EXPERIMENT NO: - 06

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AIM: - To connect Flutter UI with Firebase database.

Theory: -

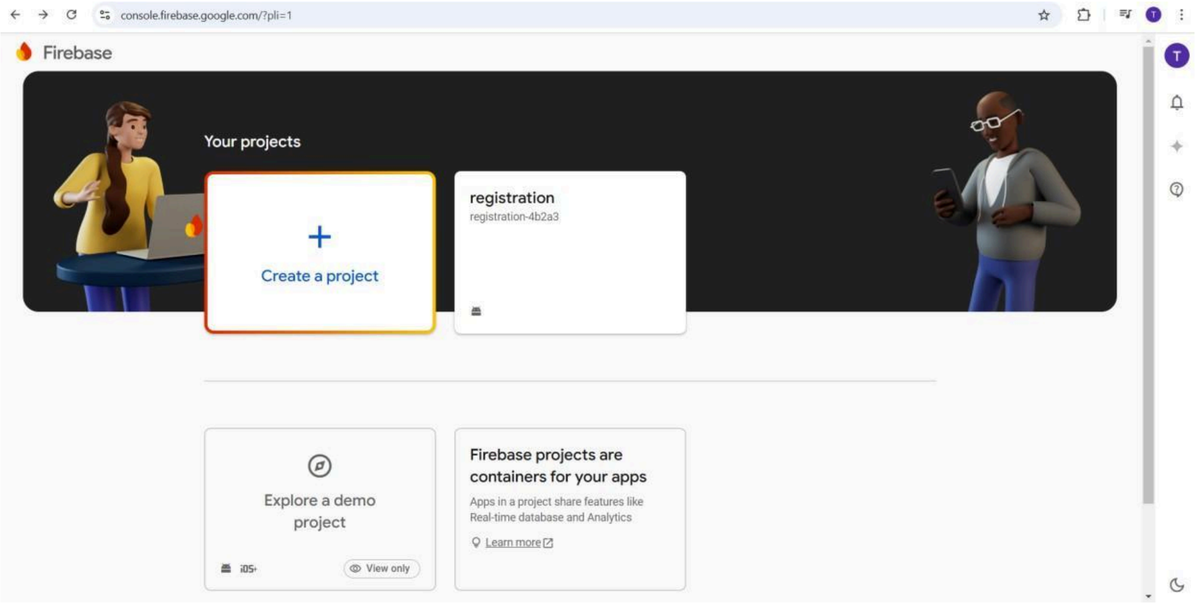
Flutter is an open-source UI toolkit developed by Google for building natively compiled applications for mobile, web, and desktop from a single codebase. Firebase, a Backend-as-a-Service (BaaS) platform, provides real-time database, authentication, and cloud storage services, making it a powerful backend solution for Flutter applications.

By integrating Firebase with Flutter, developers can store and retrieve data in real time, authenticate users, and manage cloud-based data efficiently. This is particularly useful for applications requiring dynamic content updates and user interactions.

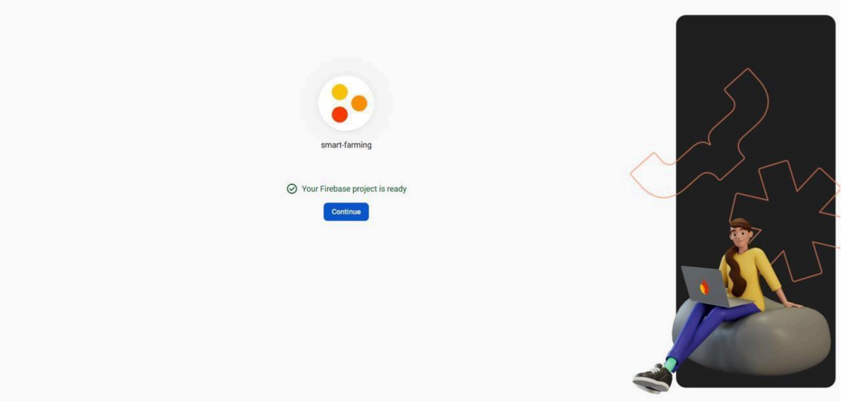
Steps to Connect Flutter UI with Firebase Database

Step 1:

1.1) Go to Firebase Console and Create a Firebase Project


console.firebase.google.com/?pli=1
Firebase
Your projects
Create a project
registration
registration-4b2a3
Explore a demo project
iOS+
View only
Firebase projects are containers for your apps
Apps in a project share features like Real-time database and Analytics
Learn more

