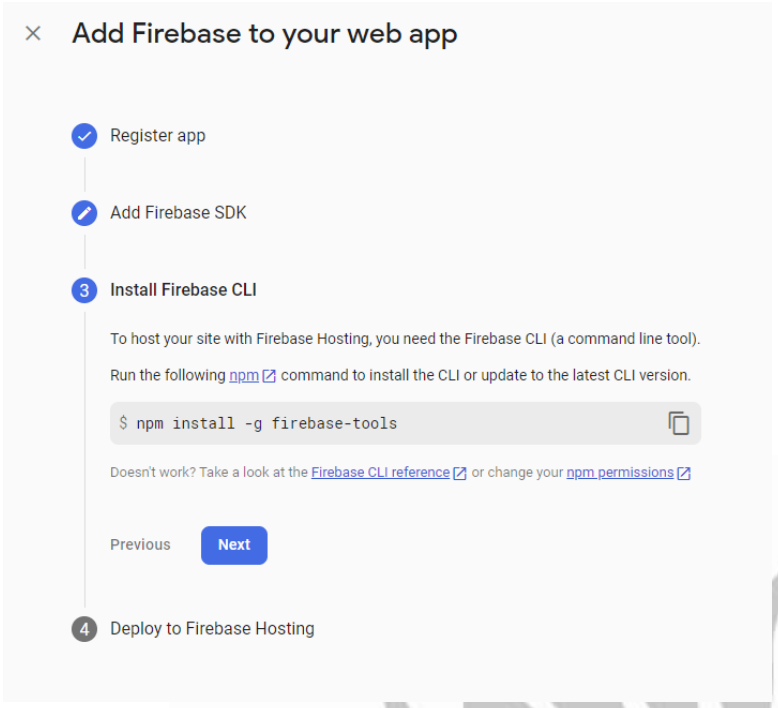
Before you use Firebase services, you'll need to initialize your Firebase App. To do this, you'll need to add the **firebase_core** plugin along with cloud_database.

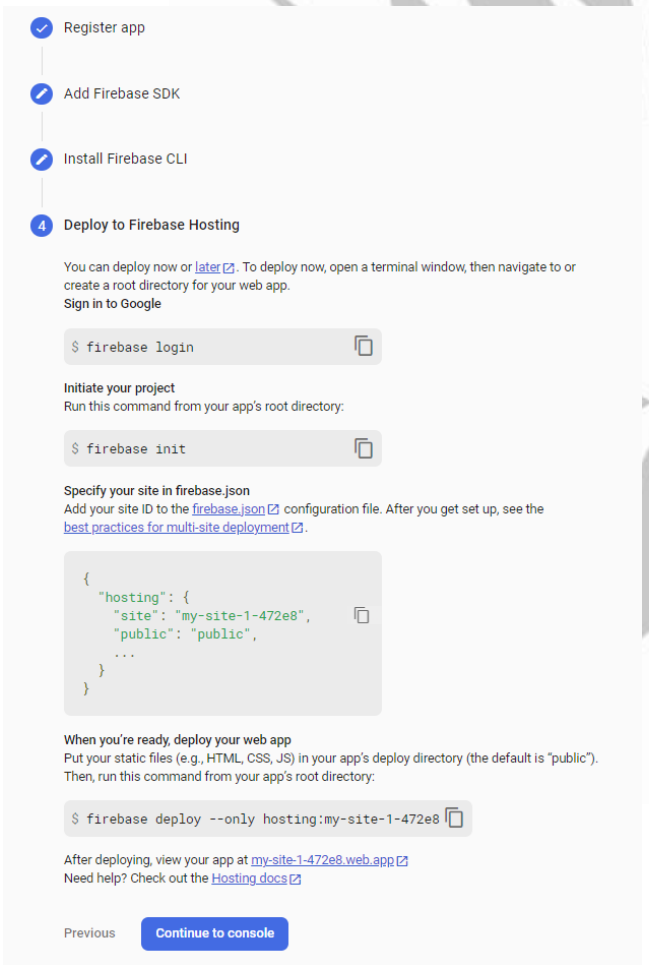
Open the **pubspec.yaml** file in your project and add the following dependencies, then click Pub get:

