

120A3051**Shreya Idate****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.

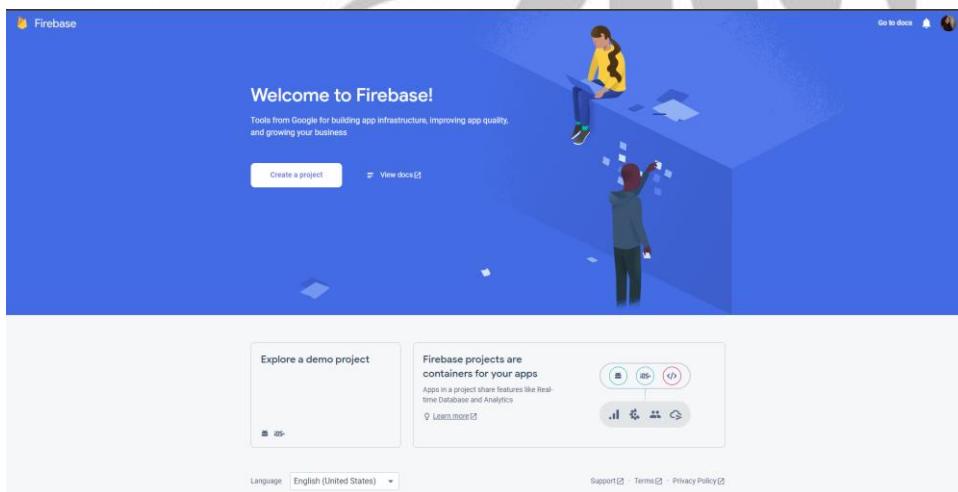
Flutter is a cross-platform development framework. So Flutter 2 now officially releases the stable version of flutter web. Same like flutter App, to read data from realtime database in flutter web, no need to add extra code. The same code base will be executed on the flutter web as well. All you need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

X Create a project (Step 1 of 3)

Let's start with a name for your project ®

Project name
firstPrj

firstPrj-9fLab siesgst.ac.in

I accept the [Firebase terms](#) Learn more

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

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**.

X 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 Learn more
- Crash-free users Learn more
- User segmentation & targeting across Learn more
- Firebase products Learn more
- Event-based Cloud Functions triggers Learn more
- Free unlimited reporting Learn more

Enable Google Analytics for this project Recommended

Previous **Continue**



X Create a project (Step 3 of 3)

Configure Google Analytics

Analytics location Learn more
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

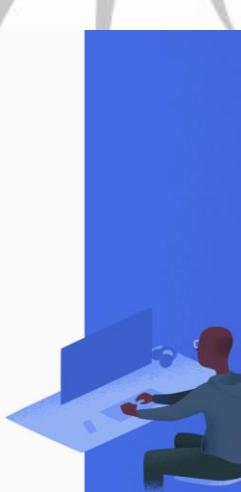
Use the default settings for sharing Google Analytics data. [Learn more](#)

- 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](#) Learn more

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.

The screenshot shows a registration dialog titled 'Add Firebase to your Apple app'. It has three steps: Step 1: Register app. The first field is 'Apple bundle ID' with the value 'com.sies.edu' (highlighted with a red arrow). The second field is 'App nickname (optional)' with the value 'MyFirebaseApp' (highlighted with a red arrow). The third field is 'App Store ID (optional)' with the value '123456789'. At the bottom is a blue 'Register app' button (highlighted with a red arrow).

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

Register app
iOS bundle ID: com.raywenderlich.petMedical

2 Download config file

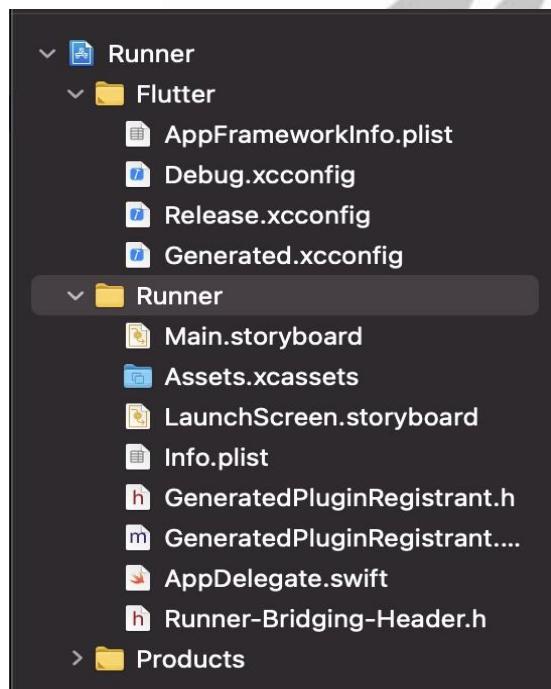
[Download GoogleService-Info.plist](#)

