EXPERIMENT NO. 6

Aim: To Connect Flutter UI with fireBase database, ie. To Set Up Firebase with Flutter for iOS and Android Apps

Theory:
Firebase is a comprehensive platform provided by Google for building mobile and web applications. It offers a wide range of tools and services to help developers build high-quality apps quickly and efficiently. Here's an overview of Firebase and its key components:
Key Components:
1. Realtime Database: Firebase Realtime Database is a NoSQL cloud database that allows developers to store and sync data in real-time across multiple clients. It's suitable for applications requiring real-time updates, such as chat apps, collaborative tools, and live data feeds.
2. Cloud Firestore: Firestore is Firebase's newer database solution that offers more powerful querying capabilities, scalability, and real-time updates. It's a flexible, scalable database for mobile, web, and server development.
3. Authentication: Firebase Authentication provides a secure and easy-to-use authentication system that supports various authentication methods, including email/password, phone number, Google Sign-In, Facebook Login, and more.
4. Cloud Storage: Firebase Cloud Storage allows developers to store and serve user-generated content, such as images, videos, and audio files, directly from Google's infrastructure. It offers scalable, secure, and reliable storage solutions with powerful SDKs for easy integration.
5. Analytics: Firebase Analytics offers powerful analytics features to help developers understand user behavior, measure app performance, and track key metrics. It provides insights into user engagement, retention, and conversion rates.

Prerequisites:
- A Google account to use Firebase.
- Developing for iOS will require XCode.
- To download and install Flutter.
- To download and install Android Studio and Visual Studio Code.
- It is recommended to install plugins for your code editor.
- Flutter and Dart plugins installed for Android Studio.

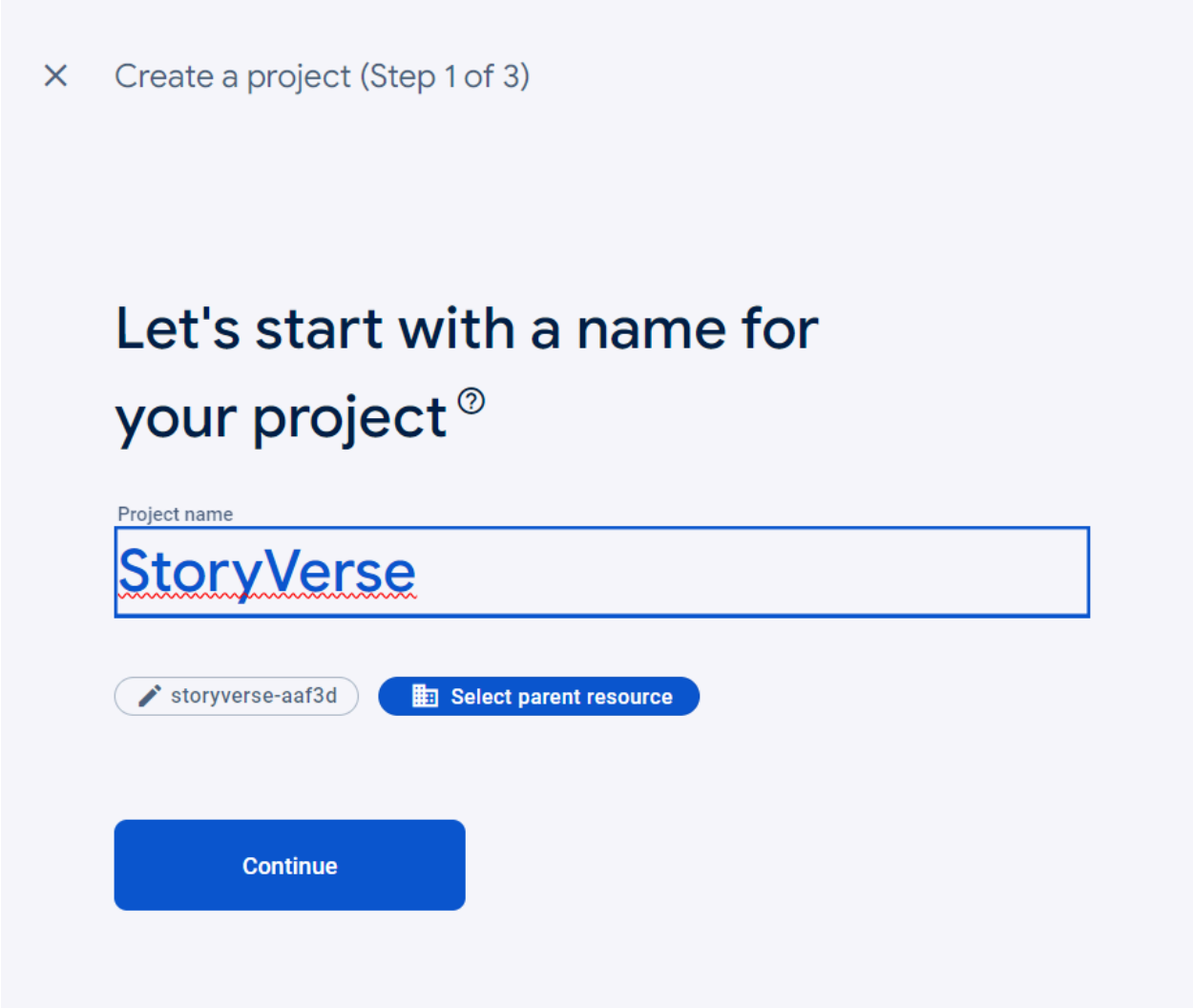
● Flutter extension installed for Visual Studio Code.

