FLUTTER FIREBASE

Flutter Course 2021

Null-safety compliance

Caspian Consultancy Services

Modules

Firebase 2021

- Introduction
- Setup
- Create
- Read
- Update
- Delete
- Create a small Firebase project
- Create A Real Firebase project

Introduction

Firebase 2021

CRUD operations are the main functions you want to know as a developer in every language or framework. You will create basic individual CRUD functions. This will help you create complex Firebase apps later.

Firebase Setup

Firebase Setup

Firebase 2021

Prerequisites:

1. Firebase Account, Console (Link with Google Account.
2. A Basic Flutter Project, A Simple, **hellofirebase**.
3. iOS or Android App setup for the Flutter project.

Firebase Setup

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Step 1:

1. You will need to register a Google Firebase Account. If you have a google account, just register Firebase account.
2. Goto https://firebase.google.com

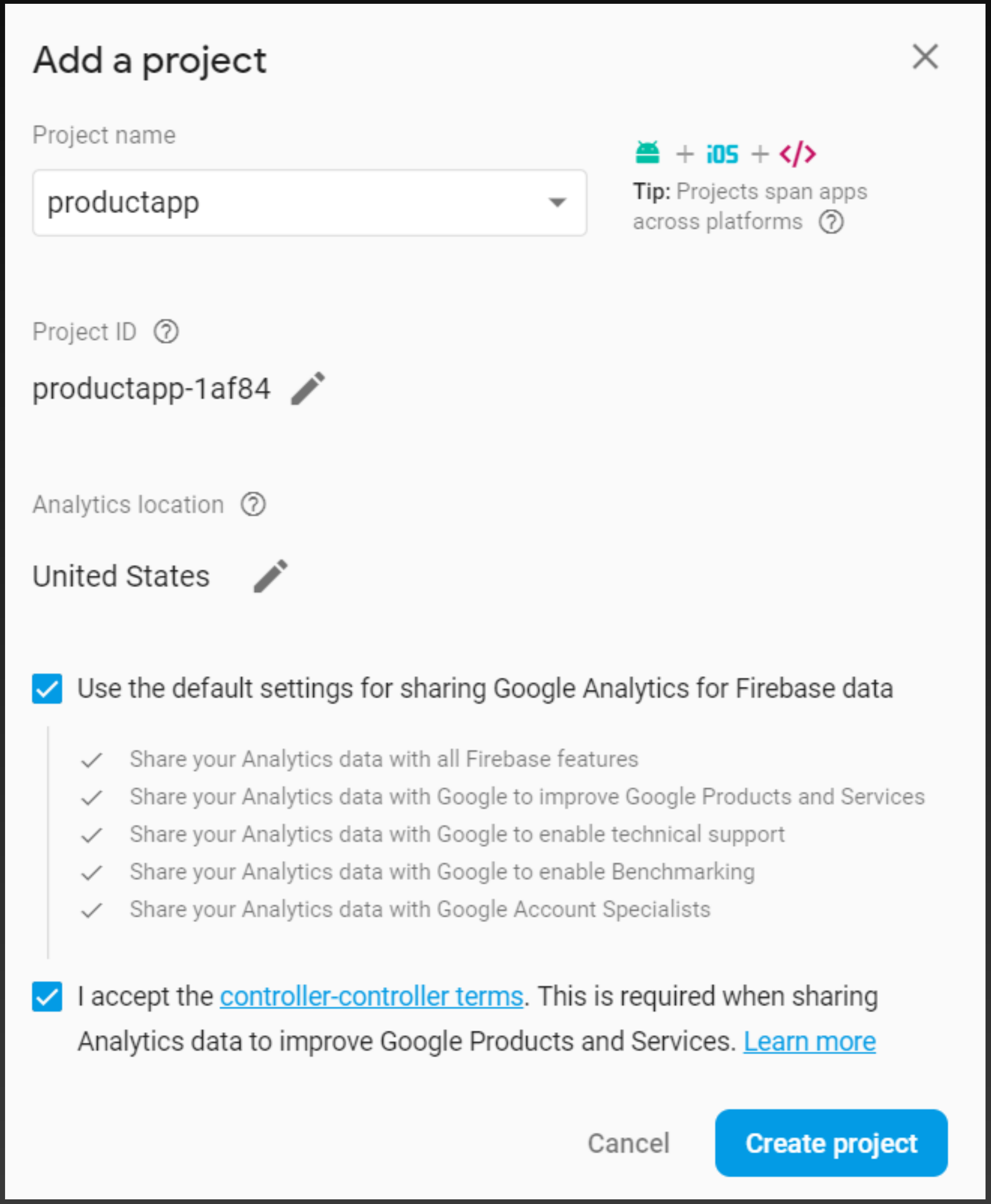
Firebase Setup

Firebase 2021

Create a demo project:

In the Firebase console click add project and give your project name. Example "**productapp**"

After that you can register your Android App or iOS App.



Add a project

Project name

productapp

Tip: Projects span apps across platforms

Project ID

productapp-1af84

Analytics location

United States

✓ Use the default settings for sharing Google Analytics for Firebase data

- ✓ Share your Analytics data with all Firebase features
- ✓ Share your Analytics data with Google to improve Google Products and Services
- ✓ Share your Analytics data with Google to enable technical support
- ✓ Share your Analytics data with Google to enable Benchmarking
- ✓ Share your Analytics data with Google Account Specialists

✓ I accept the controller-controller terms. This is required when sharing Analytics data to improve Google Products and Services. Learn more

Firebase Setup

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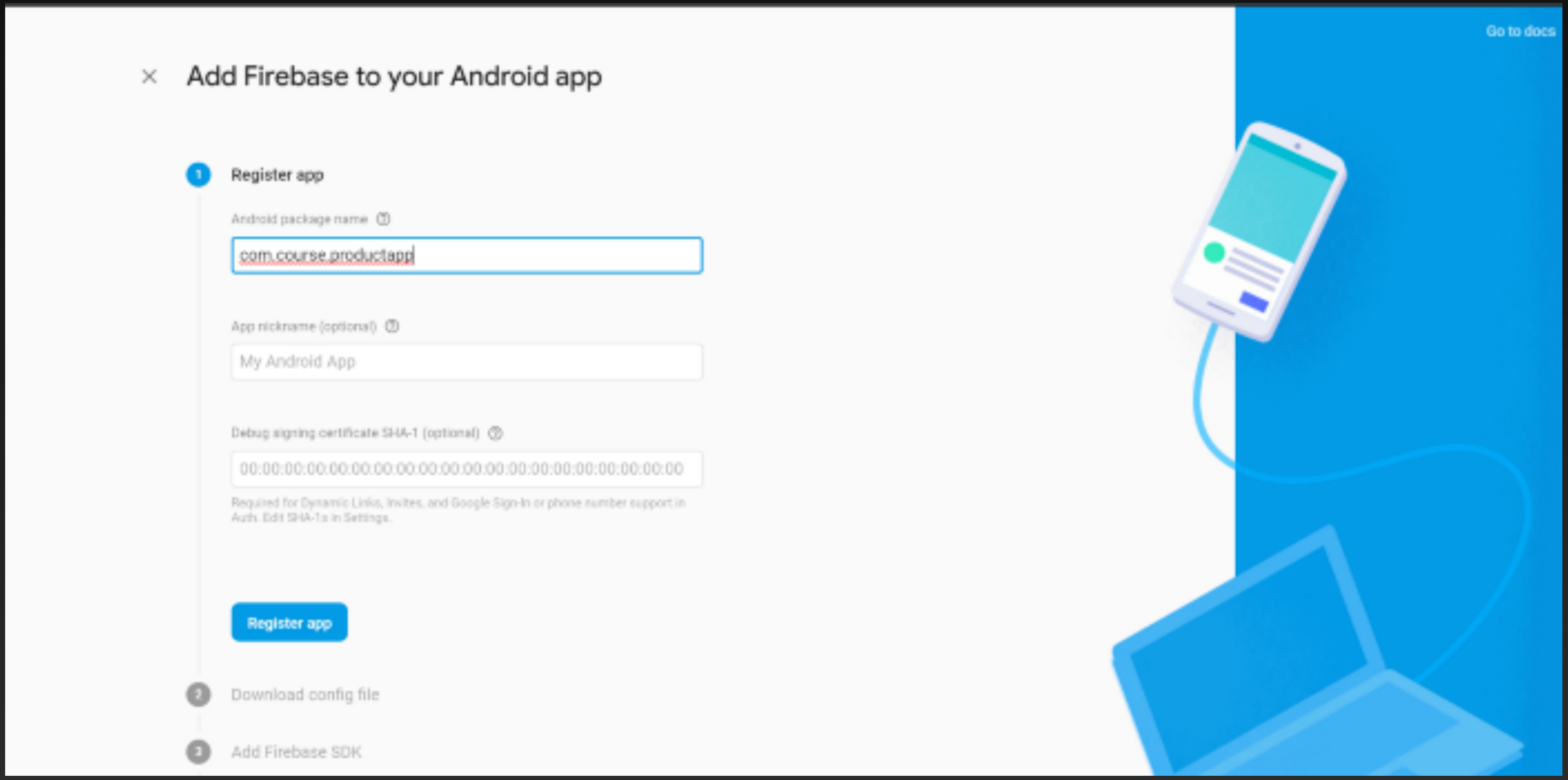
Android setup:

Once the project is created, go to the Firebase Console and register your app by clicking Add Firebase to your app Android. Enter your AppID.



Add Firebase to your Android app

1 Register app

Android package name: com.course.productapp

App nickname (optional): My Android App

Debug signing certificate SHA-1 (optional): 00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00

Required for Dynamic Links, Invites, and Google Sign-In or phone number support in Auth. Edit SHA-1s in Settings.