Move the GoogleService-Info.plist file that you just downloaded into the root of your Xcode project and add it to all targets.

Next

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**:



The screenshot shows the Xcode interface with the project outline on the left and the code editor on the right. The code editor displays the GoogleService-Info.plist file, which contains the following XML configuration:

```

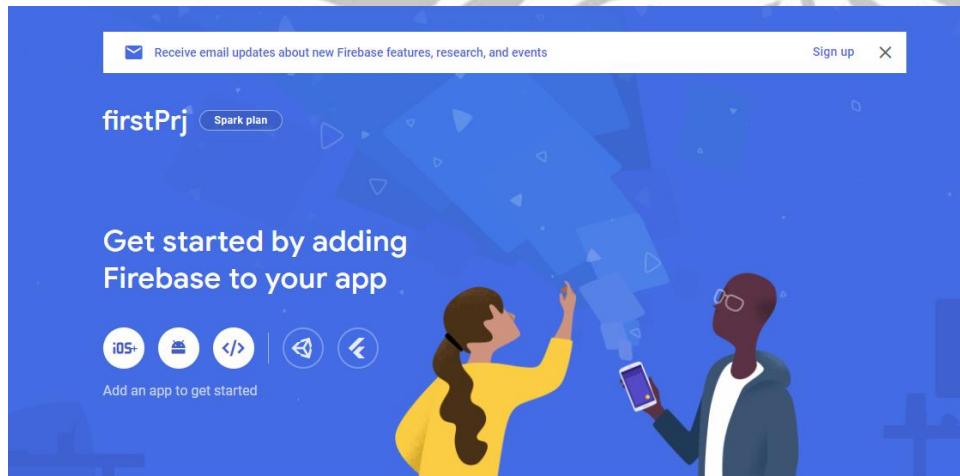
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
    <key>CLIENT_ID</key>
    <string>310248865936-151235ihtir8fs0ka9g3i0illsokltuv.apps.googleusercontent.com</string>
    <key>REVERSED_CLIENT_ID</key>
    <string>com.googleusercontent.apps.310248865936-151235ihtir8fs0ka9g3i0illsokltuv</string>
    <key>API_KEY</key>
    <string>AIzaSyDLuNhAZleHos7MI7kES-KmxoUYCx0OGZU</string>
    <key>GCM_SENDER_ID</key>
    <string>310248865936</string>
    <key>PLIST_VERSION</key>
    <string>1</string>
    <key>BUNDLE_ID</key>
    <string>com.sies.edu</string>
    <key>PROJECT_ID</key>
    <string>first-7c123</string>
    <key>STORAGE_BUCKET</key>
    <string>first-7c123.appspot.com</string>
    <key>ISADS_ENABLED</key>
    <false></false>
    <key>ISANALYTICS_ENABLED</key>
    <false></false>
    <key>ISAPPINVITE_ENABLED</key>
    <true></true>
    <key>ISGCM_ENABLED</key>
    <true></true>
    <key>ISSIGNIN_ENABLED</key>
    <true></true>
    <key>GOOGLE_APP_ID</key>
    <string>1:310248865936:ios:80d76e49cc30875c235815</string>
    <key>DATABASE_URL</key>
    <string>https://first-7c123.firebaseio.com</string>
</dict>
</plist>