1. Create a flutter app

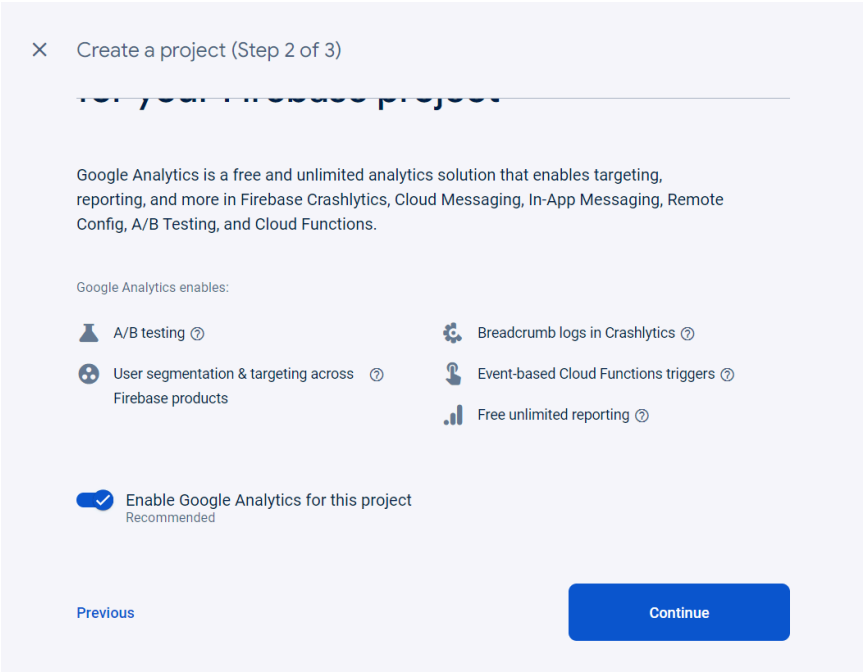
flutter create storyverse
Navigate to the new project directory:
cd storyverse
Now that we've got a Flutter project up and running, we can add Firebase.

Creating a New Firebase Project

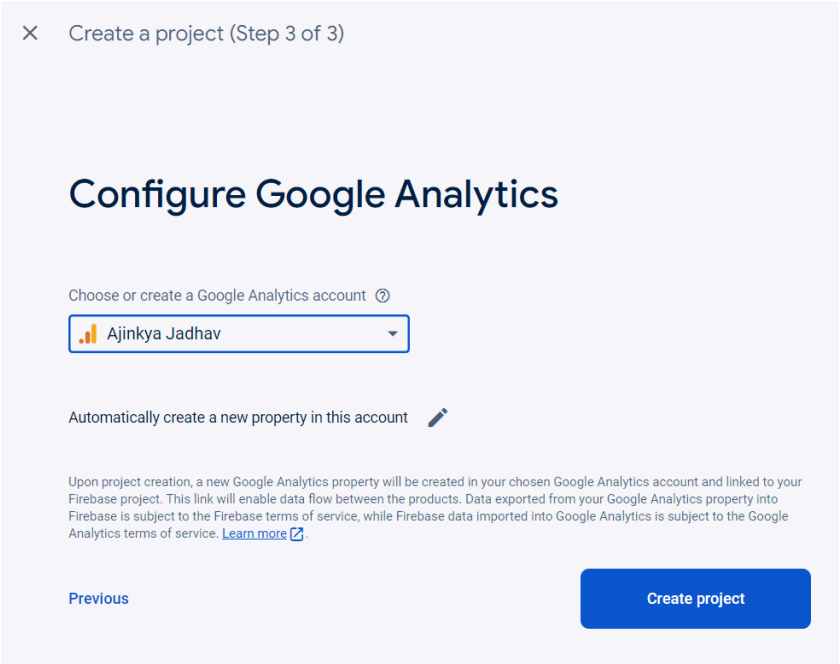
First, log in with your Google account to manage your Firebase projects. From within the Firebase dashboard, select the Create new project button and give it a name:

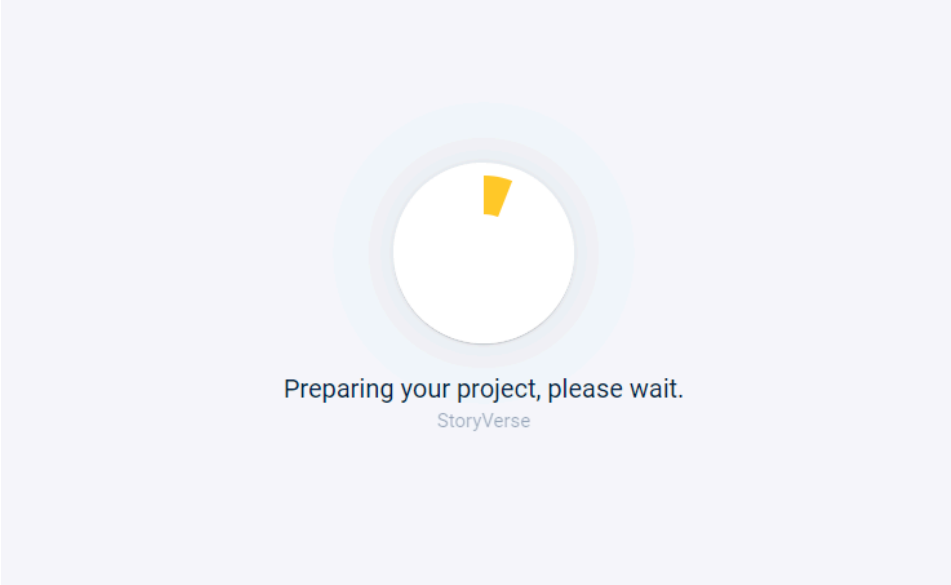


Next, we're given the option to enable Google Analytics.



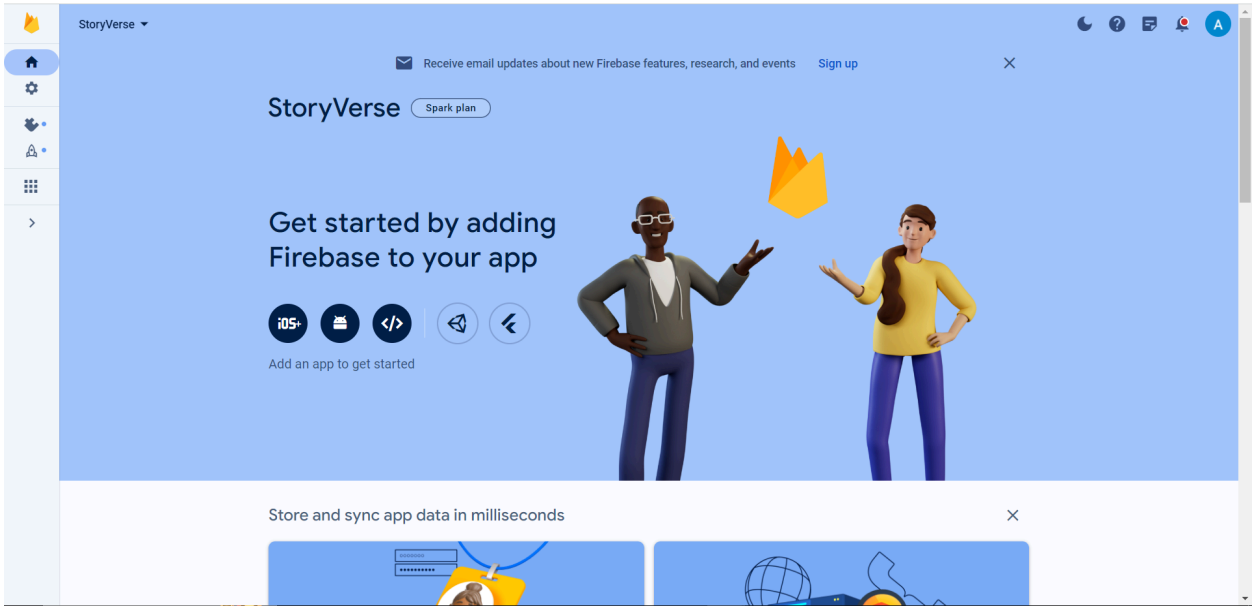
If you choose to use Google Analytics, you will need to review and accept the terms and conditions prior to project creation.