Firebase Setup

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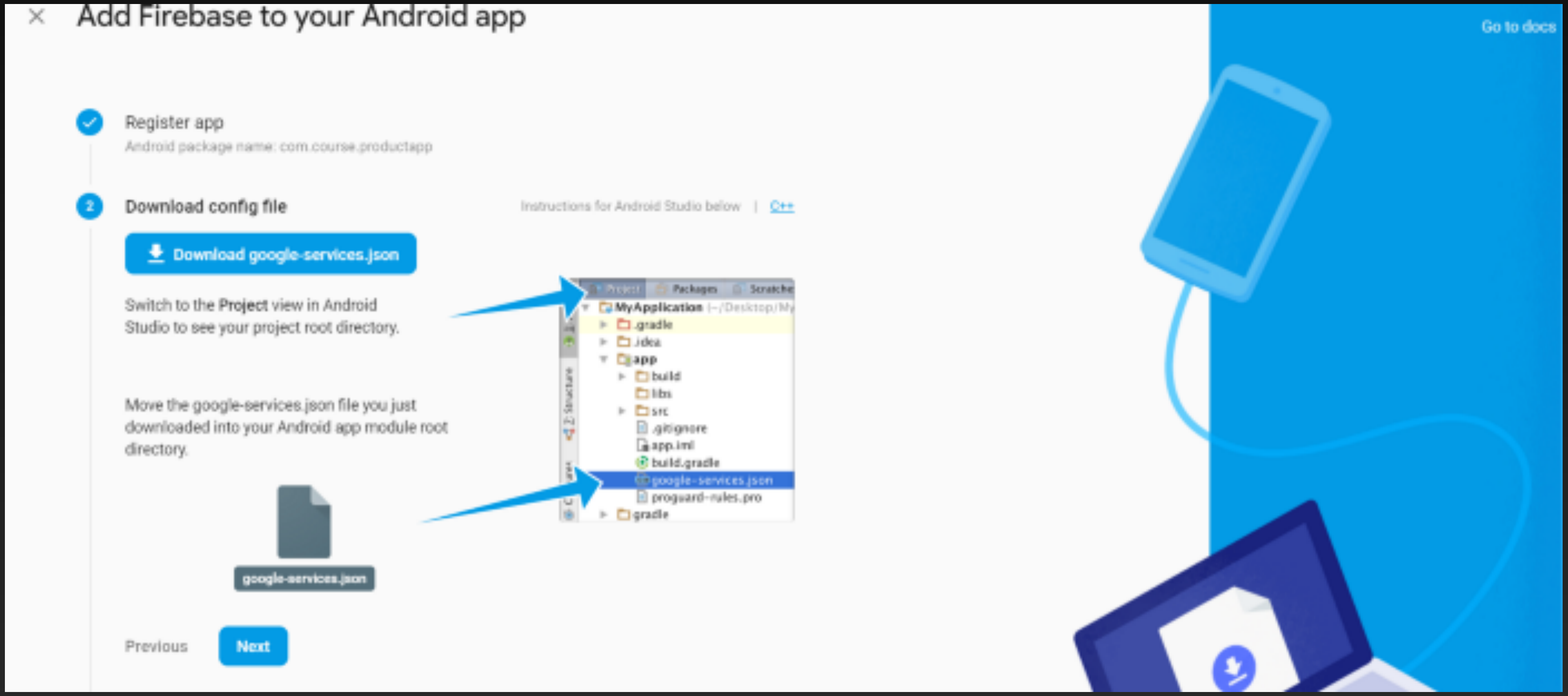
Android setup:

Download the *google-services.json* file to the **android/app** directory



Add Firebase to your Android app

Register app

Android package name: com.course.productapp

Download config file

Switch to the Project view in Android Studio to see your project root directory.

Move the google-services.json file you just downloaded into your Android app module root directory.

Firebase Setup

Firebase 2021

Android setup:

Now we need to register our Google services in the Gradle build files under android/build.gradle

Android project/build.gradle

```
buildscript {
   dependencies {
       // ...
       classpath 'com.google.gms:google-services:4.2.0'   // <--
here
   }
}
```

App/build.gradle

```
defaultConfig {
        applicationId "com.course.product" // <-- update this line
        minSdkVersion 21 // <-- you might also need to change this
to 21
        // ...
    }

// ... bottom of file
apply plugin: 'com.google.gms.google-services' // <-- add
```

Firebase Setup

Firebase 2021

iOS setup:

You need a MacBook or iMac. If you don't, just skip this.

The iOS setup is easier and can be completed in one step.

In your firebase project, Click add your iOS app then download the ***GoogleService-Info.plist*** file into the **iOS/Runner/** from Xcode (**Make sure to use Xcode,** Xcode will generate a runner-bridging-header).

Flutter Setup

Firebase 2021

Plugins:

1. **firebase_core**
   Enabling basic functions and connecting to Firebase
2. **cloud_fireStore**
   Using Firebase/fireStore API
3. **firebase_auth**
   For Authentication purposes
4. **google_signing**
   For Additional Google Signing Authentications
5. **provider**
   Flutter State management, If we need to pass down values to other inherited widgets

Firebase Setup

Firebase 2021

In your Flutter Project:

1. Add Dependencies

```
dependencies:
  flutter:
    sdk: flutter

  cloud_firestore:
  firebase_core :
```

2. Import & Initialise your firebase in main( )

```
import 'package:cloud_firestore/cloud_firestore.dart';
import 'package:firebase_core/firebase_core.dart';
```

```
void main() async {
  WidgetsFlutterBinding.ensureInitialized();
  await Firebase.initializeApp();
  runApp(MyApp());
}
```

Firebase Setup

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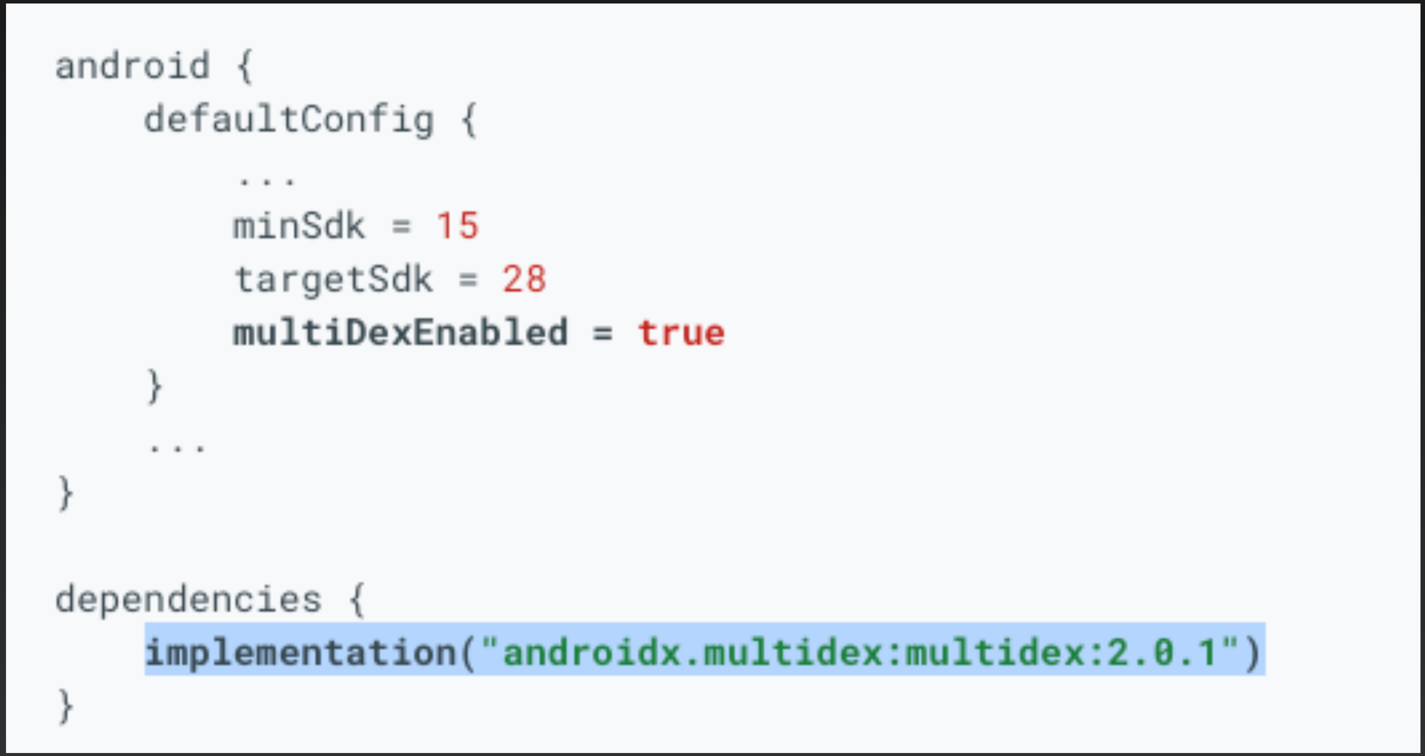
If Error in Android compilation, Project Gradle

1. Add minSdk 19 (or Whatever Google requirement)
2. Add multiDex support



```
android {
    defaultConfig {
        ...
        minSdk = 15
        targetSdk = 28
        multiDexEnabled = true
    }
    ...
}

dependencies {
    implementation("androidx.multidex:multidex:2.0.1")
}
```

Note: If your minSdkVersion is set to 21 or higher, multidex is enabled by default and you do not need the multidex library.