```

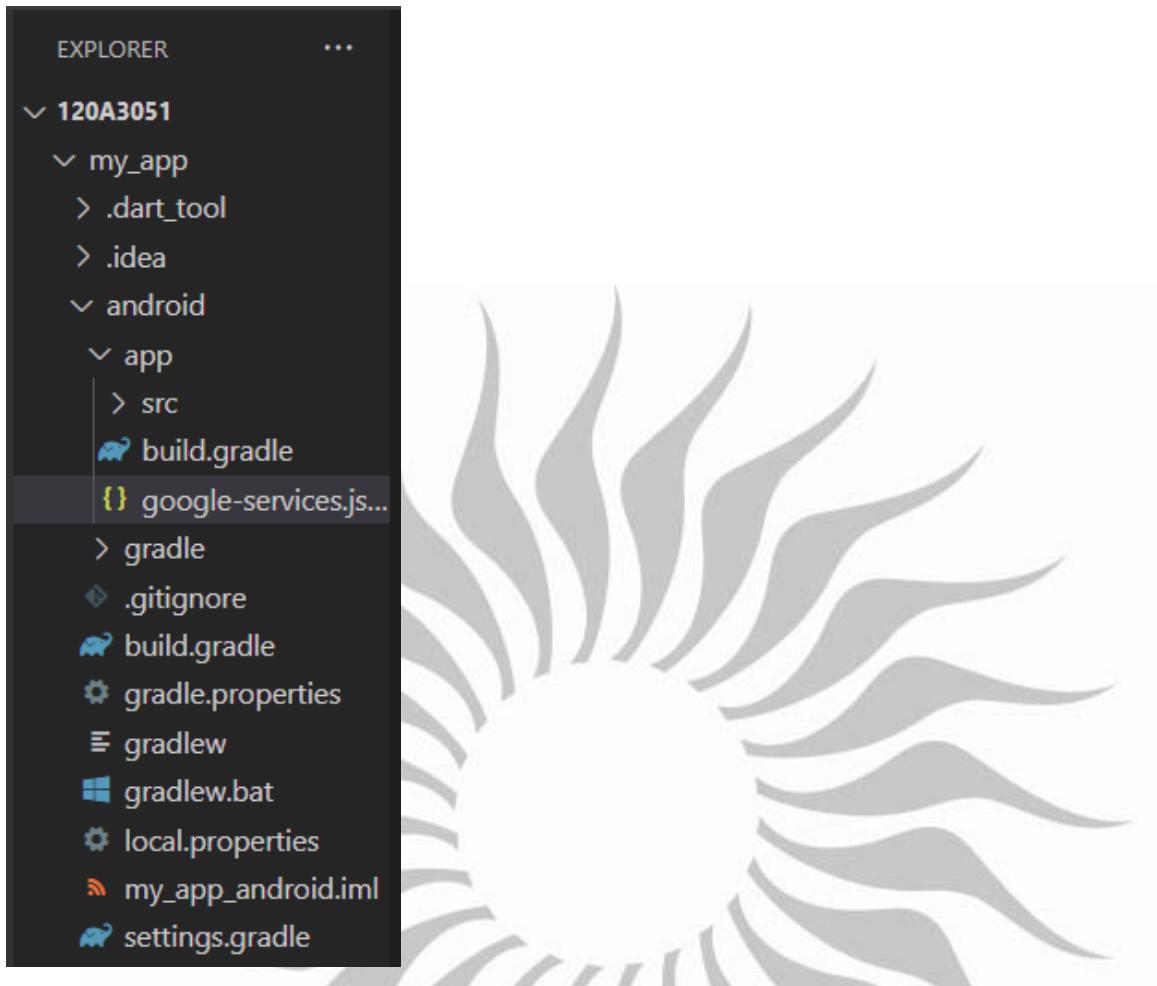
Nice job! Now it's time to register the Android app.