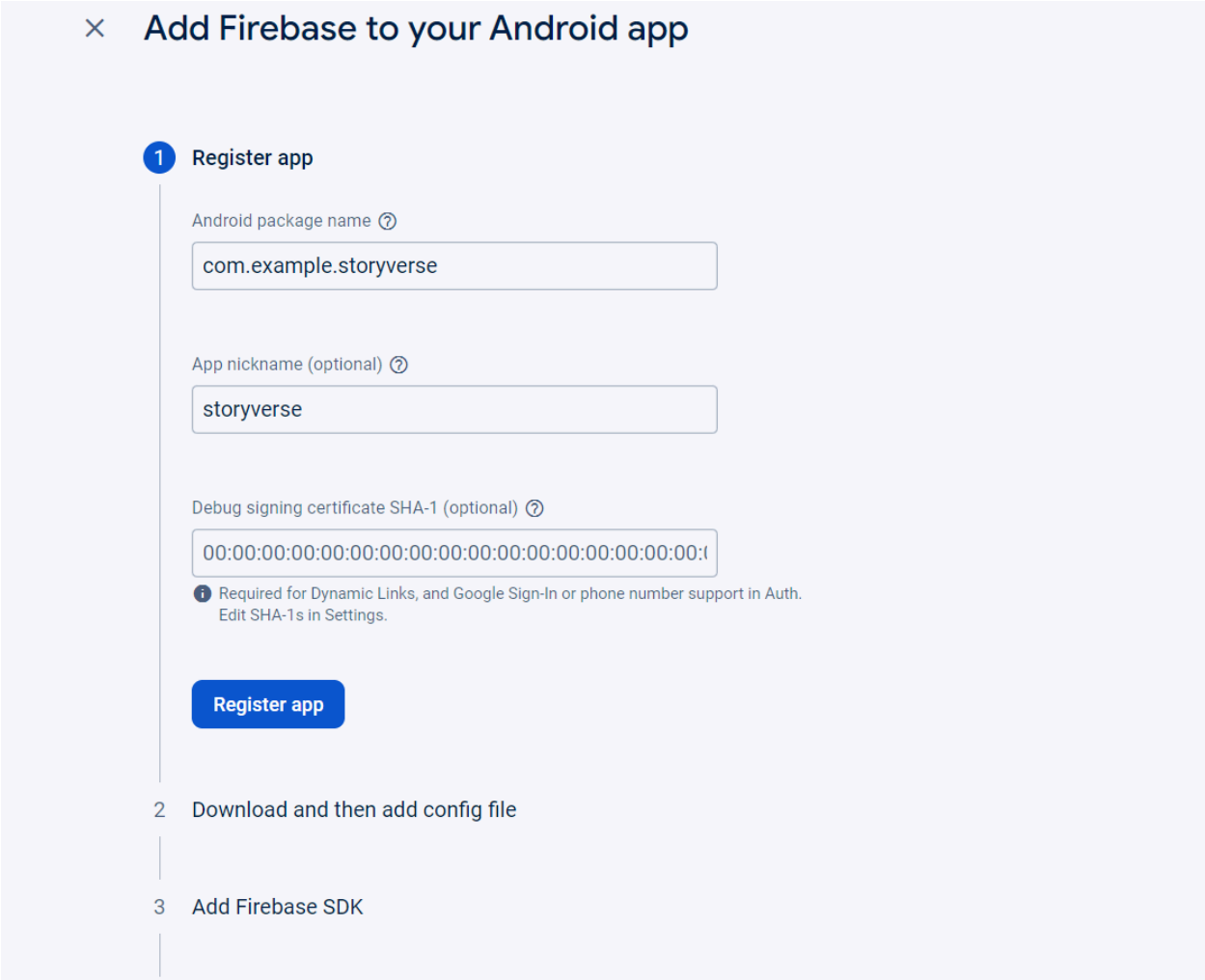


After pressing Continue, the project will be created and resources will be provisioned. We will then be directed to the dashboard for the new project.

Adding Android support
Registering the App
In order to add Android support to our Flutter application, select the Android logo from the dashboard.



This brings us to the following screen:



The most important thing here is to match up the Android package name that you choose here with the one inside of our application.