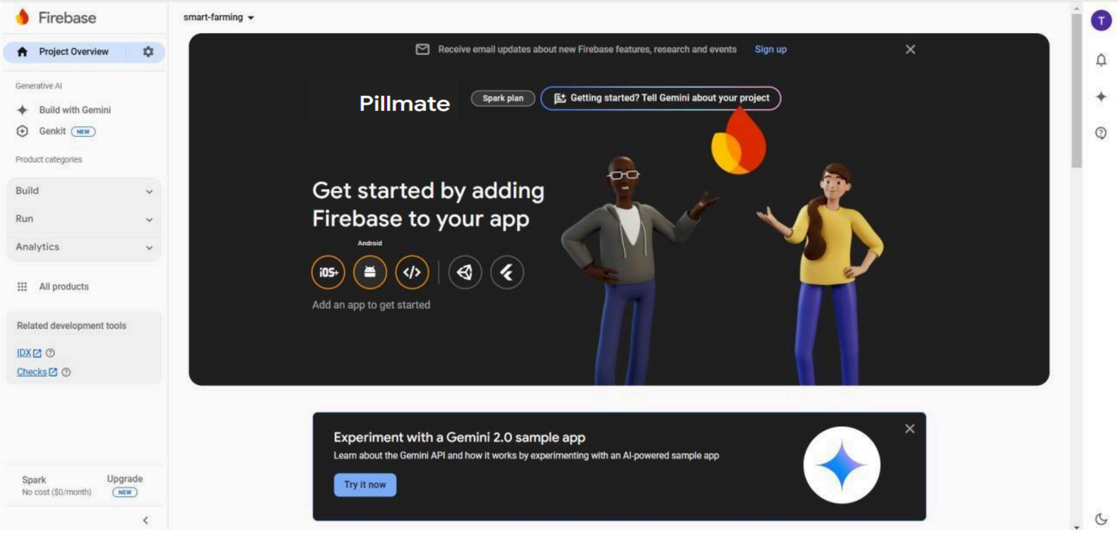
1.2) Click on Create a Project and give it a suitable name and enable Google Analytics (optional) & Click continue and complete the setup



Your Firebase project is ready

Step 2:- Add Firebase to Your Flutter App

2.1) Click on Android/iOS/Web based on your Flutter application



Receive email updates about new Firebase features, research and events

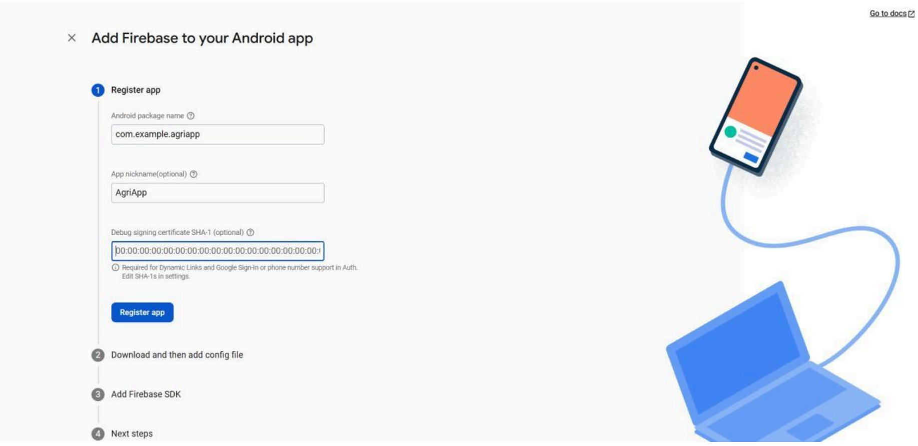
Get started by adding Firebase to your app

Add an app to get started

Experiment with a Gemini 2.0 sample app

Learn about the Gemini API and how it works by experimenting with an AI-powered sample app

2.2) Register your app with a unique package name (found in android/app/build.gradle for Android).


Go to docs
Add Firebase to your Android app
1 Register app
Register app
2 Download and then add config file
3 Add Firebase SDK
4 Next steps

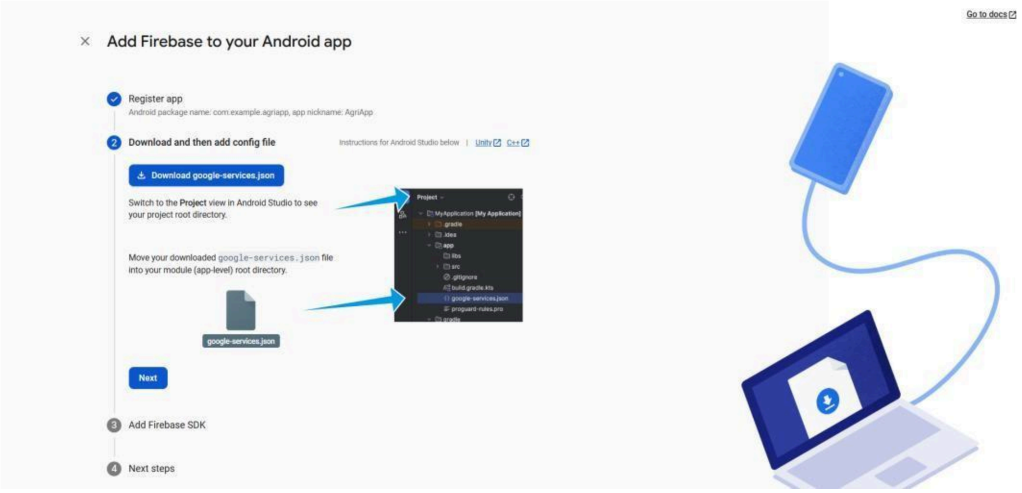
Android package name: com.example.agriapp