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'
```

The screenshot shows the 'build.gradle' file for the 'app' module. The 'dependencies' block is expanded, showing the following code:

```
buildscript {
    ext.kotlin_version = '1.7.10'
    repositories {
        google()
        mavenCentral()
    }
    dependencies {
        classpath 'com.android.tools.build:gradle:7.2.0'
        classpath "org.jetbrains.kotlin:kotlin-gradle-plugin:$kotlin_version"
        classpath 'com.google.gms:google-services:4.3.8'
    }
}
allprojects {
    repositories {
        google()
        mavenCentral()
    }
}
```

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
```

```
EXPLORER ... build.gradle
120A3051 my_app > android > app > build.gradle
my_app 23
24 apply plugin: 'com.android.application'
25 apply plugin: 'kotlin-android'
26 apply from: "$flutterRoot/packages/flutter_tools/gradle/flutter.gradle"
27 apply plugin: 'com.google.gms.google-services'
28
29 android {
30     compileSdkVersion flutter.compileSdkVersion
31     ndkVersion flutter.ndkVersion
32
33     compileOptions {
34         sourceCompatibility JavaVersion.VERSION_1_8
35         targetCompatibility JavaVersion.VERSION_1_8
36     }
37
38     kotlinOptions {
39         jvmTarget = '1.8'
40     }
41 }
```

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

firstPrj Spark plan

Select a platform

Build Web

Add Firebase to your web app

1 Register app

App nickname: MyWebApp

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

Hosting can also be set up later. There is no cost to get started anytime.

my-site-1472e8.web.app

Register app

2 Add Firebase SDK

Use npm Use a <script> tag

If you don't use build tools, use this option to add and use the Firebase JS SDK. Use this option to get started, but it's not recommended for production apps. [Learn more](#)

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/9.17.1/firebase-app.js"
import { getAnalytics } from "https://www.gstatic.com/firebasejs/9.17.1/firebase-analytics.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
// For Firebase JS SDK v7.20.0 and later, measurementId is optional
const firebaseConfig = {
 apiKey: "AIzaSyA1SW-2B1QWTg3nAUshm08GT-R1sg0M",
 authDomain: "firstprj-9fdbd.firebaseioapp.com",
 projectId: "firstprj-9fdbd",
 storageBucket: "firstprj-9fdbd.appspot.com",
 messagingSenderId: "267996143752",
 appId: "1:267996143752:web:894ba86c9698889962ffbd",
 measurementId: "G-TKE4MF5NS"
};

// Initialize Firebase
const app = initializeApp(firebaseConfig);
const analytics = getAnalytics(app);

Are you using npm and a bundler like webpack or Rollup? Check out the [modular SDK](#).

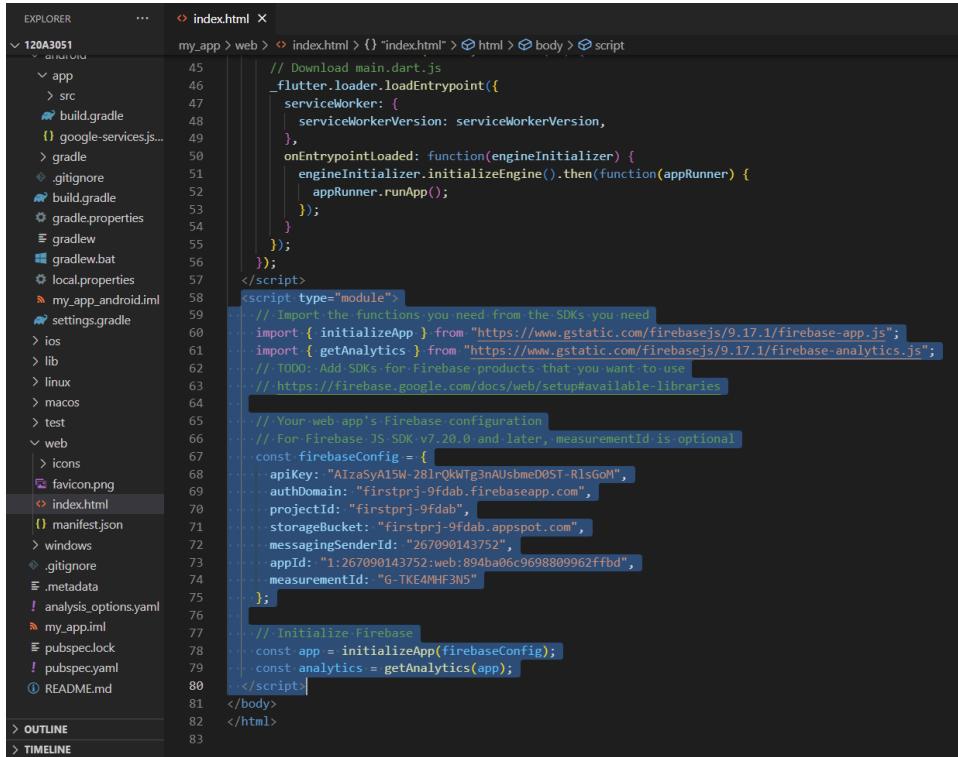
Learn more about Firebase for web: [Get Started](#) [Web SDK API Reference](#) [Samples](#)