Once you've decided on a name, open android/app/build.gradle in your code editor and update the applicationId to match the Android package name:

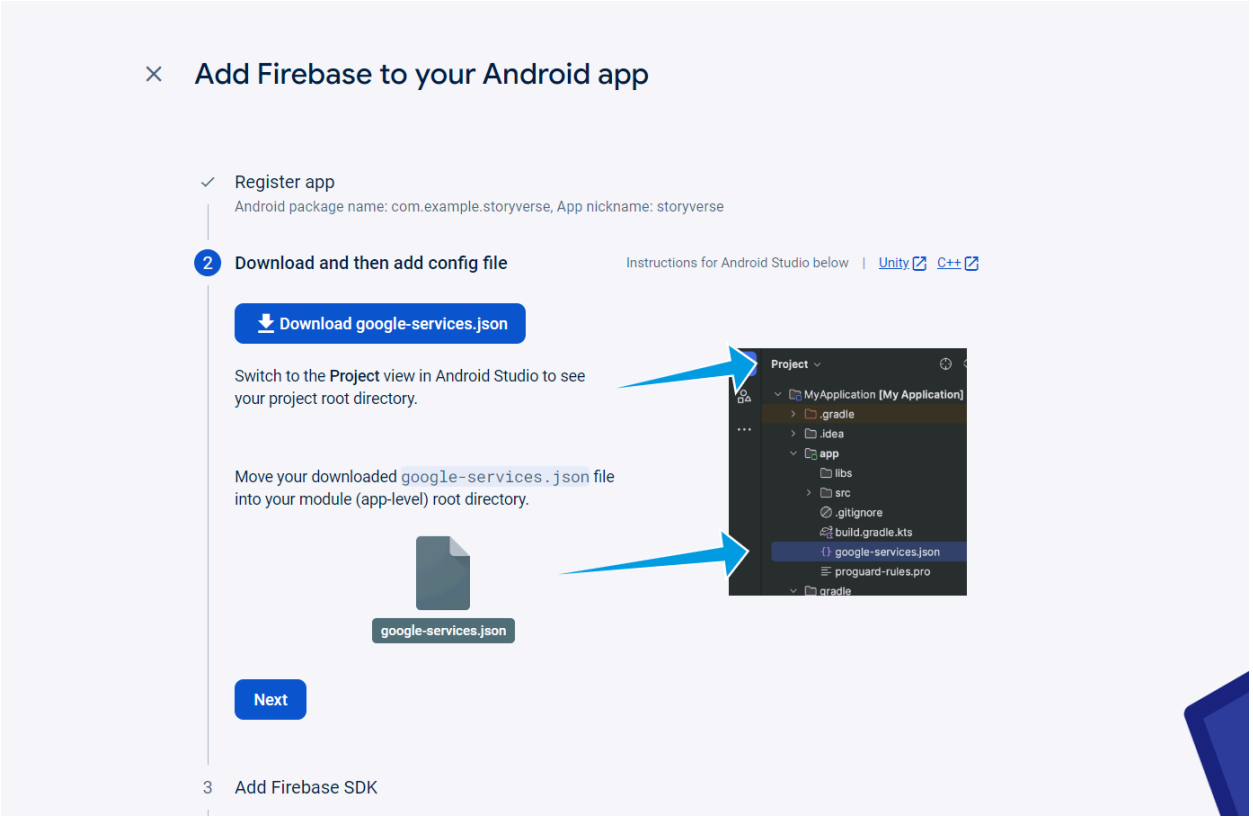
main.dart exp2\... | build.gradle ● | main.dart exp5\...

exp2 > android > app > build.gradle

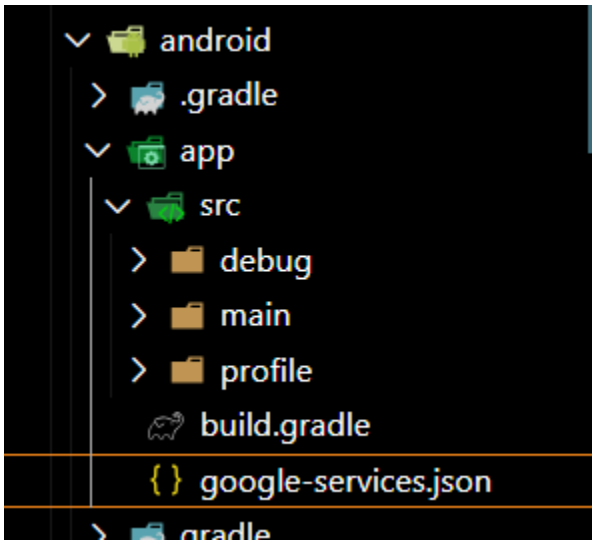
```
25  android {
39      sourceSets {
41      }
42
43      defaultConfig {
44          // TODO: Specify your own unique Application ID (https://developer.android.co
45          applicationId "com.example.storyverse"
46          // You can update the following values to match your application needs.
47          // For more information, see: https://docs.flutter.dev/deployment/android#rev
48          minSdkVersion flutter.minSdkVersion
49          targetSdkVersion flutter.targetSdkVersion
50          versionCode flutterVersionCode.toInteger()
51          versionName flutterVersionName
52      }
53
54      buildTypes {
55          release {
56              // TODO: Add your own signing config for the release build.
57              // Signing with the debug keys for now, so `flutter run --release` works.
58              signingConfig signingConfigs.debug
59          }
```

You can skip the app nickname and debug signing keys at this stage. Select Register app to continue.