App nickname(optional): AgriApp

Debug signing certificate SHA-1 (optional): 00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:0

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

2.3) Download the google-services.json (for Android) & place the JSON file inside android/app/ directory.



Go to docs

× Add Firebase to your Android app

Register app
Android package name: com.example.agriapp, app nickname: AgriApp

2 Download and then add config file

Instructions for Android Studio below | Unity C++

Download google-services.json

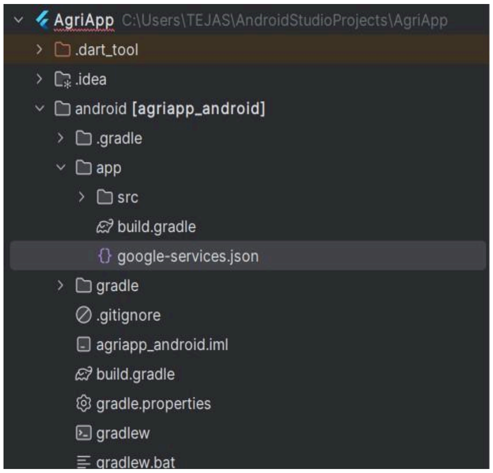
Switch to the **Project** view in Android Studio to see your project root directory.

Move your downloaded `google-services.json` file into your module (app-level) root directory.

Next

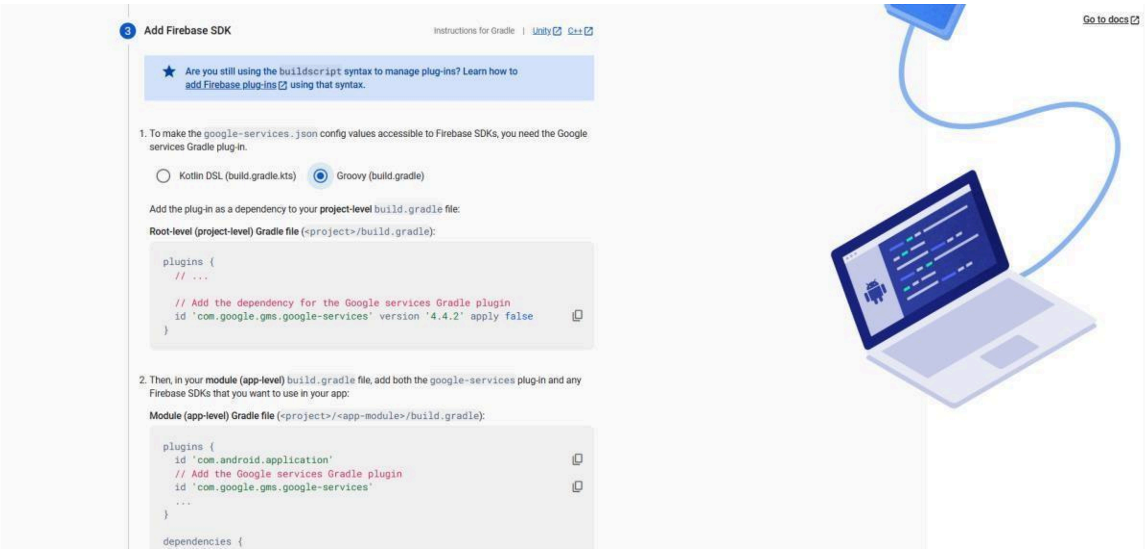
3 Add Firebase SDK

4 Next steps



```
AgriApp C:\Users\TEJAS\AndroidStudioProjects\AgriApp
  .dart_tool
  .idea
  android [agriapp_android]
    .gradle
    app
      src
      build.gradle
      google-services.json
    gradle
    .gitignore
    agriapp_android.iml
    build.gradle
    gradle.properties
    gradlew
    gradlew.bat
```

2.4) Add Firebase SDK dependencies to android/build.gradle



Go to docs

3 Add Firebase SDK

Instructions for Gradle | Unity C++

★ Are you still using the `buildscript` syntax to manage plug-ins? Learn how to add Firebase plug-ins using that syntax.