Next

3 Install Firebase CLI

4 Deploy to Firebase Hosting

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



```

EXPLORER      ...   ▶ index.html ×
120A3051      my_app > web > ▶ index.html > {} "index.html" > html > body > script
  <script>
    // Download main.dart.js
    _flutter.loader.loadEntrypoint({
      serviceWorker: {
        serviceWorkerVersion: serviceWorkerVersion,
      },
      onEntrypointLoaded: function(engineInitializer) {
        engineInitializer.initializeEngine().then(function(appRunner) {
          appRunner.runApp();
        });
      }
    });
  </script>
  <script type="module">
    // Import the functions you need from the SDKs you need
    import { initializeApp } from "https://www.gstatic.com/firebasejs/9.17.1/firebase-app.js";
    import { getAnalytics } from "https://www.gstatic.com/firebasejs/9.17.1/firebase-analytics.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
    // For Firebase JS SDK v7.20.0 and later, measurementId is optional
    const firebaseConfig = {
      apiKey: "AIzaSyA15W-281rQkNTg3nAUslmeD8ST-R1sgoM",
      authDomain: "firstprj-9fdb.firebaseio.com",
      projectId: "firstprj-9fdb",
      storageBucket: "firstprj-9fdb.appspot.com",
      messagingSenderId: "267090143752",
      appId: "1:267090143752:web:894ba06c969880962ffbd",
      measurementId: "G-TKE4HfE3N5"
    };
    // Initialize Firebase
    const app = initializeApp(firebaseConfig);
    const analytics = getAnalytics(app);
  </script>
</body>
</html>