However, if your minSdkVersion is set to 20 or lower, then you must use the multidex library and make the following modifications to your app project:

Create Data

Firebase 2021

Use:

```
void _create() async {
  try {
    await firestore.collection('users').doc('testUser').set({
      'firstName': 'John',
      'lastName': 'Peter',
    });
  } catch (e) {
    print(e);
  }
}
```

Update Data

Firebase 2021

Use:

```
void _update() async {
  try {
    firestore.collection('users').doc('testUser').update({
      'firstName': 'Alan',
    });
  } catch (e) {
    print(e);
  }
}
```

Read Data

Firebase 2021

Use:

```
void _read() async {
  DocumentSnapshot documentSnapshot;
  try {
    documentSnapshot = await
firestore.collection('users').doc('testUser').get();
    print(documentSnapshot.data());
  } catch (e) {
    print(e);
  }
}
```

Delete Data

Firebase 2021

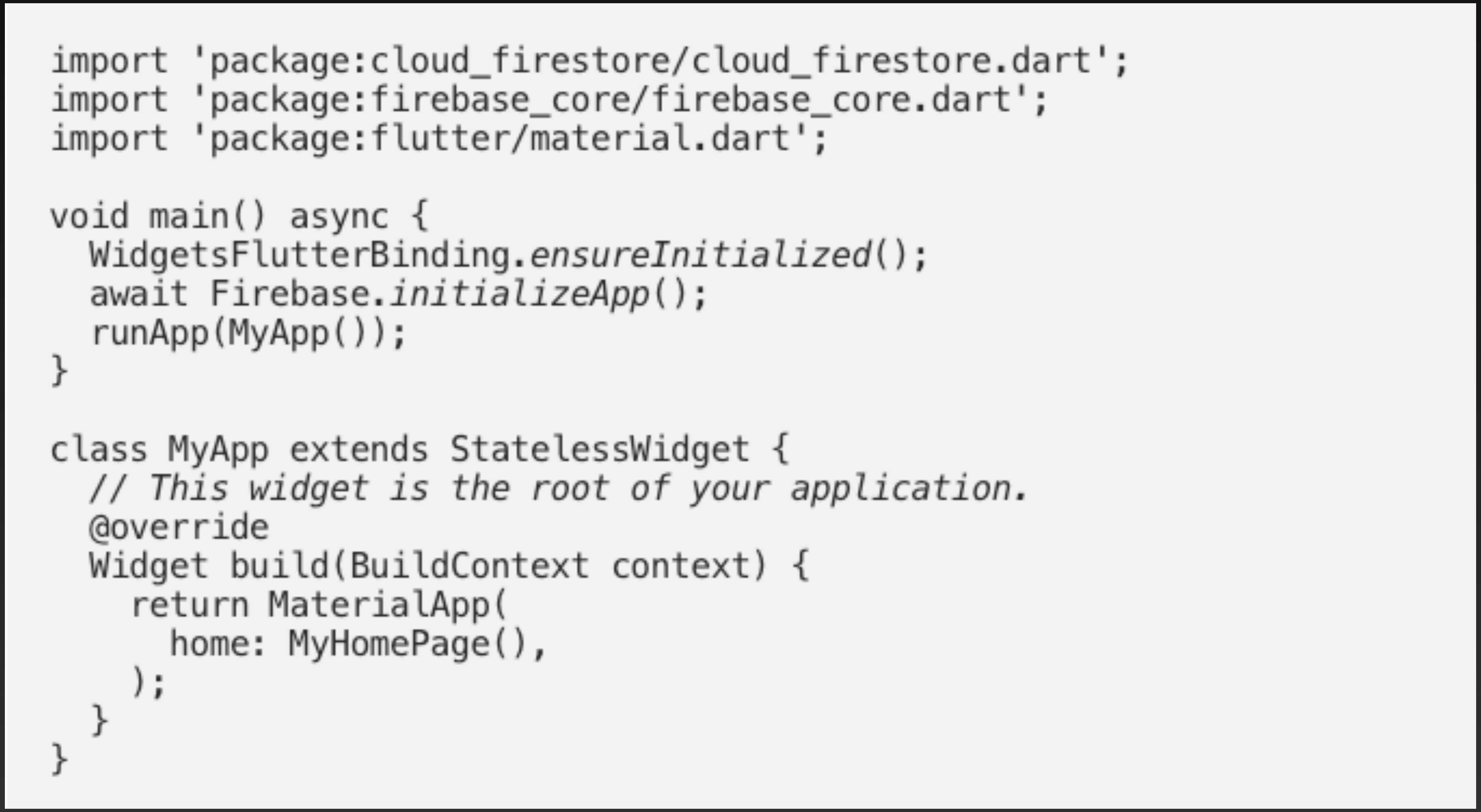
Use:

```
void _delete() async {
  try {
    firestore.collection('users').doc('testUser').delete();
  } catch (e) {
    print(e);
  }
}
```

A Simple Firebase App

Firebase 2021

Step 1: Initialize Firebase

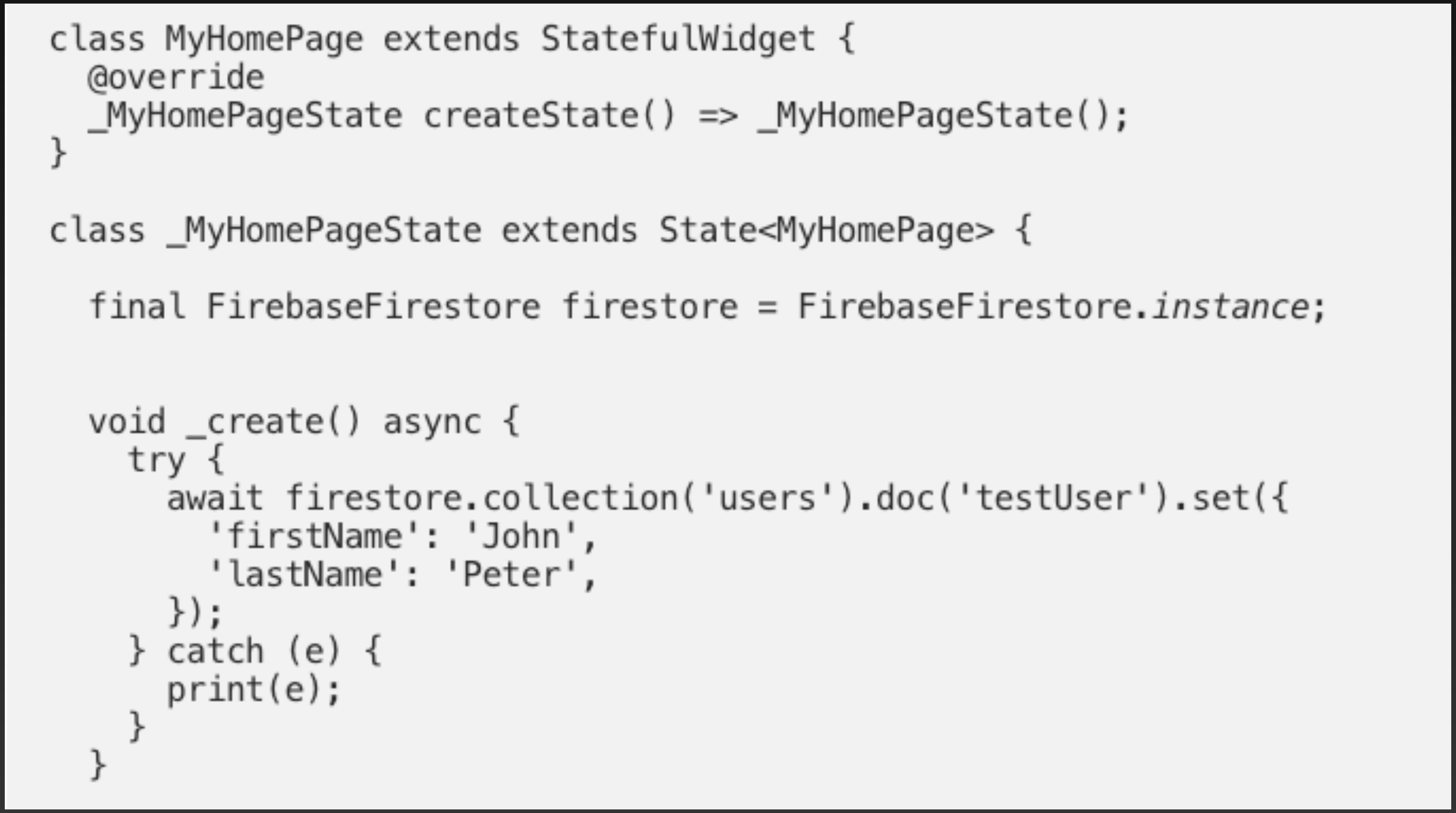


```dart
import 'package:cloud_firestore/cloud_firestore.dart';
import 'package:firebase_core/firebase_core.dart';
import 'package:flutter/material.dart';

void main() async {
  WidgetsFlutterBinding.ensureInitialized();
  await Firebase.initializeApp();
  runApp(MyApp());
}

class MyApp extends StatelessWidget {
  // This widget is the root of your application.
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: MyHomePage(),
    );
  }
}
```

A Simple Firebase App

Firebase 2021

Step 2: Create a Firebase Instance & Associated Functions (Create, Read, Update, Delete)