1. To make the `google-services.json` config values accessible to Firebase SDKs, you need the Google services Gradle plug-in.

○ Kotlin DSL (build.gradle.kts) ● Groovy (build.gradle)

Add the plug-in as a dependency to your **project-level** `build.gradle` file:

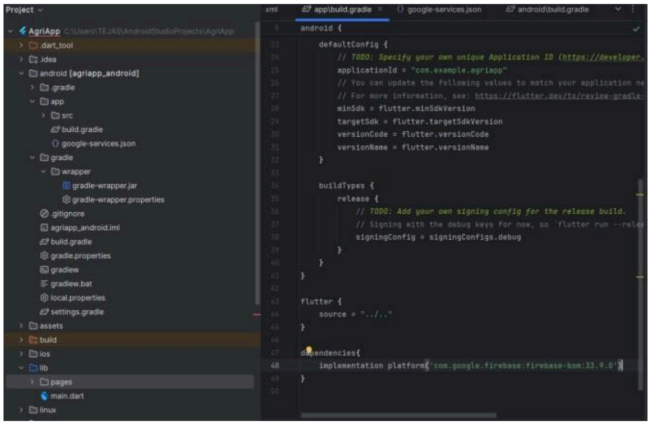
Root-level (project-level) Gradle file (`<project>/build.gradle`):

```
plugins {
  // ...

  // Add the dependency for the Google services Gradle plugin
  id 'com.google.gms.google-services' version '4.4.2' apply false
}
```

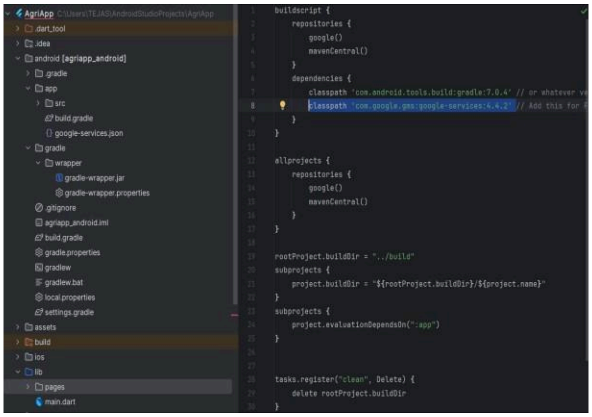
2. Then, in your **module (app-level)** `build.gradle` file, add both the `google-services` plug-in and any Firebase SDKs that you want to use in your app:

Module (app-level) Gradle file (`<project>/<app-module>/build.gradle`):

```
plugins {
  id 'com.android.application'
  // Add the Google services Gradle plugin
  id 'com.google.gms.google-services'
  ...
}

dependencies {
```



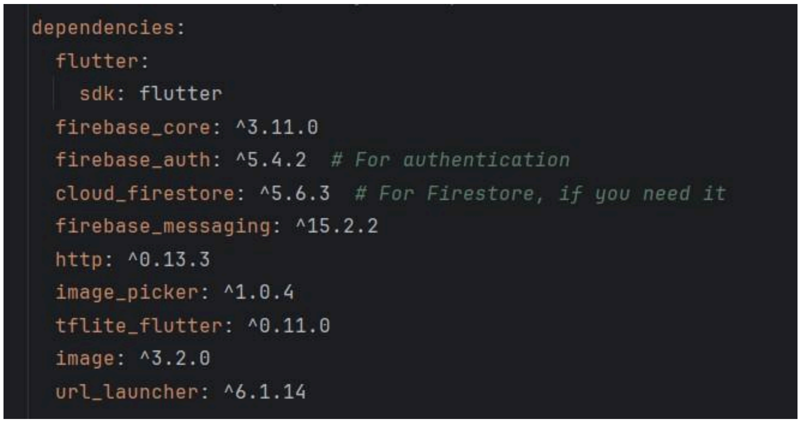
```
android {
    defaultConfig {
        // TODO: Specify your own unique Application ID (https://developer.
        applicationId = "com.example.agriapp"
        // You can update the following values to match your application ne
        // For more information, see: https://flutter.dev/to/review-gradle-
        minSdk = flutter.minSdkVersion
        targetSdk = flutter.targetSdkVersion
        versionCode = flutter.versionCode
        versionName = flutter.versionName
    }

    buildTypes {
        release {
            // TODO: Add your own signing config for the release build.
            // Signing with the debug keys for now, so `flutter run --relea
            signingConfig = signingConfigs.debug
        }
    }
}

flutter {
    source = "../.."
}

dependencies{
    implementation platform('com.google.firebase:firebase-bom:33.9.0')
}
```



```
buildscript {
    repositories {
        google()
        mavenCentral()
    }
    dependencies {
        classpath 'com.android.tools.build:gradle:7.0.4' // or whatever ve
        classpath 'com.google.gms:google-services:4.4.2' // Add this for F
    }
}

allprojects {
    repositories {
        google()
        mavenCentral()
    }
}

rootProject.buildDir = "../build"
subprojects {
    project.buildDir = "${rootProject.buildDir}/${project.name}"
}
subprojects {
    project.evaluationDependsOn(":app")
}


tasks.register("clean", Delete) {
    delete rootProject.buildDir
}
```