```

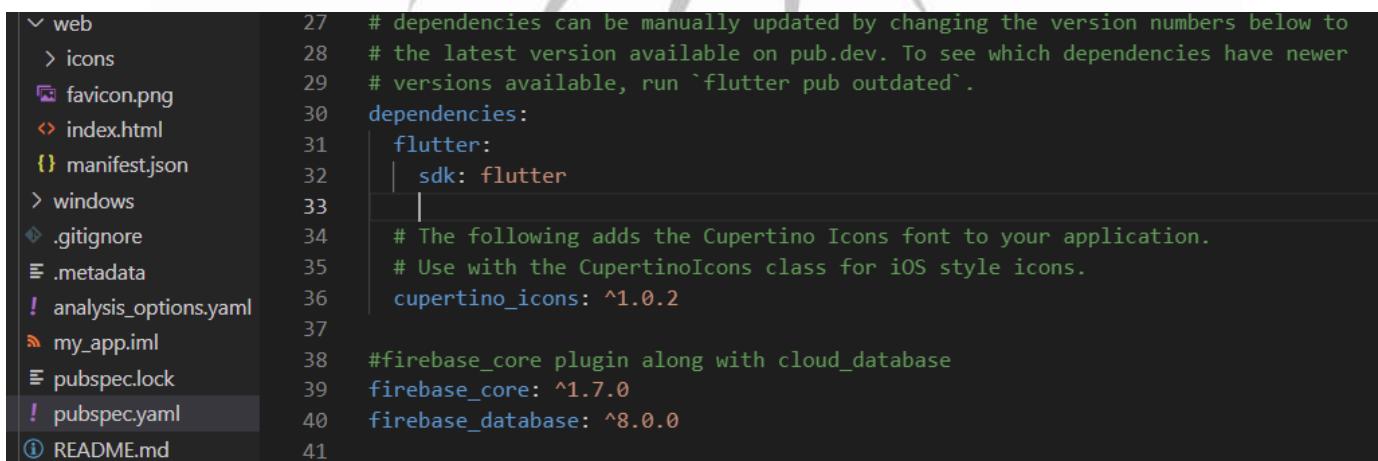
Initializing Firebase App

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
  # dependencies can be manually updated by changing the version numbers below to
  # the latest version available on pub.dev. To see which dependencies have newer
  # versions available, run `flutter pub outdated`.
  dependencies:
    flutter:
      sdk: flutter
    # The following adds the Cupertino Icons font to your application.
    # Use with the CupertinoIcons class for iOS style icons.
    cupertino_icons: ^1.0.2
    #firebase_core plugin along with cloud_database
    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
```



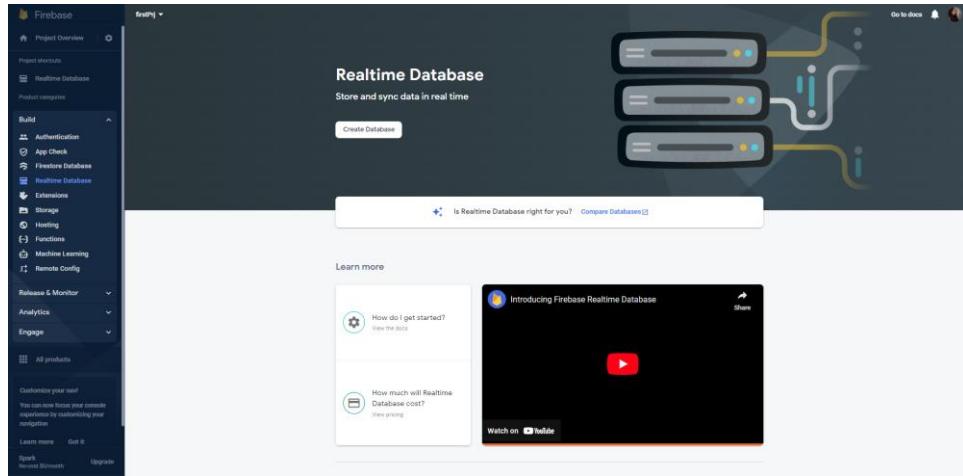
After deploying, view your app at [my-site-1-472e8.web.app](#)

Need help? Check out the [Hosting docs](#)

Previous

Continue to console

Firebase Console project setup:



Set up database

1 Database options —— 2 Security rules

Your location setting is where your Realtime Database data will be stored.

Realtime Database location

United States (us-central1)

Cancel Next

Set up database

1 Database options —— 2 Security rules

Once you have defined your data structure you will have to write rules to secure your data.

[Learn more](#)

Start in **locked mode**

Your data is private by default. Client read/write access will only be granted as specified by your security rules.

Start in **test mode**

Your data is open by default to enable quick setup. However, you must update your security rules within 30 days to enable long-term client read/write access.

```
{
  "rules": {
    ".read": "now < 1680201000000", // 2023-3-31
    ".write": "now < 1680201000000", // 2023-3-31
  }
}
```

! The default security rules for test mode allow anyone with your database reference to view, edit and delete all data in your database for the next 30 days

Cancel Enable



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

The screenshot shows the Firebase Project Settings interface. On the left, there's a sidebar with 'firstPrj' and 'Project settings'. The main area shows 'Android apps' with 'MyFirebaseApp' and 'Web apps' with 'MyWebApp' and 'myWebApp'. The 'myWebApp' item is selected. On the right, under 'SDK setup and configuration', the 'Config' tab is selected. It displays the Firebase configuration object containing keys and identifiers for the app. The code is as follows:

```
// For Firebase JS SDK v7.20.0 and later, measurementId is optional
const firebaseConfig = {
  apiKey: "AIzaSyA15W-281rQkWTg3nAUusbmeD0ST-RlsGoM",
  authDomain: "firstprj-9fdb.firebaseio.com",
  databaseURL: "https://firstprj-9fdb.firebaseio.com",
  projectId: "firstprj-9fdb",
  storageBucket: "firstprj-9fdb.appspot.com",
  messagingSenderId: "267090143752",
  appId: "1:267090143752:web:591036be1edcb91662ffbd",
  measurementId: "G-0FNY2GXFJB"
};
```

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