firebase_core: ^1.7.0

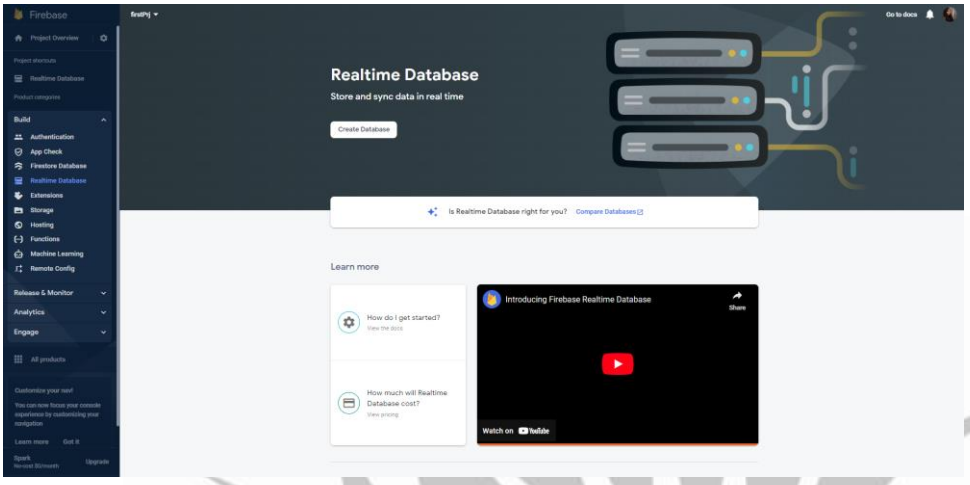
firebase_database: ^8.0.0

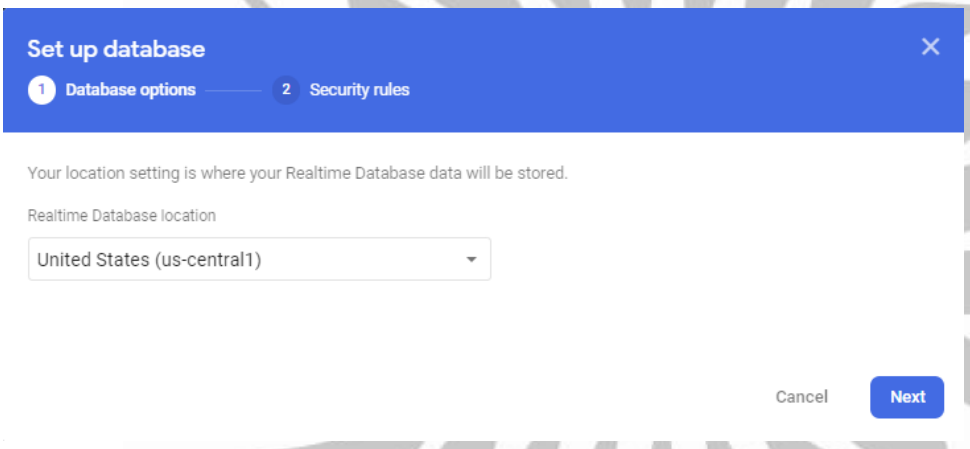


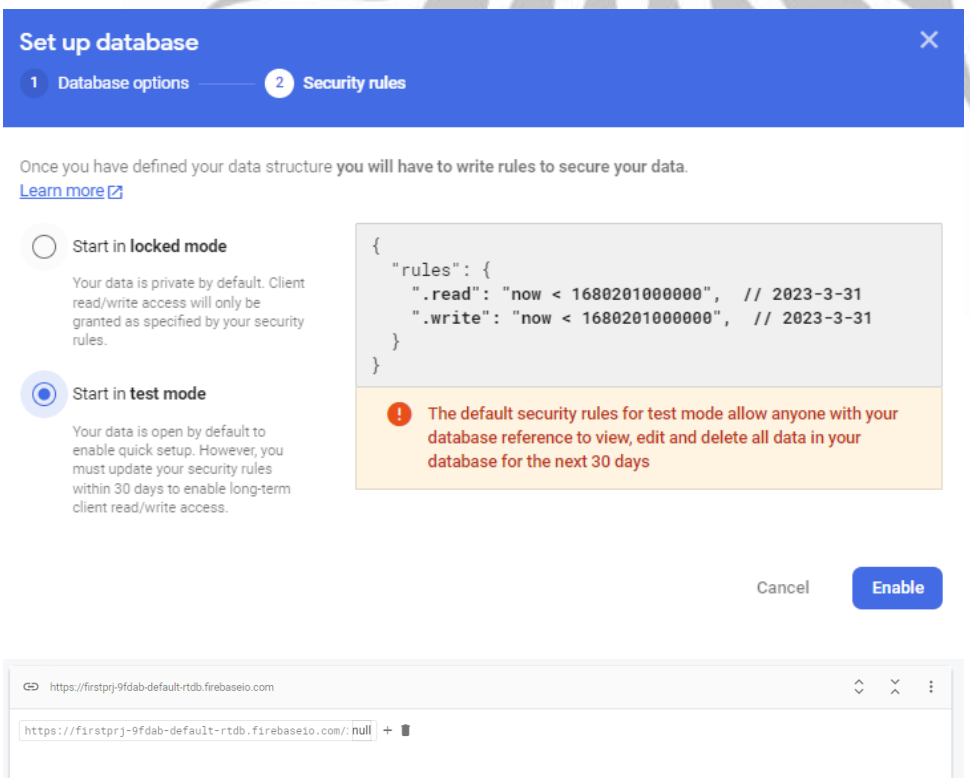

Add Firebase to your web app
Register app
Add Firebase SDK
3
Install Firebase CLI
To host your site with Firebase Hosting, you need the Firebase CLI (a command line tool).