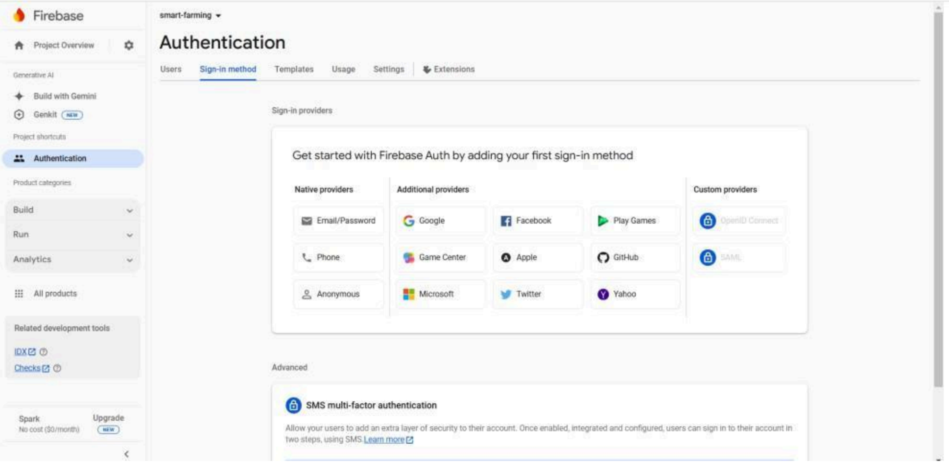
Step 3: - Add Firebase Authentication to Your App

3.1) Add Firebase Authentication Dependencies



```
dependencies:
  flutter:
    sdk: flutter
  firebase_core: ^3.11.0
  firebase_auth: ^5.4.2  # For authentication
  cloud_firestore: ^5.6.3  # For Firestore, if you need it
  firebase_messaging: ^15.2.2
  http: ^0.13.3
  image_picker: ^1.0.4
  tflite_flutter: ^0.11.0
  image: ^3.2.0
  url_launcher: ^6.1.14
```

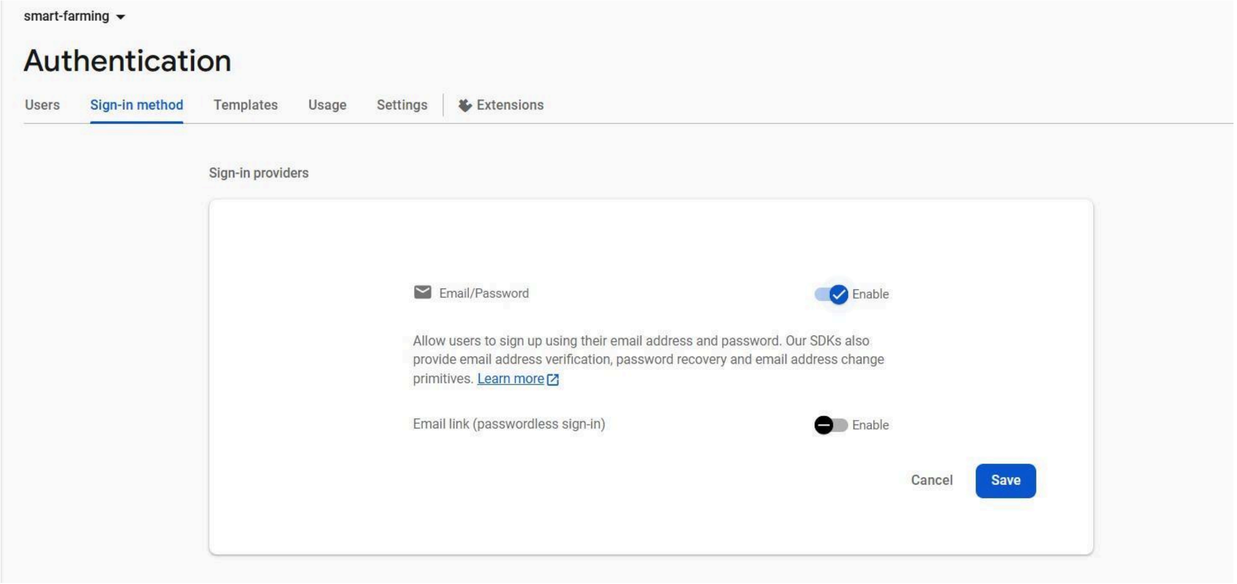
3.2) Enable Authentication in Firebase Console
Go to **Firebase Console →**
Authentication.
Click on **Sign-in method** and enable **Email/Password** (or any other method like Google).
Click Save