The next step is to add the Firebase configuration file into our Flutter project. This is important as it contains the API keys and other critical information for Firebase to use. Select Download google-services.json from this page:



Next, move the google-services.json file to the android/app directory within the Flutter project.



We'll now need to update our Gradle configuration to include the Google Services plugin. Follow these steps to add the firebase sdk in the source code

3 Add Firebase SDK

Instructions for Gradle | Unity C++

Are you still using the `buildscript` syntax to manage plugins? Learn how to add Firebase plugins using that syntax.

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

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

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

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

```
plugins {
  // ...

  // Add the dependency for the Google services Gradle plugin
  id("com.google.gms.google-services") version "4.4.1" apply false
}
```

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

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

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

dependencies {
  // Import the Firebase BoM
  implementation(platform("com.google.firebase:firebase-bom:32.7.4"))

  // TODO: Add the dependencies for Firebase products you want to use
  // When using the BoM, don't specify versions in Firebase dependencies
  implementation("com.google.firebase:firebase-analytics")

  // Add the dependencies for any other desired Firebase products
  // https://firebase.google.com/docs/android/setup#available-libraries
}
```

   By using the Firebase Android BoM, your app will always use compatible Firebase library versions. Learn more

3. After adding the plugin and the desired SDKs, sync your Android project with Gradle files.

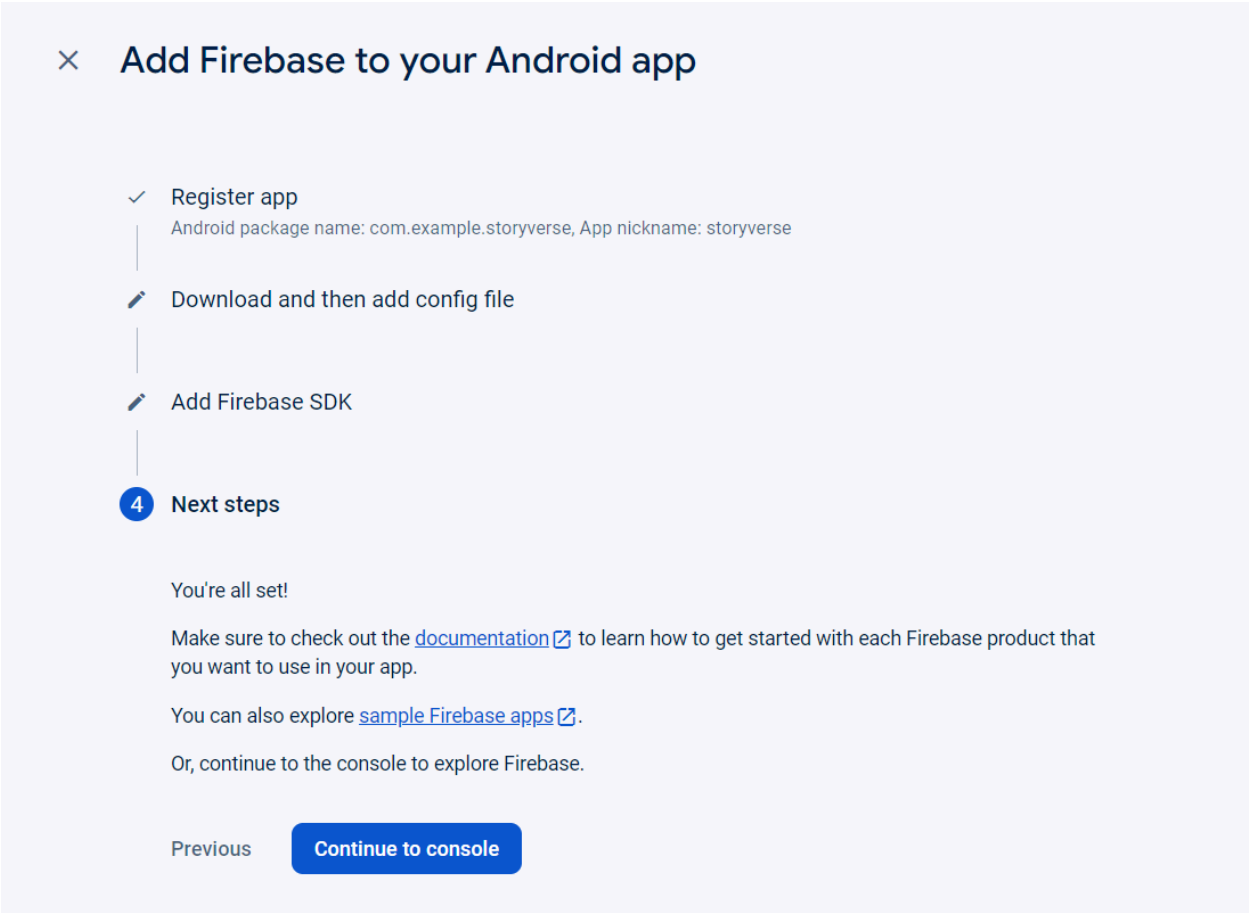
Add the respective code lines in the respective files