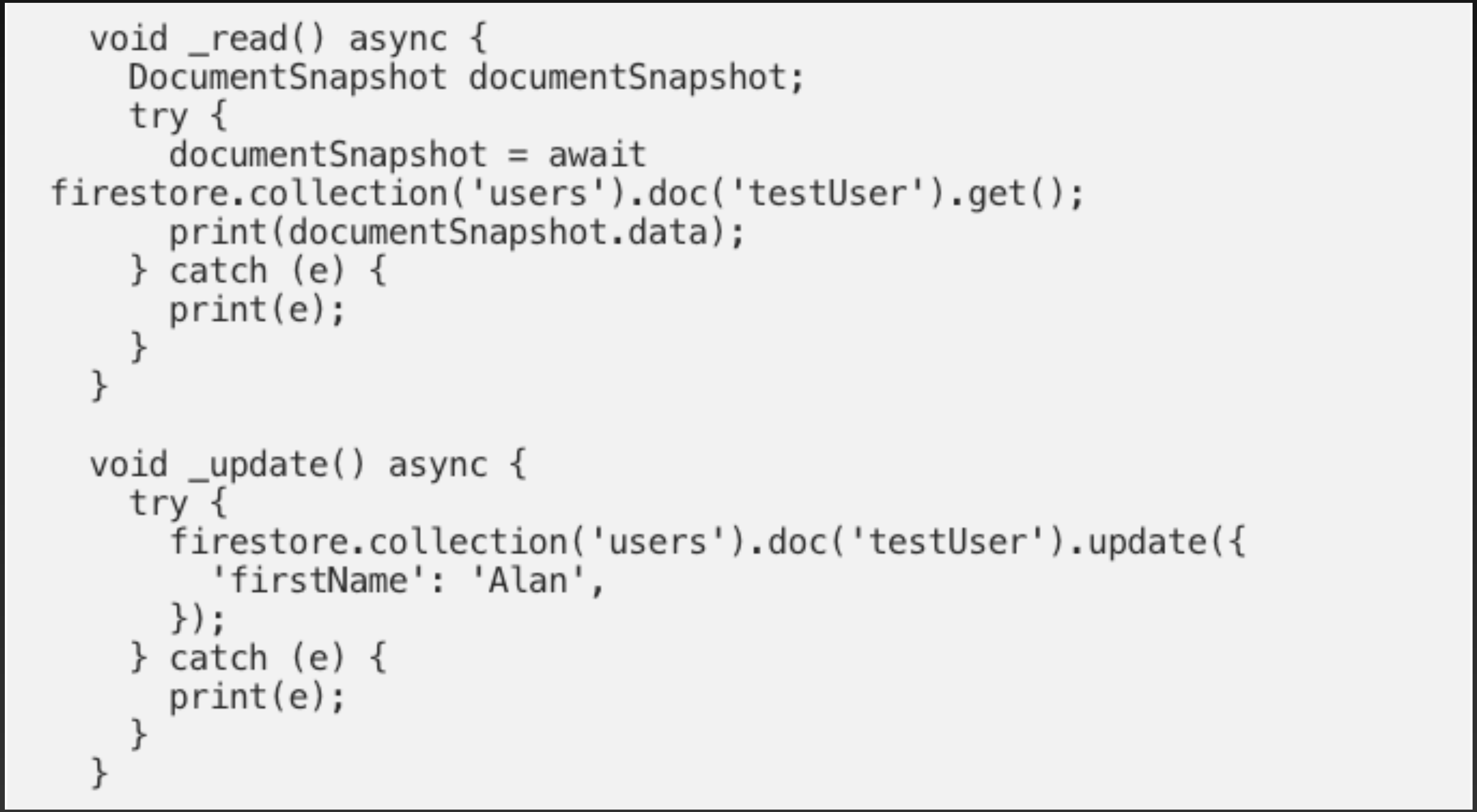


```
class MyHomePage extends StatefulWidget {
  @override
  _MyHomePageState createState() => _MyHomePageState();
}

class _MyHomePageState extends State<MyHomePage> {

  final FirebaseFirestore firestore = FirebaseFirestore.instance;


  void _create() async {
    try {
      await firestore.collection('users').doc('testUser').set({
        'firstName': 'John',
        'lastName': 'Peter',
      });
    } catch (e) {
      print(e);
    }
  }
```

A Simple Firebase App

Firebase 2021

Step 2: Create a Firebase Instance & Associated Functions (Create, Read, Update, Delete)

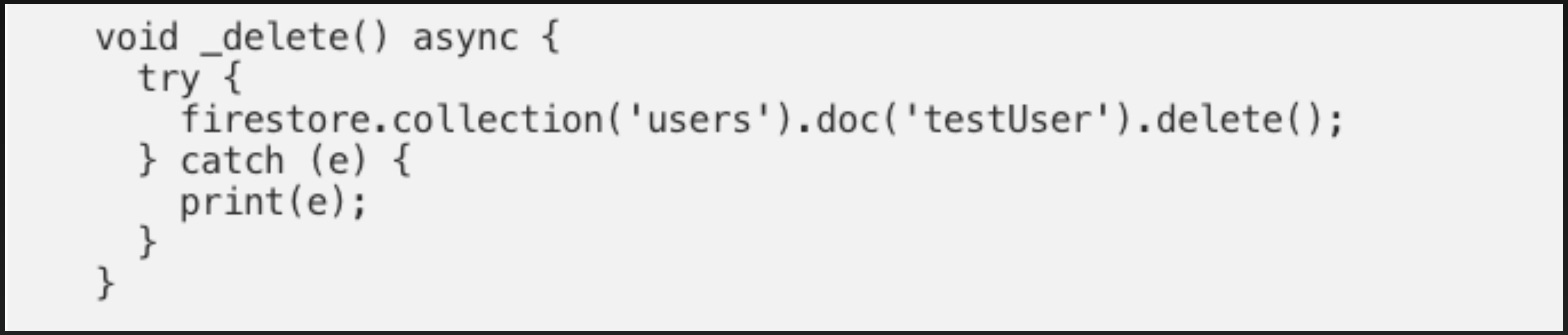


```
  void _read() async {
    DocumentSnapshot documentSnapshot;
    try {
      documentSnapshot = await
firestore.collection('users').doc('testUser').get();
      print(documentSnapshot.data);
    } catch (e) {
      print(e);
    }
  }

  void _update() async {
    try {
      firestore.collection('users').doc('testUser').update({
        'firstName': 'Alan',
      });
    } catch (e) {
      print(e);
    }
  }
```

A Simple Firebase App

Firebase 2021

Step 2: Create a Firebase Instance & Associated Functions (Create, Read, Update, Delete)



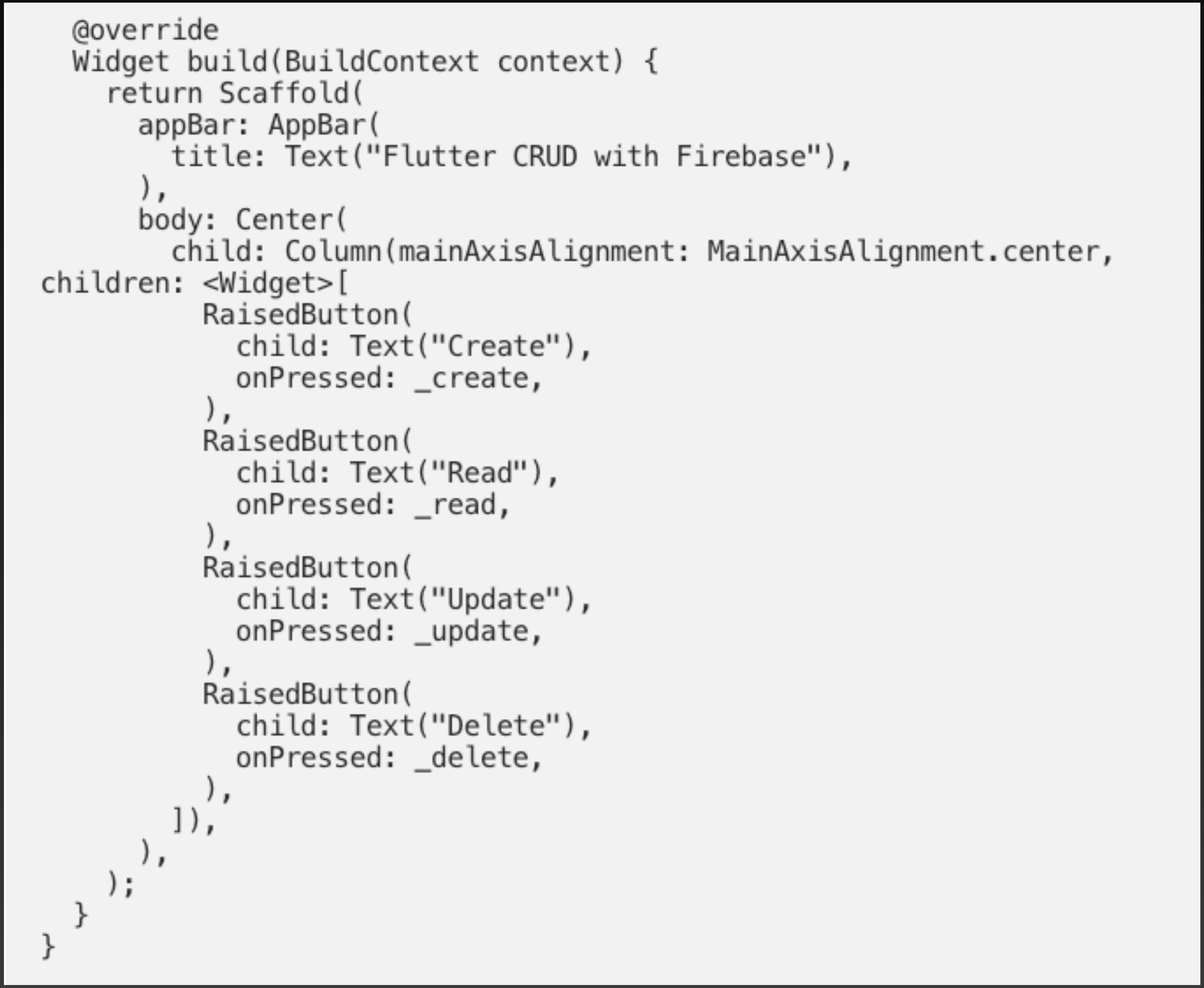
```
void _delete() async {
  try {
    firestore.collection('users').doc('testUser').delete();
  } catch (e) {
    print(e);
  }
}
```