Run the following npm command to install the CLI or update to the latest CLI version.
$ npm install -g firebase-tools
Doesn't work? 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

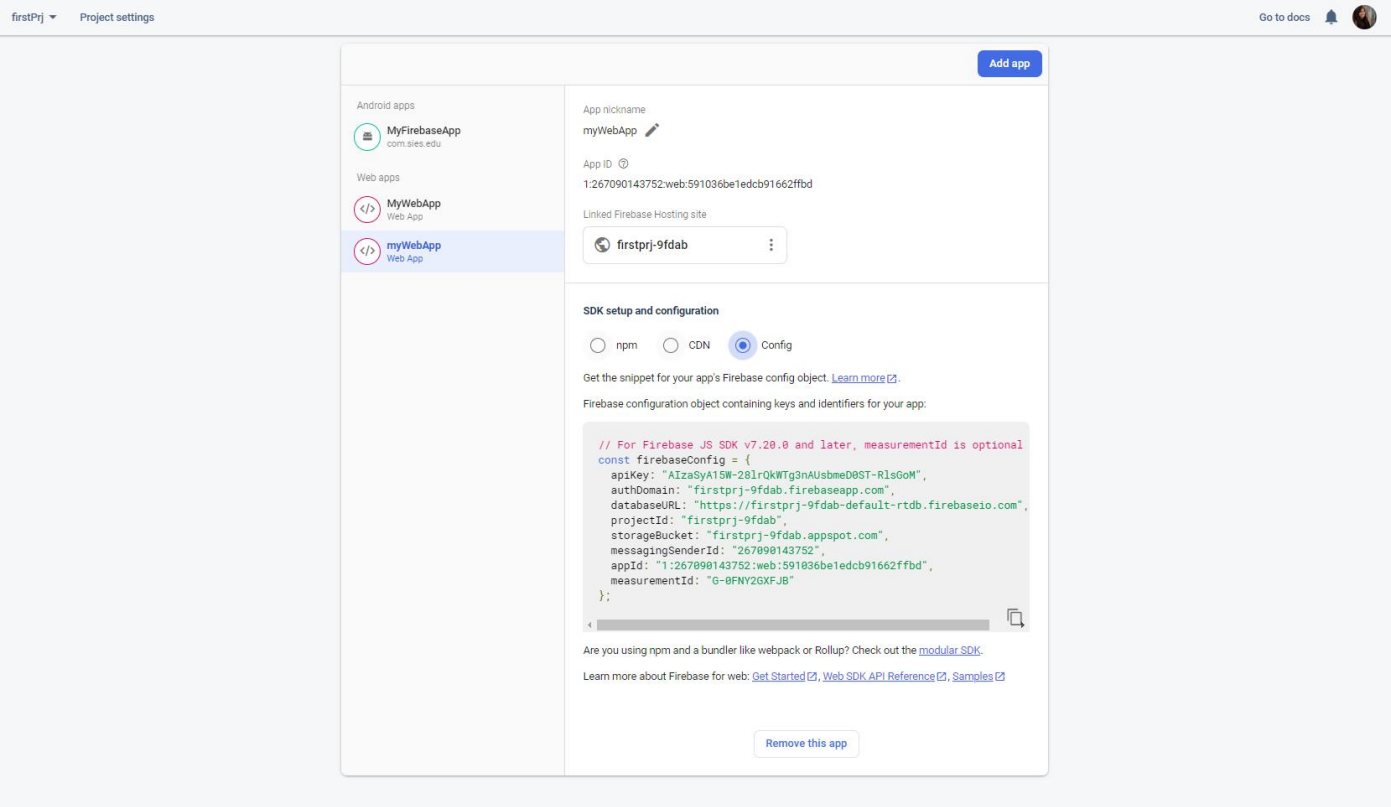
Firebase Console project setup:







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:

```dart
import 'package:flutter/material.dart';
import 'package:firebase_core/firebase_core.dart';
//import 'package:firebaseapp/realtime_db.dart';

Run | Debug | Profile
Future<void> main() async {
  WidgetsFlutterBinding.ensureInitialized();
  // For Firebase JS SDK v7.20.0 and later, measurementId is optional
  FirebaseApp firebaseApp = await Firebase.initializeApp(
    options: const FirebaseOptions(
        apiKey: "AIzaSyA15W-28lrQkWTg3nAUsbmeD0ST-RlsGoM",
        authDomain: "firstprj-9fdab.firebaseapp.com",
        databaseURL: "https://firstprj-9fdab-default-rtdb.firebaseio.com",
        projectId: "firstprj-9fdab",
        storageBucket: "firstprj-9fdab.appspot.com",
        messagingSenderId: "267090143752",
        appId: "1:267090143752:web:591036be1edcb91662ffbd",
        measurementId: "G-0FNY2GXFJB"),
  );
  // runApp(const MaterialApp(
  //   home: realtime_db(),
  // ));
}
```

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

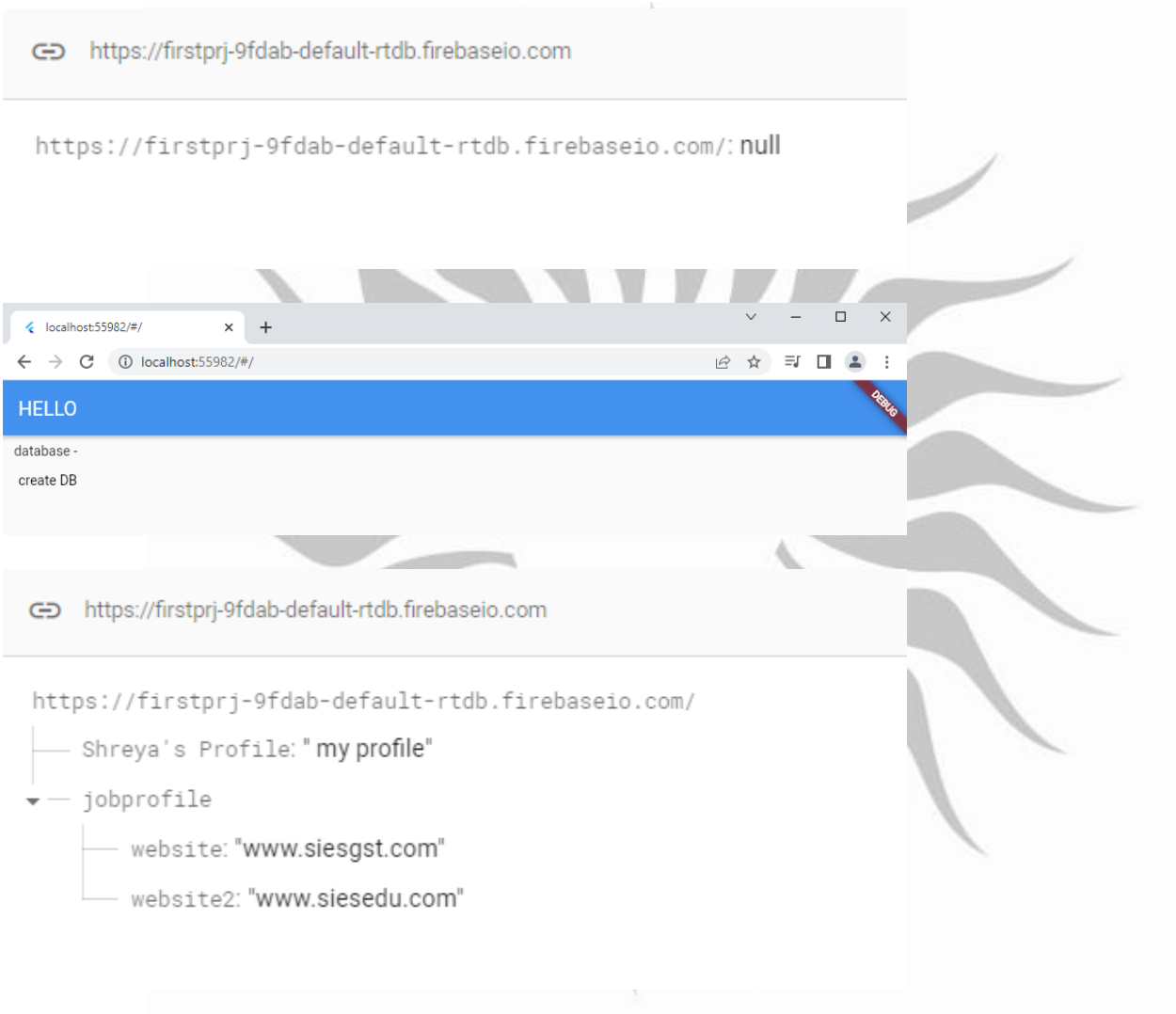
main.dart realtime_db.dart

lib > realtime_db.dart > ...

```dart
import 'package:firebase_database/firebase_database.dart';