```
lib > main.dart > ...
1 import 'package:flutter/material.dart';
2 import 'package:firebase_core/firebase_core.dart';
3 //import 'package:firebaseapp realtime_db.dart';
4
5 Run | Debug | Profile
6 Future<void> main() async {
7   WidgetsFlutterBinding.ensureInitialized();
8   // For Firebase JS SDK v7.20.0 and later, measurementId is optional
9   FirebaseApp firebaseApp = await Firebase.initializeApp(
10     options: const FirebaseOptions(
11       apiKey: "AIzaSyA15W-281rQkWTg3nAUusbmeD0ST-RlsGoM",
12       authDomain: "firstprj-9fdb.firebaseio.com",
13       databaseURL: "https://firstprj-9fdb.firebaseio.com",
14       projectId: "firstprj-9fdb",
15       storageBucket: "firstprj-9fdb.appspot.com",
16       messagingSenderId: "267090143752",
17       appId: "1:267090143752:web:591036be1edcb91662ffbd",
18       measurementId: "G-0FNY2GXFJB"),
19   // runApp(const MaterialApp(
20   //   home: realtime_db(),
21   // ));
22 }
```

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 > ...
1 import 'package:firebase_database.firebaseio_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/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://127.0.0.1:56031/QEiSzirNBAY=
```

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

localhost:55982/#/

HELLO

database -

create DB

DEBUG

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

Shreya's Profile: "my profile"

jobprofile

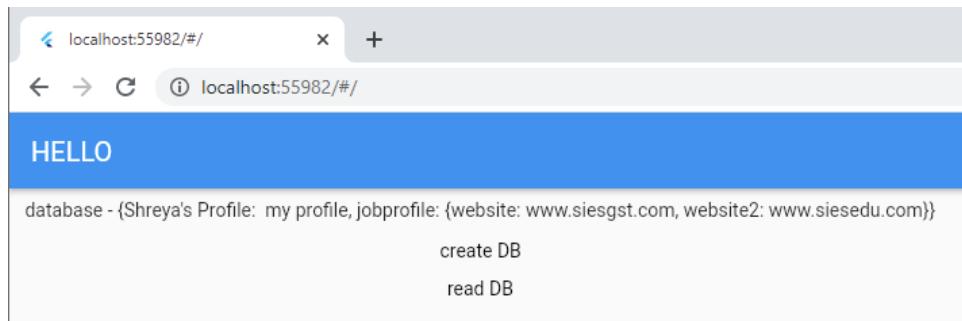
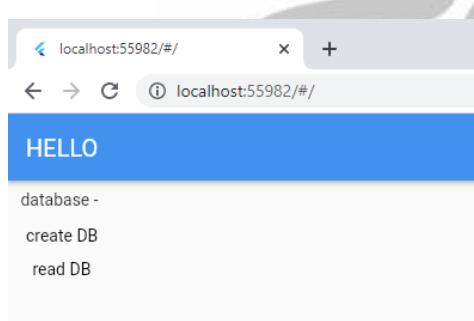
website: "www.siesgst.com"

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.toInt()
    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" />
```

```
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
5 Run | Debug | Profile
6 Future<void> main() async {
7     WidgetsFlutterBinding.ensureInitialized();
8     // For Firebase JS SDK v7.20.0 and later, measurementId is optional
9     FirebaseApp firebaseApp = await Firebase.initializeApp(
10         name: "my_app",
11         options: const FirebaseOptions(
12             apiKey: "AIzaSyA15W-281rQkWTg3nAUsbmeD0ST-RlsGoM",
13             authDomain: "firstprj-9fdab.firebaseio.com",
14             databaseURL: "https://firstprj-9fdab-default-rtdb.firebaseio.com",
15             projectId: "firstprj-9fdab",
16             storageBucket: "firstprj-9fdab.appspot.com",
17             messagingSenderId: "267090143752",
18             appId: "1:267090143752:web:591036be1edcb91662ffbd",
19             measurementId: "G-0FNY2GXFJB"),
20     );
21     runApp(const MaterialApp(
22         home: realtime_db(),
23     )); // MaterialApp
24 }
```



Conclusion: Successfully connected Flutter UI with Firebase realtime database.