A Simple Firebase App

Firebase 2021

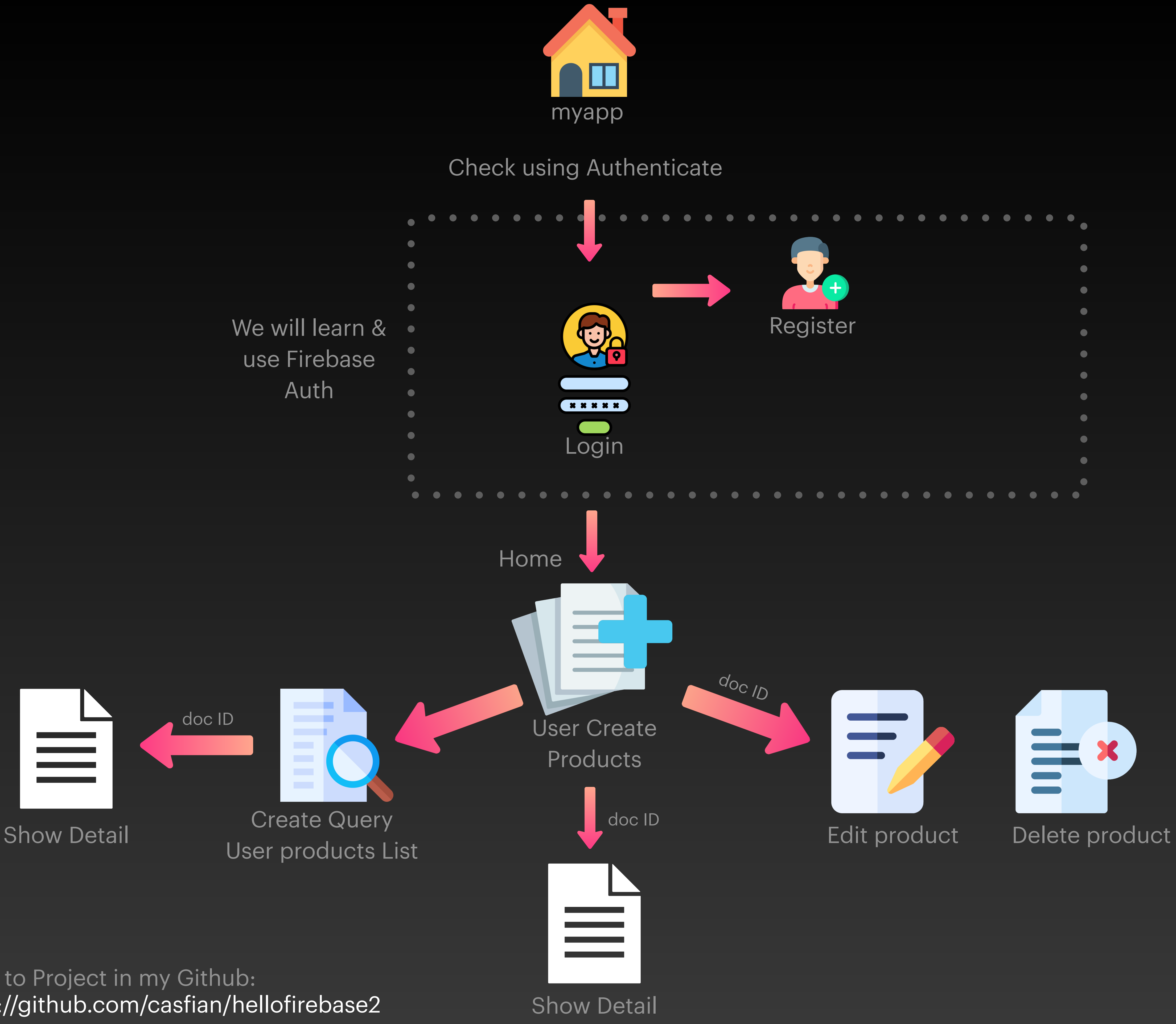
Step 4: Create Buttons to run those Functions

(Create, Read, Update, Delete)



```
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text("Flutter CRUD with Firebase"),
      ),
      body: Center(
        child: Column(mainAxisAlignment: MainAxisAlignment.center,
children: <Widget>[
          RaisedButton(
            child: Text("Create"),
            onPressed: _create,
          ),
          RaisedButton(
            child: Text("Read"),
            onPressed: _read,
          ),
          RaisedButton(
            child: Text("Update"),
            onPressed: _update,
          ),
          RaisedButton(
            child: Text("Delete"),
            onPressed: _delete,
          ),
        ]),
      ),
    );
  }
}
```

Let’s Do a Real Project



Refer to Project in my Github:
https://github.com/casfian/hellofirebase2

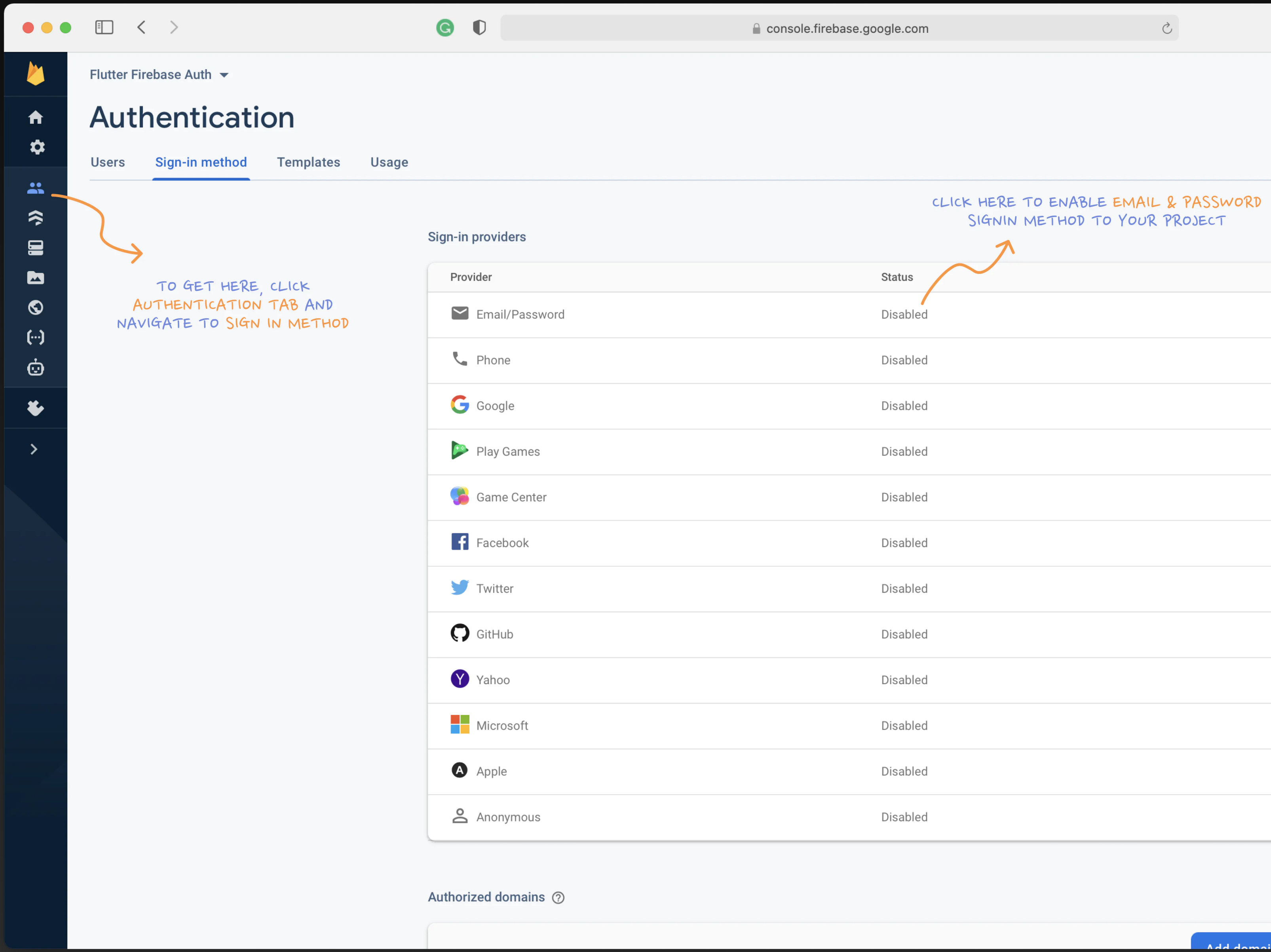
Firebase Auth

Firebase Auth

Firebase 2021

Step 1:

Open the Authentication tab from project home and navigate to the sign-in method. You can find many sign-in options, but we are only using email and password in our app.


console.firebase.google.com
Flutter Firebase Auth
Authentication
Users
Sign-in method
Templates
Usage
TO GET HERE, CLICK AUTHENTICATION TAB AND NAVIGATE TO SIGN IN METHOD
CLICK HERE TO ENABLE EMAIL & PASSWORD SIGNIN METHOD TO YOUR PROJECT
Sign-in providers
Authorized domains

Provider	Status
Email/Password	Disabled
Phone	Disabled
Google	Disabled
Play Games	Disabled
Game Center	Disabled
Facebook	Disabled
Twitter	Disabled
GitHub	Disabled
Yahoo	Disabled
Microsoft	Disabled
Apple	Disabled
Anonymous	Disabled

Firebase Auth

Creating Authentication Functions

Step 1: Create an authentication.dart file (Service file) in lib folder.
Why create a service file? Easier to call functions if you doing a big project and it's reusable in other projects.

This Authentication Service is a class that has different methods that handle Firebase Authentication.

Create **AuthenticationService** class first, then add these functions

1. **_firebaseAuth** is a variable of type FirebaseAuth
2. **The streamProvider** returns a User class if the user is signed in or null if they are not.
3. **signUp()** accepts email and password for firebase sign up and returns a Future String
4. **signIn()** accepts email and password for firebase sign in and returns a Future String
5. **signOut()** is a simple method. On calling, it sign out the user and returns a Future String.
6. **getUser()** returns the current logged-in user details.

In all the methods, if an exception occurs is handled under FirebaseAuthException.

Firebase Auth

Creating StreamProvider Getter

Create a StreamProvider Getter so that we can use in our App. This is useful For Provider so that we can pass the Getter data in our widgets.