Get started with Firebase Auth by adding your first sign-in method

SMS multi-factor authentication

Allow your users to add an extra layer of security to their account. Once enabled, integrated and configured, users can sign in to their account in two steps, using SMS. Learn more



smart-farming

Authentication

Sign-in providers

Email/Password ☑ Enable

Allow users to sign up using their email address and password. Our SDKs also provide email address verification, password recovery and email address change primitives. Learn more

Email link (passwordless sign-in) ○ Enable

3.3) Implement Authentication in
Flutter Modify main.dart

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

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

Step 4: -Configure Firebase Realtime Database

4.1) Go to Firebase Console → Realtime Database.
4.2) Click **Create Database** → Choose location → Set rules (for development, set read/write to true).
4.3) Click **Publish**.

Code:-

Register_page.dart

```
class _RegistrationPageState extends
State<RegistrationPage> {
  final _formKey =
GlobalKey<FormState>(); bool
_isLoading = false; String
_name = '';
  String _email = ''; String
  _state = ''; String
  _district = ''; String
  _password = ''; String
  _phone = '';

  final FirebaseAuth _auth =
FirebaseAuth.instance;

  // Firebase Registration
  Future<void> _handleRegistration() async
{
    if (_formKey.currentState!.validate()) {
      setState(() {
        _isLoading = true;
      });

      try {
        // Register user with Firebase
Authentication (Email and Password)
        UserCredential userCredential = await
_auth.createUserWithEmailAndPassword(
          email: _email,
          password: _password,
        );

        // Get the user ID from Firebase
Authentication user
        String userId =
userCredential.user!.uid;

        // Store extra user information in
Firestore
        await
FirebaseFirestore.instance.collection('users')
.doc(userId).set({
          'name': _name,
          'email': _email,
          'phone':
          _phone, 'state':
          _state, 'district':
          _district,
          // You can add other fields here
        });

        setState(() {
          _isLoading = false;
        });

        // Navigate to OTP verification
page after successful registration
        Navigator.pushReplacementNamed(
          context,
          '/otp',
          arguments: _phone, // Pass the phone
number here
        );
      } catch (e) {
        setState(() {
          _isLoading = false;
        });

ScaffoldMessenger.of(context).showSnack
B ar(
          SnackBar(content: Text("Registration
failed: $e")),
        );
    }
  }
}
```

login_page.dart

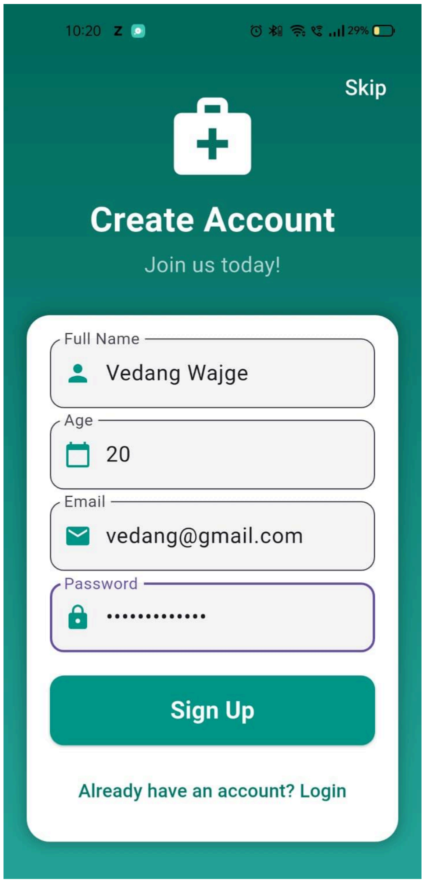
```
import 'package:flutter/material.dart'; import
'package:firebase_auth/firebase_auth.dart';

class LoginPage extends StatefulWidget {
  @override
  _LoginPageState createState() =>
_LoginPageState();
}

class _LoginPageState extends
State<LoginPage> {
  final _formKey =
GlobalKey<FormState>(); final
FirebaseAuth _auth =
FirebaseAuth.instance;

  TextEditingController _emailController =
TextEditingController();
TextEditingController _passwordController
= TextEditingController();

  bool _isLoading = false;
  String _errorMessage = '';

  Future<void> _loginUser() async {
    if (!_formKey.currentState!.validate())
return;

    setState(() {
      _isLoading = true;
      _errorMessage = '';
    });

    try {
      UserCredential userCredential = await
_auth.signInWithEmailAndPassword( email:
        _emailController.text.trim(), password:
_passwordController.text.trim(),
      );
      User? user =

      userCredential.user; if (user !=

      null) {

Navigator.pushReplacementNamed(context
, '/home');
      } else {
        setState(
        () {
          _errorMessage = "Something went
wrong. Please try again.";
        });
      }
    } on FirebaseAuthException catch (e) {
      setState(() {
        _errorMessage = e.message ?? "An
error occurred. Please try again.";
      });
    }

    setState(() {
      _isLoading = false;
    });
  }
```