```
plugins {
    id "com.android.application"
    id "kotlin-android"
    id "dev.flutter.flutter-gradle-plugin"
    id("com.google.gms.google-services") version "4.4.1" apply false
}
```

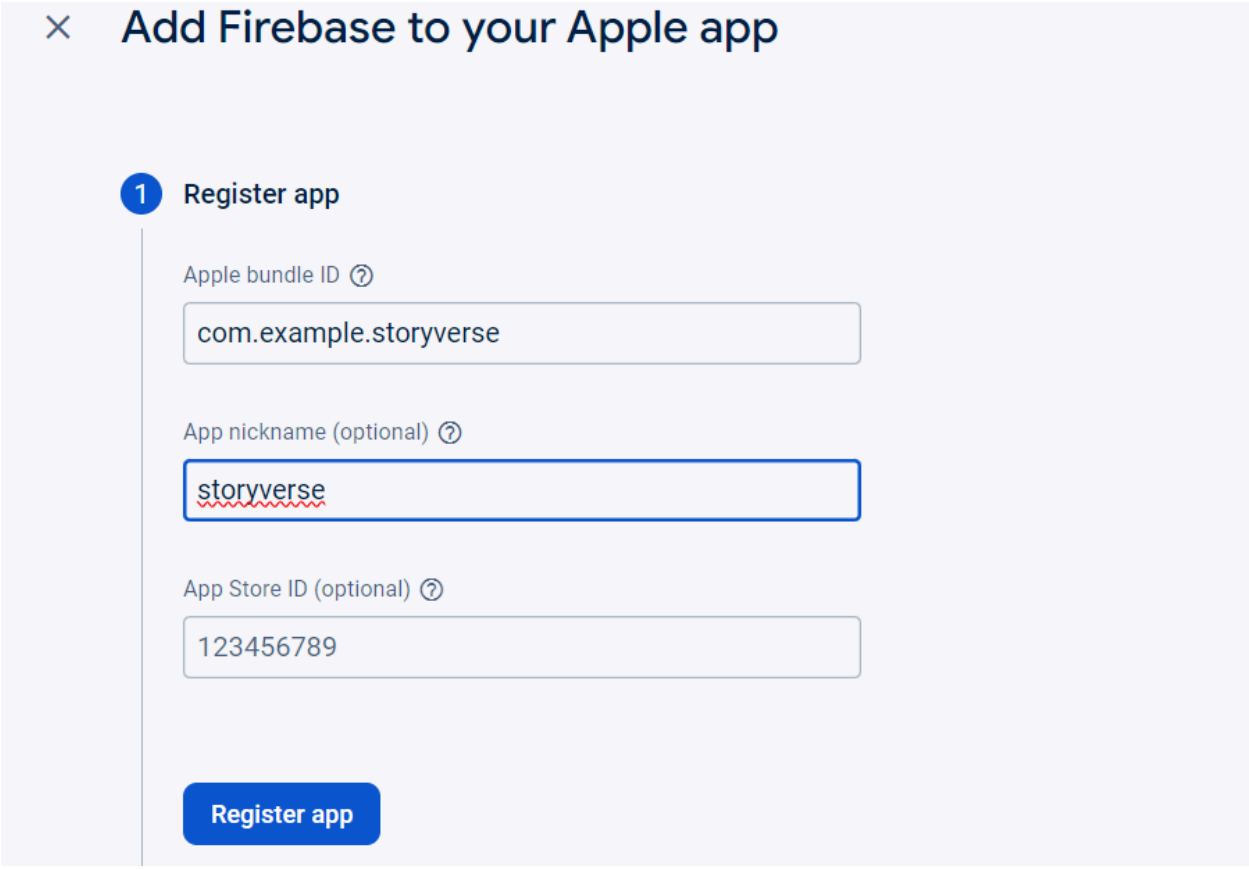
```
plugins {
    id "com.android.application"
    id "kotlin-android"
    id "dev.flutter.flutter-gradle-plugin"
    id("com.android.application")
    id("com.google.gms.google-services")