import 'package:flutter/cupertino.dart';
import 'package:flutter/material.dart';

class realtime_db extends StatefulWidget {
  const realtime_db({super.key});

  @override
  State<realtime_db> createState() => _realtime_dbState();
}

class _realtime_dbState extends State<realtime_db> {
  late DatabaseReference _dbref;
  String databasejson = "";
  @override
  void initState() {
    super.initState();
    _dbref = FirebaseDatabase.instance.ref();
  }

```

```dart
@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"});
}
}
```

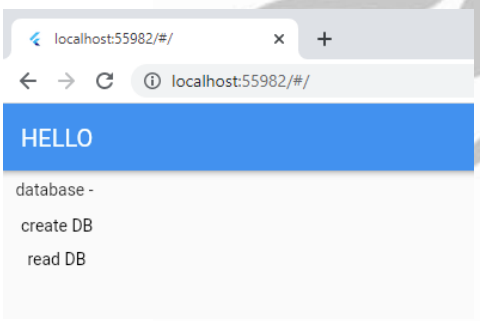
```
PS C:\Users\exam\Desktop\120A3051\my_app> flutter run
Multiple devices found:
Windows (desktop) • windows • windows-x64    • Microsoft Windows [Version 10.0.19045.2486]
Chrome (web)      • chrome  • web-javascript • Google Chrome 110.0.5481.178
Edge (web)        • edge    • web-javascript • Microsoft 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/QEiSzirNBAY=/ws
Debug service listening on ws://127.0.0.1:56031/QEiSzirNBAY=/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/QEiSzirNBAY=
The Flutter DevTools debugger and profiler on Chrome is available at: http://127.0.0.1:9101?uri=http://127.0.0.1:56031/QEiSzirNBAY=
```