edit_profile.dart

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

class MyAccountPage extends StatefulWidget
{
  @override
  _MyAccountPageState createState() =>
_MyAccountPageState();
}

class _MyAccountPageState extends
State<MyAccountPage> {
  final _formKey =
GlobalKey<FormState>(); String
name = '';
  String  phone  =  '';
  String  email  =  '';
  String state = '';
  String  language  =  'English';
  List<String>  myCrops  =  [];
  bool isLoading = true;

  @override
  void initState() {
    super.initState();
    _fetchUserData();
  }

  // Fetch data from Firestore
  _fetchUserData() async { User?
    user =
FirebaseAuth.instance.currentUser;

    if (user != null) { try
      {
        DocumentSnapshot doc = await
FirebaseFirestore.instance
            .collection('users')
            .doc(user.uid)
            .get();

        if (doc.exists) {
          setState(() {
            name = doc['name'];
            phone = doc['phone'];
            email = doc['email'];
            state = doc['state'];
            language = doc['language'];
            myCrops =
List<String>.from(doc['myCrops']);
            isLoading = false;
          });
        }
      } catch (e) {
        print("Error fetching user data: $e");
        setState(() {
          isLoading = false;
        });
      }
    }
  }

  // Save updated data to Firestore
  _saveUserData() async {
    User? user =
FirebaseAuth.instance.currentUser;

    if (user != null) {
      try {
        await
FirebaseFirestore.instance.collection('users')
.doc(user.uid).update({
          'name': name,
          'phone': phone,
          'email': email,
          'state': state,
          'language':
          language,
          'myCrops':
          myCrops,
        });
    // Show success message

ScaffoldMessenger.of(context).showSnackB
ar(SnackBar(content: Text('Changes
saved!')));
   } catch (e) {
    print("Error saving user data: $e");

ScaffoldMessenger.of(context).showSnackB
ar(SnackBar(content: Text('Error saving
changes')));
   }



  }
 }
```

Main.dart

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

class MyApp extends StatelessWidget {
 @override
 Widget build(BuildContext context) { return
  MaterialApp(
  debugShowCheckedModeBanner: false,
  title: 'AgriApp',
   theme: ThemeData( primarySwatch:
    Colors.green, colorScheme:
ColorScheme.fromSeed(seedColor:
Color(0xFF6A9A5B)),
   ),
   home:
FirebaseAuth.instance.currentUser == null ?
LoginPage() : MainScreen(),
   routes: {
    '/login': (context) => LoginPage(),
    '/register': (context) =>
RegistrationPage(),
    '/otp': (context)
    =>
OtpVerificationPa
     ge(
     phoneNumb
     er:
ModalRoute.of(context)!.settings.argument
s as String,
    ),
    '/home': (context) => MainScreen(),
   },
  );
 }
}

class MainScreen extends StatefulWidget {
 @override
 _MainScreenState createState() =>
  _MainScreenState();
 }

 class _MainScreenState extends
 State<MainScreen> {
  int _currentIndex = 0;

  final List<Widget> _pages
   = [ HomePage(),
   WeatherPage(),
   DiseaseDetectionPage(),
   CropListPage(),
   MyAccountPage(),
  ];
```



Create Account

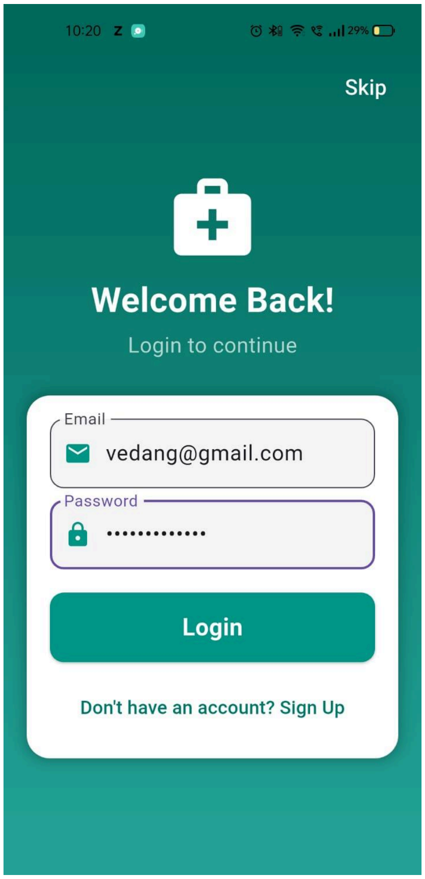
Join us today!