Create Auth variable Instance and constructor

```
final FirebaseAuth firebaseAuth;
//FirebaseAuth instance
AuthenticationProvider(this.firebaseAuth);
//Constuctor to initalize the FirebaseAuth instance
```

Firebase Auth

Creating GetUser Function

Create getter where it returns the current user when there’s a change in the Auth IDToken.
Using Stream because the data should always be flowing in or always in the state of change

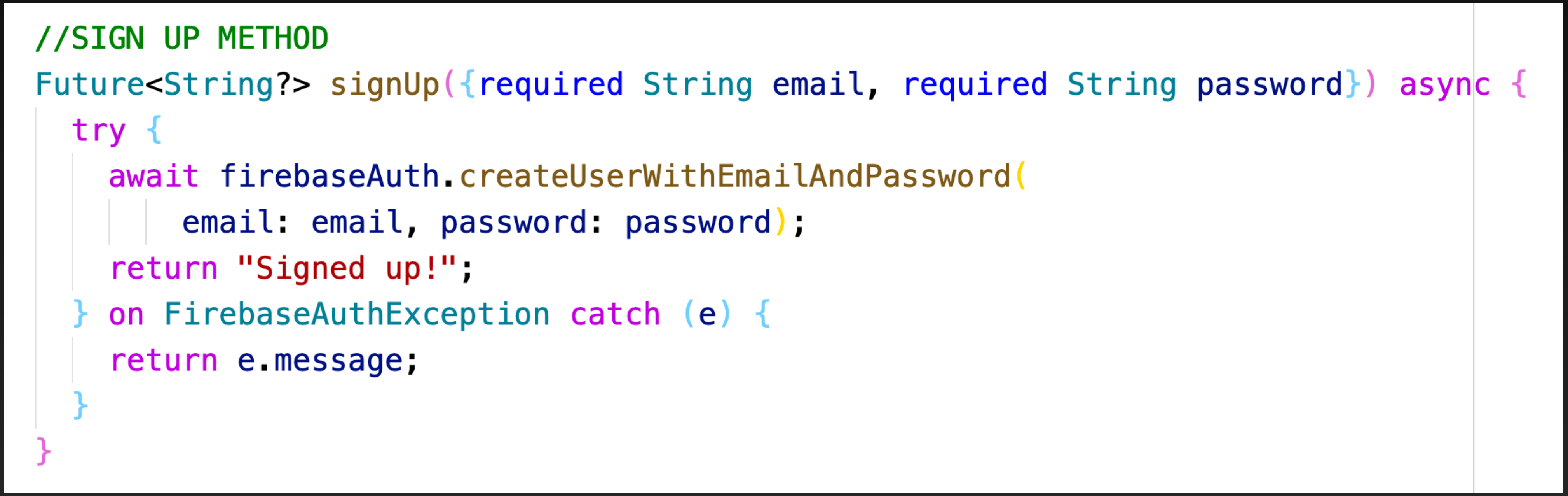
```
//Using Stream to listen to Authentication State
Stream<User?> get authState => firebaseAuth.idTokenChanges();
```

Note: refer Stream as a stream of events flowing.

Firebase Auth

Creating SignUp Function

Create an email based **SignUp** function. Function return a String but you can also use a Boolean

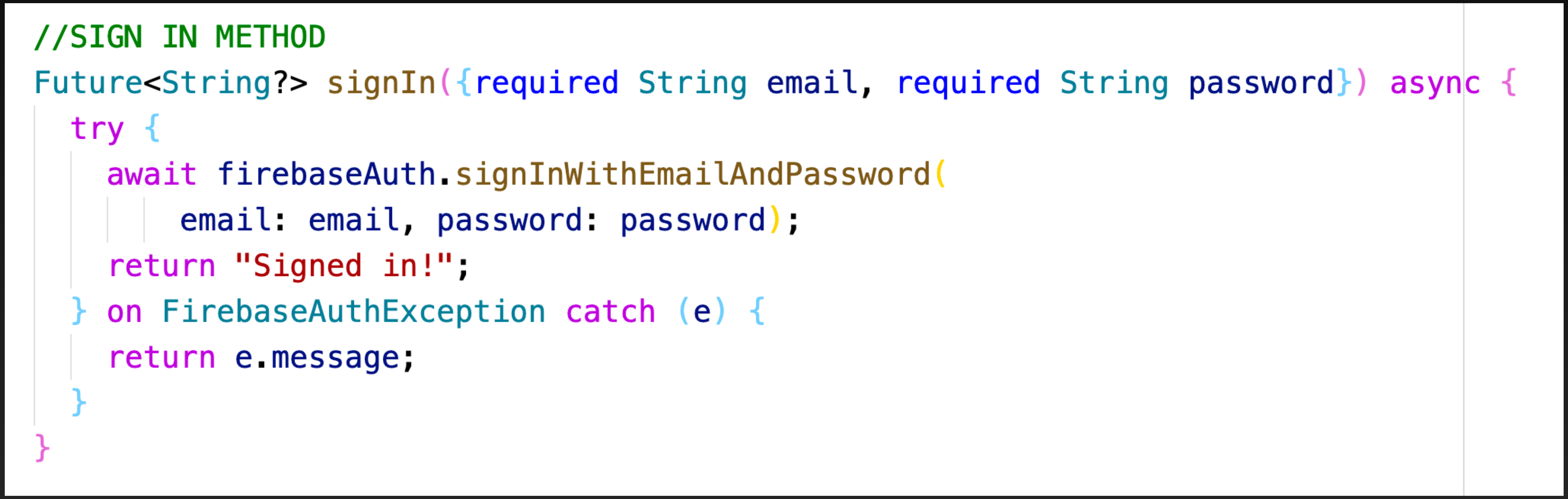


```dart
//SIGN UP METHOD
Future<String?> signUp({required String email, required String password}) async {
  try {
    await firebaseAuth.createUserWithEmailAndPassword(
        email: email, password: password);
    return "Signed up!";
  } on FirebaseAuthException catch (e) {
    return e.message;
  }
}
```

Firebase Auth

Creating SignIn Function

Create an email based **SignIn** function. Function return a String but you can also use a Boolean.

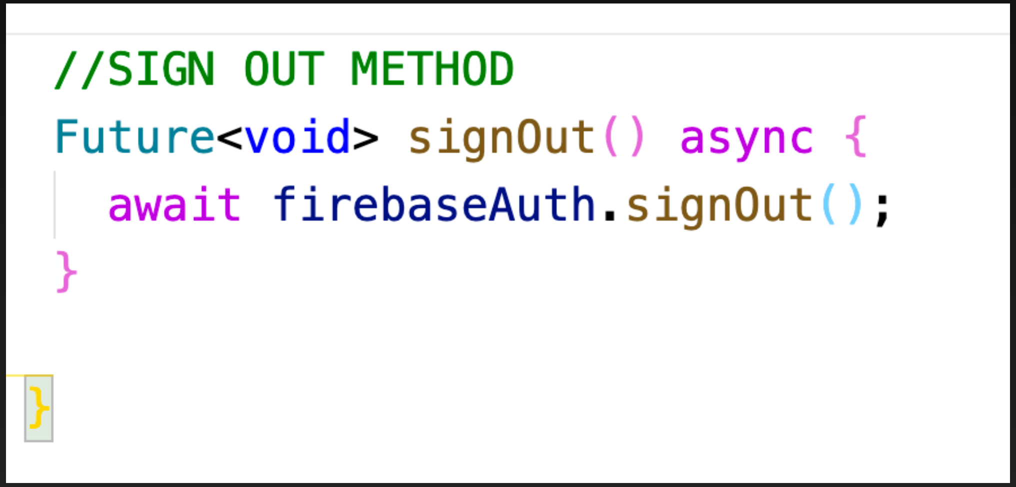


```
//SIGN IN METHOD
Future<String?> signIn({required String email, required String password}) async {
  try {
    await firebaseAuth.signInWithEmailAndPassword(
        email: email, password: password);
    return "Signed in!";
  } on FirebaseAuthException catch (e) {
    return e.message;
  }
}
```

Firebase Auth

Creating SignOut Function

Create a SignOut function.

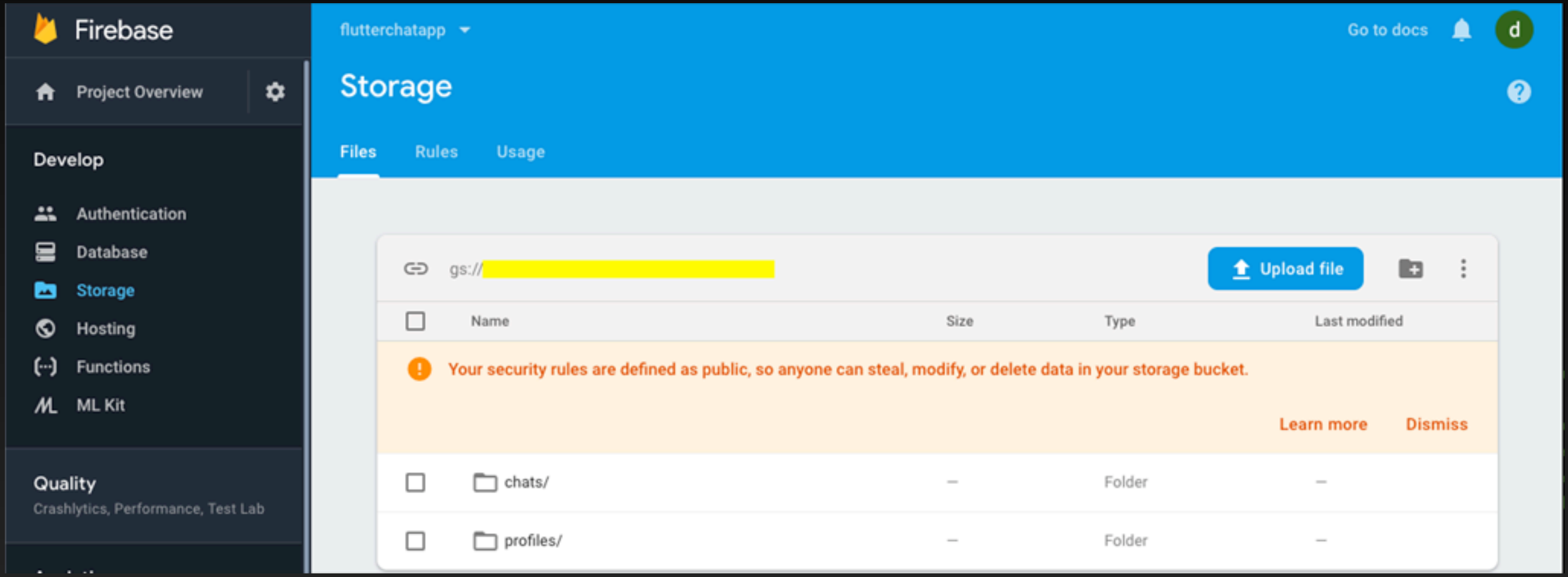


```
//SIGN OUT METHOD
Future<void> signOut() async {
  await firebaseAuth.signOut();
}


}
```

Firebase Storage

Firebase Storage

Setup



gs://[redacted]

Your security rules are defined as public, so anyone can steal, modify, or delete data in your storage bucket.