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
}
```

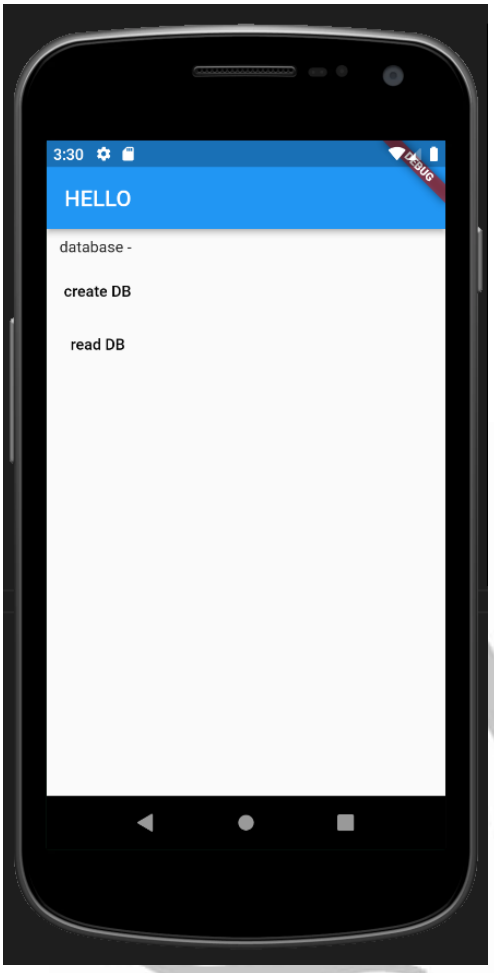
android > app > src > main > AndroidManifest.xml

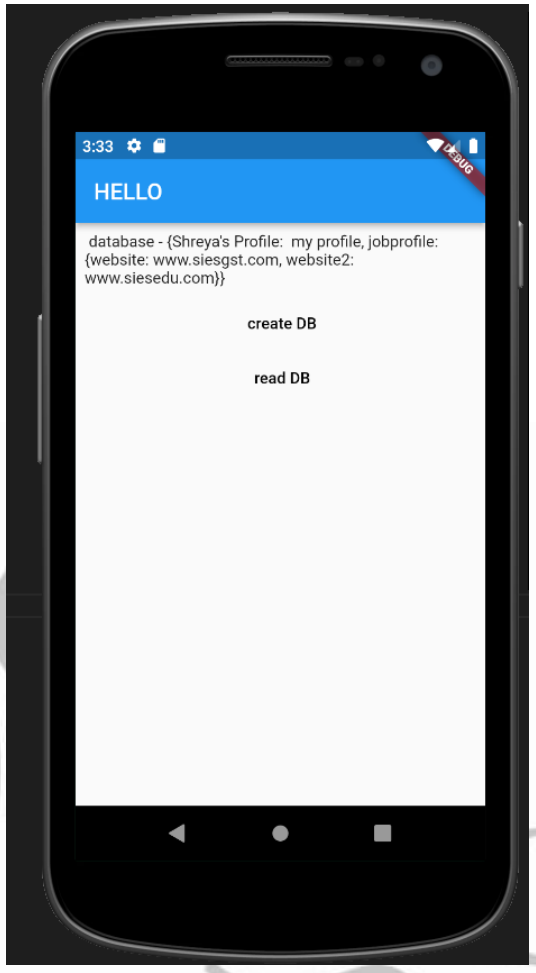
```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.my_app">
    <uses-permission android:name="android.permission.INTERNET" />
```

main.dart | build.gradle | AndroidManifest.xml

lib > main.dart > main

```
import 'package:flutter/material.dart';
import 'package:firebase_core/firebase_core.dart';
import './realtime_db.dart';

Run | Debug | Profile
Future<void> main() async {
  WidgetsFlutterBinding.ensureInitialized();
  // For Firebase JS SDK v7.20.0 and later, measurementId is optional
  FirebaseApp firebaseApp = await Firebase.initializeApp(
    name: "my_app",
    options: const FirebaseOptions(
        apiKey: "AIzaSyA15W-28lrQkWTg3nAUsbmeD0ST-RlsGoM",
        authDomain: "firstprj-9fdab.firebaseapp.com",
        databaseURL: "https://firstprj-9fdab-default-rtdb.firebaseio.com",
        projectId: "firstprj-9fdab",
        storageBucket: "firstprj-9fdab.appspot.com",
        messagingSenderId: "267090143752",
        appId: "1:267090143752:web:591036be1edcb91662ffbd",
        measurementId: "G-0FNY2GXFJB"),
  );
  runApp(const MaterialApp(
    home: realtime_db(),
  )); // MaterialApp
}
```





Conclusion: Successfully connected Flutter UI with Firebase realtime database.