Full Name: Vedang Wajge

Age: 20

Email: vedang@gmail.com

Password: •••••••••••••

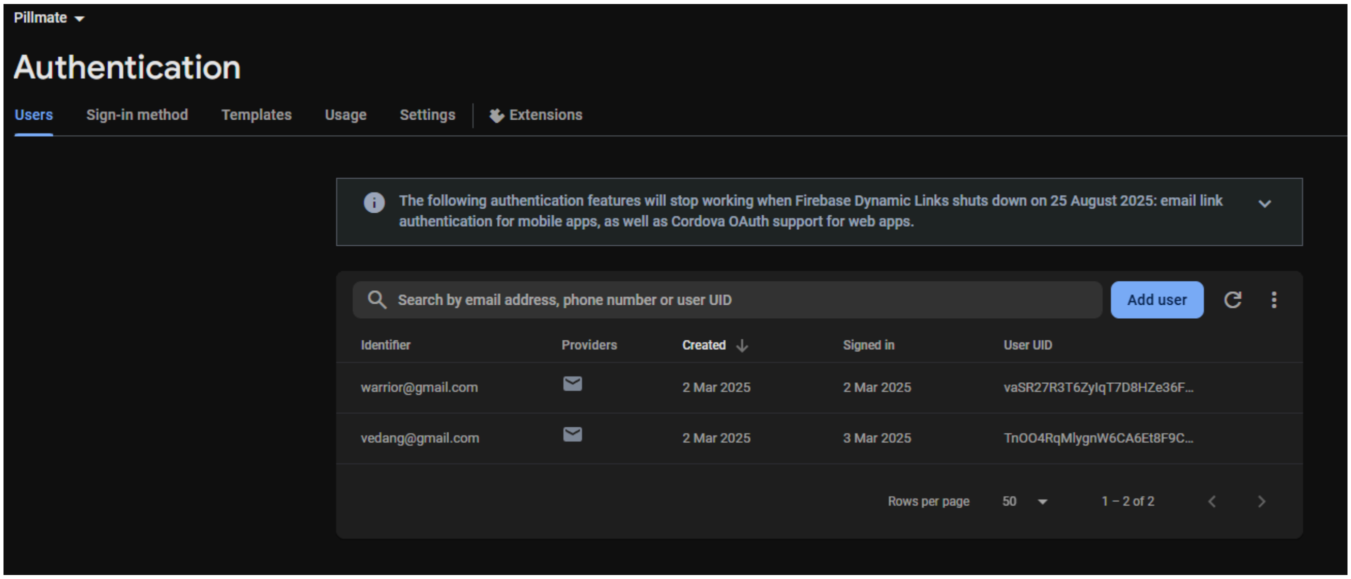


Welcome Back!

Login to continue

Email: vedang@gmail.com

Password: •••••••••••••



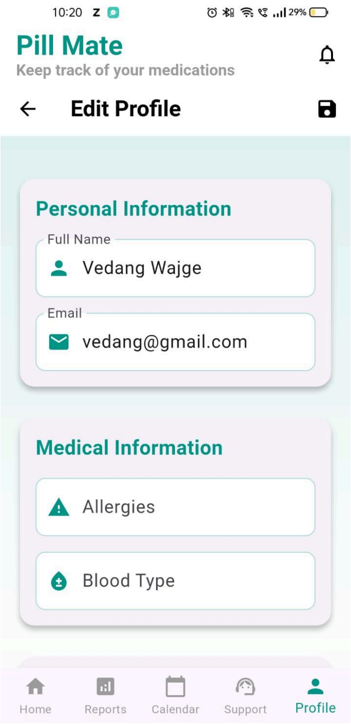
Authentication

The following authentication features will stop working when Firebase Dynamic Links shuts down on 25 August 2025: email link authentication for mobile apps, as well as Cordova OAuth support for web apps.

Identifier	Providers	Created ↓	Signed in	User UID
warrior@gmail.com	✉	2 Mar 2025	2 Mar 2025	vaSR27R3T6ZylqT7D8HZe36F...
vedang@gmail.com	✉	2 Mar 2025	3 Mar 2025	TnOO4RqMlygnW6CA6Et8F9C...

Rows per page 50 1 – 2 of 2

After Registering, the user details is saved in the database.



10:20 Z 29%

Pill Mate

Keep track of your medications

Edit Profile

Personal Information

Full Name: Vedang Wajge

Email: vedang@gmail.com

Medical Information

Allergies

Blood Type

User details get fetched from the database in the profile page.