Name	Size	Type	Last modified
chats/	–	Folder	–
profiles/	–	Folder	–

You'll need **firebase_storage** package dependency. Goto pub.dev and install it in your Flutter Project.

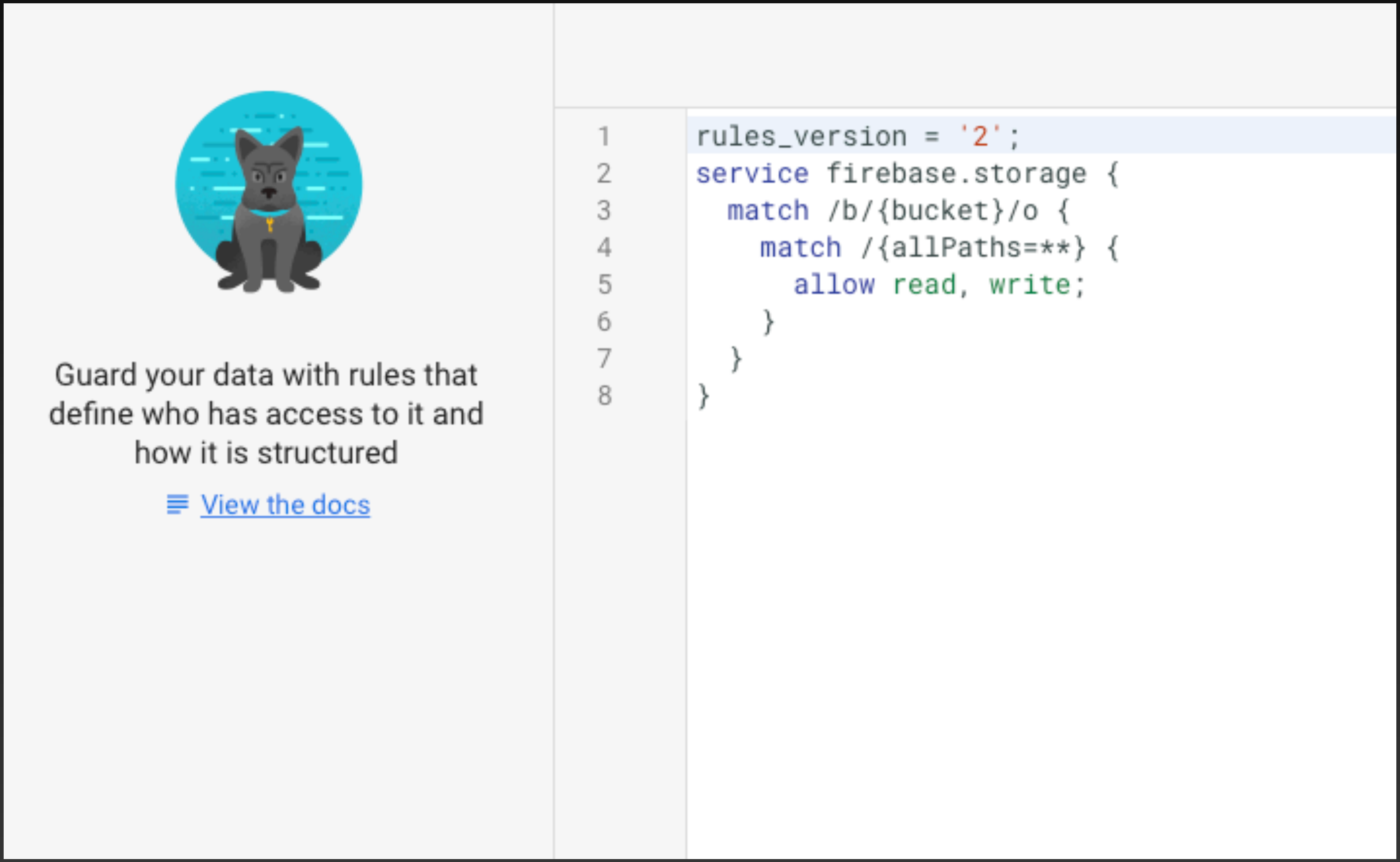
Make sure security rule to allow read and write access.

More info: **https://firebase.flutter.dev/docs/storage/overview/** and
https://firebase.flutter.dev/docs/storage/usage

Firebase Storage

Storage Rule

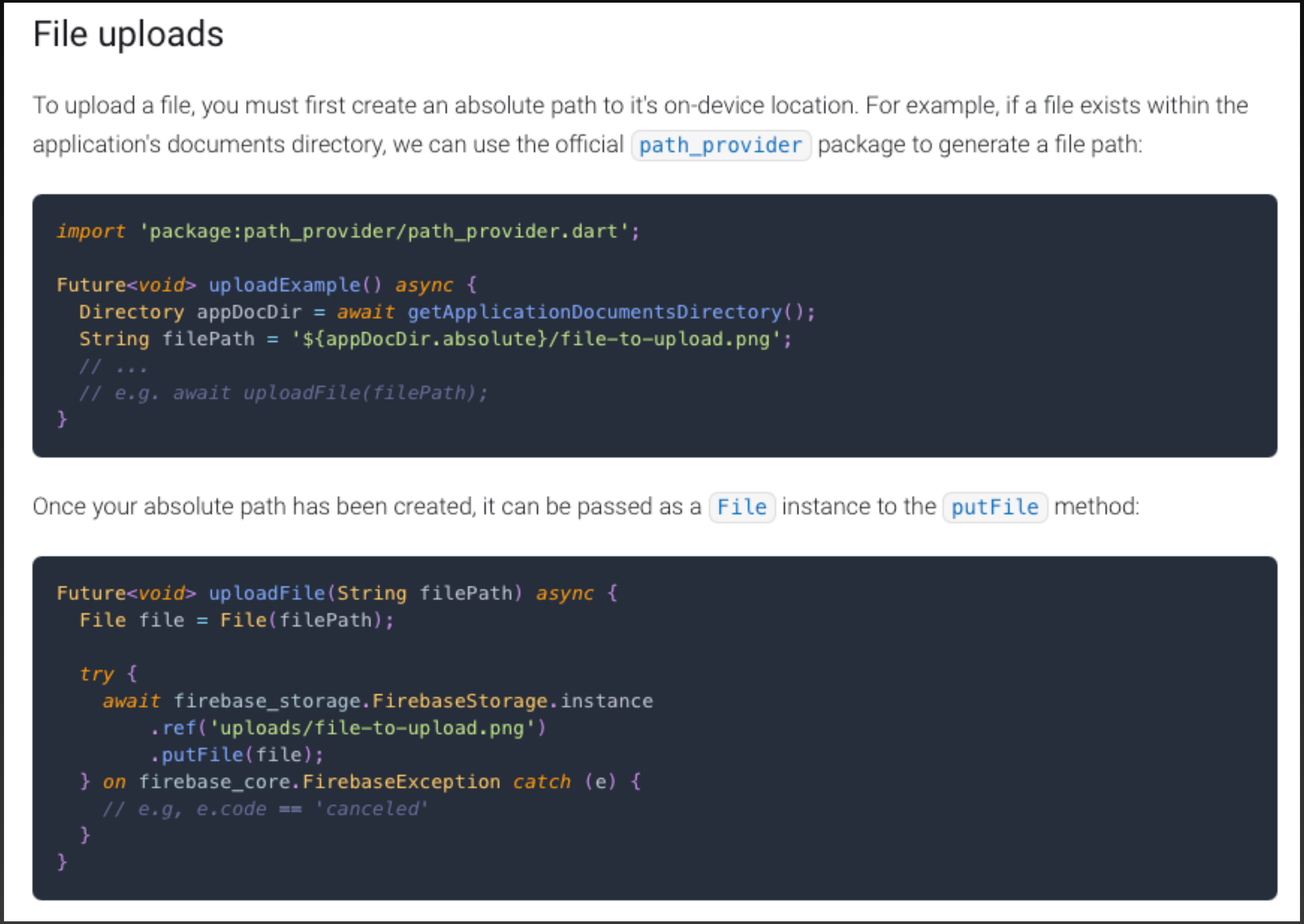
You can change the rule later with access authorization


Guard your data with rules that define who has access to it and how it is structured
View the docs

```
rules_version = '2';
service firebase.storage {
  match /b/{bucket}/o {
    match /{allPaths=**} {
      allow read, write;
    }
  }
}
```

Firebase Storage

Upload Files in Firebase



File uploads

To upload a file, you must first create an absolute path to it's on-device location. For example, if a file exists within the application's documents directory, we can use the official `path_provider` package to generate a file path:

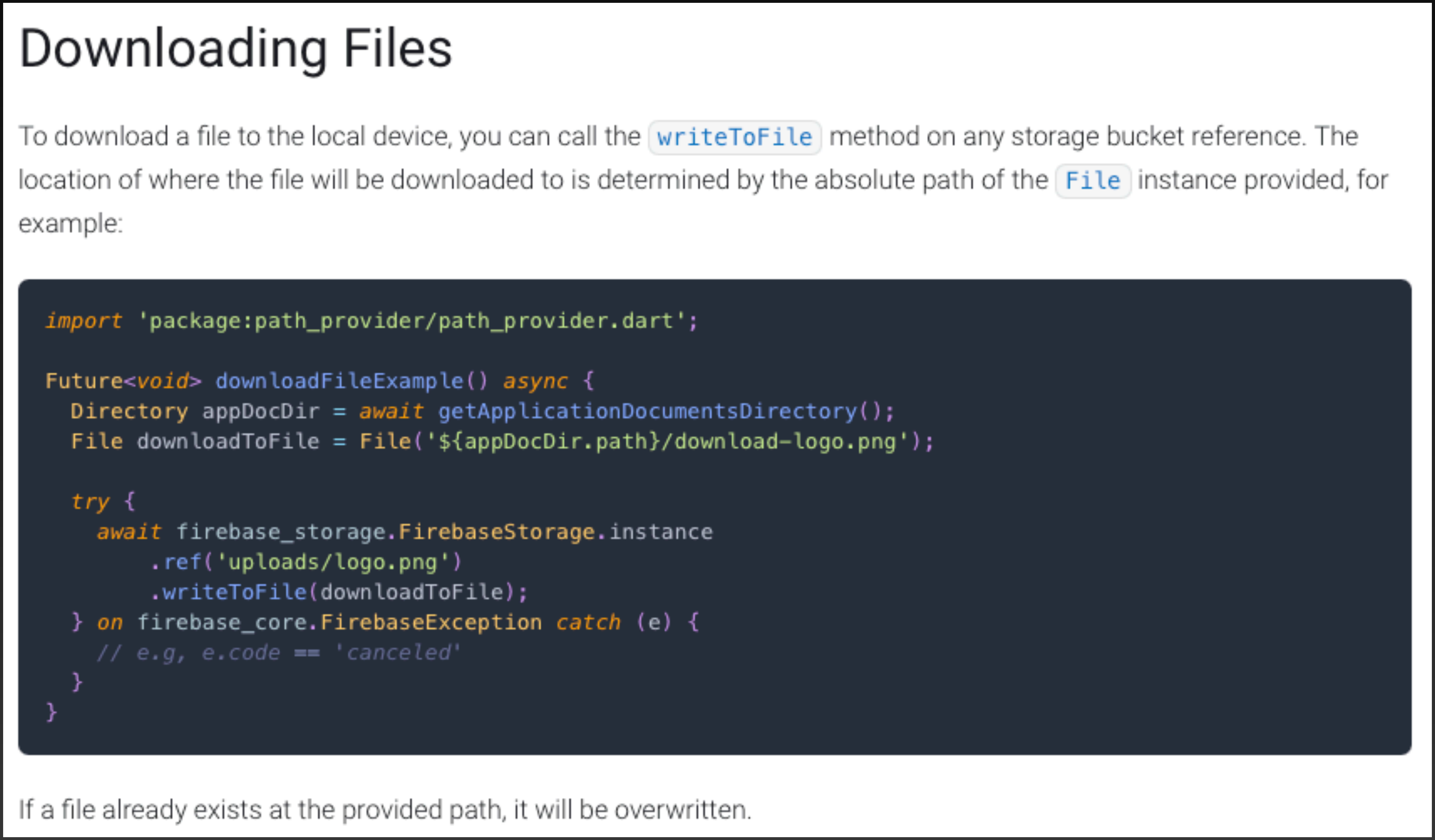
```dart
import 'package:path_provider/path_provider.dart';

Future<void> uploadExample() async {
  Directory appDocDir = await getApplicationDocumentsDirectory();
  String filePath = '${appDocDir.absolute}/file-to-upload.png';
  // ...
  // e.g. await uploadFile(filePath);
}
```

Once your absolute path has been created, it can be passed as a `File` instance to the `putFile` method:

```dart
Future<void> uploadFile(String filePath) async {
  File file = File(filePath);

  try {
    await firebase_storage.FirebaseStorage.instance
        .ref('uploads/file-to-upload.png')
        .putFile(file);
  } on firebase_core.FirebaseException catch (e) {
    // e.g, e.code == 'canceled'
  }
}
```

Firebase Storage

Download Files in Firebase



Downloading Files

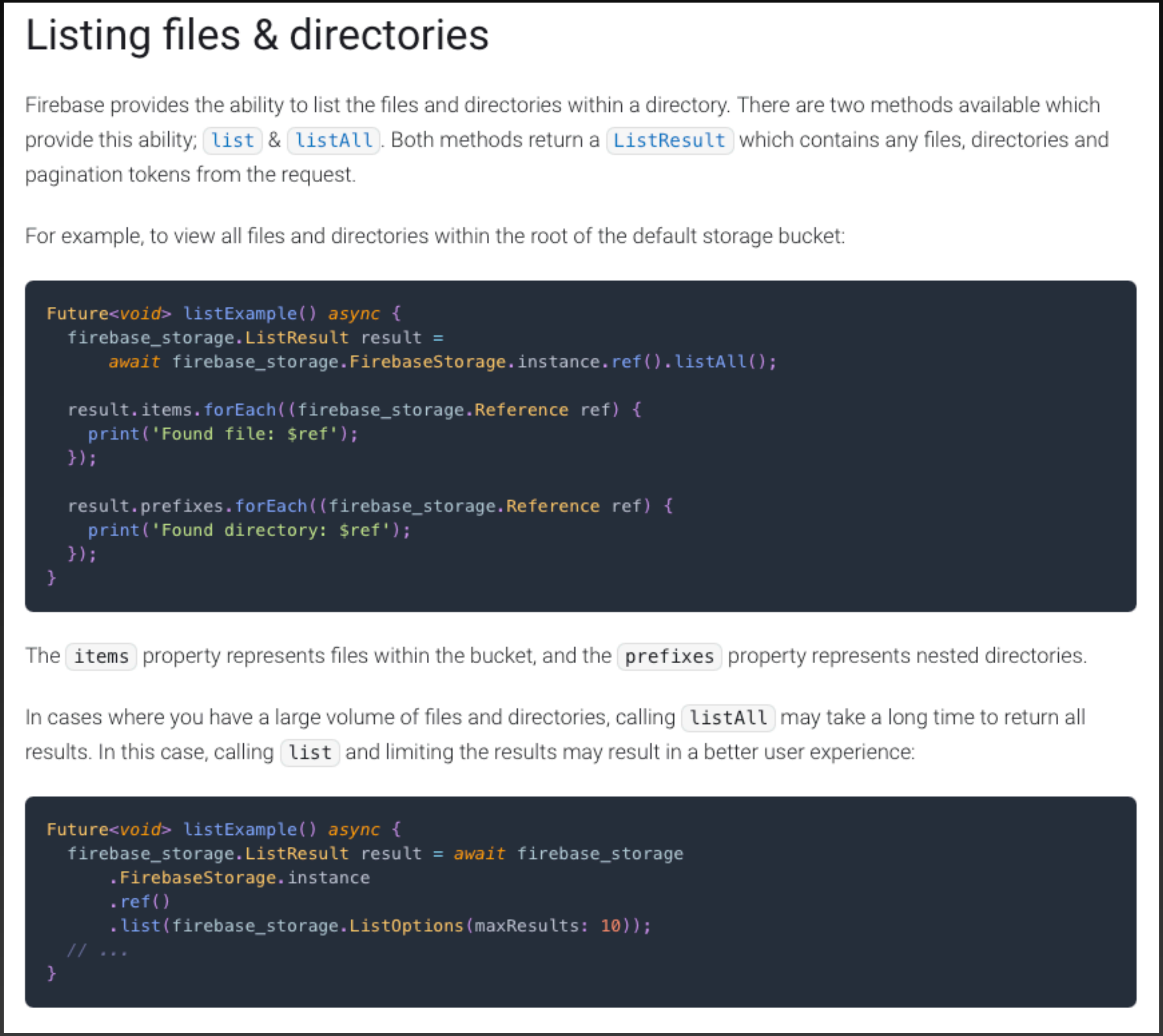
To download a file to the local device, you can call the `writeToFile` method on any storage bucket reference. The location of where the file will be downloaded to is determined by the absolute path of the `File` instance provided, for example:

```dart
import 'package:path_provider/path_provider.dart';

Future<void> downloadFileExample() async {
  Directory appDocDir = await getApplicationDocumentsDirectory();
  File downloadToFile = File('${appDocDir.path}/download-logo.png');

  try {
    await firebase_storage.FirebaseStorage.instance
        .ref('uploads/logo.png')
        .writeToFile(downloadToFile);
  } on firebase_core.FirebaseException catch (e) {
    // e.g, e.code == 'canceled'
  }
}
```

If a file already exists at the provided path, it will be overwritten.

Firebase Storage

Listing Files in Firebase



Listing files & directories

Firebase provides the ability to list the files and directories within a directory. There are two methods available which provide this ability; `list` & `listAll`. Both methods return a `ListResult` which contains any files, directories and pagination tokens from the request.

For example, to view all files and directories within the root of the default storage bucket:

```
Future<void> listExample() async {
  firebase_storage.ListResult result =
      await firebase_storage.FirebaseStorage.instance.ref().listAll();

  result.items.forEach((firebase_storage.Reference ref) {
    print('Found file: $ref');
  });

  result.prefixes.forEach((firebase_storage.Reference ref) {
    print('Found directory: $ref');
  });
}
```

The `items` property represents files within the bucket, and the `prefixes` property represents nested directories.

In cases where you have a large volume of files and directories, calling `listAll` may take a long time to return all results. In this case, calling `list` and limiting the results may result in a better user experience:

```
Future<void> listExample() async {
  firebase_storage.ListResult result = await firebase_storage
      .FirebaseStorage.instance
      .ref()
      .list(firebase_storage.ListOptions(maxResults: 10));
  // ...
}
```