}
```

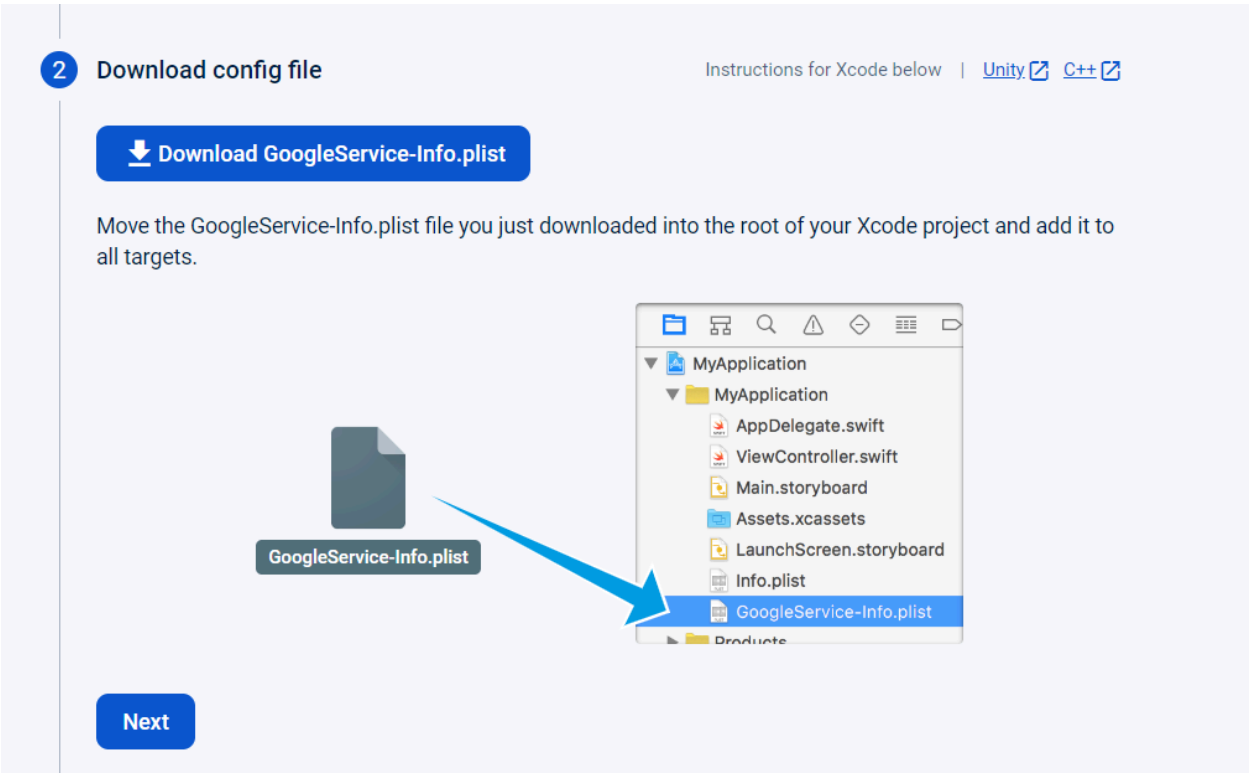
```
dependencies {
    implementation(platform("com.google.firebase:firebase-bom:32.7.4"))
    implementation("com.google.firebase:firebase-analytics")
}
```

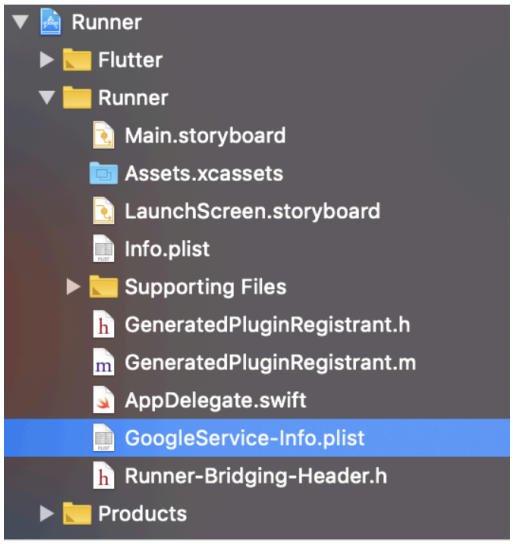
With this update, we're essentially applying the Google Services plugin as well as looking at how other Flutter Firebase plugins can be activated such as Analytics.

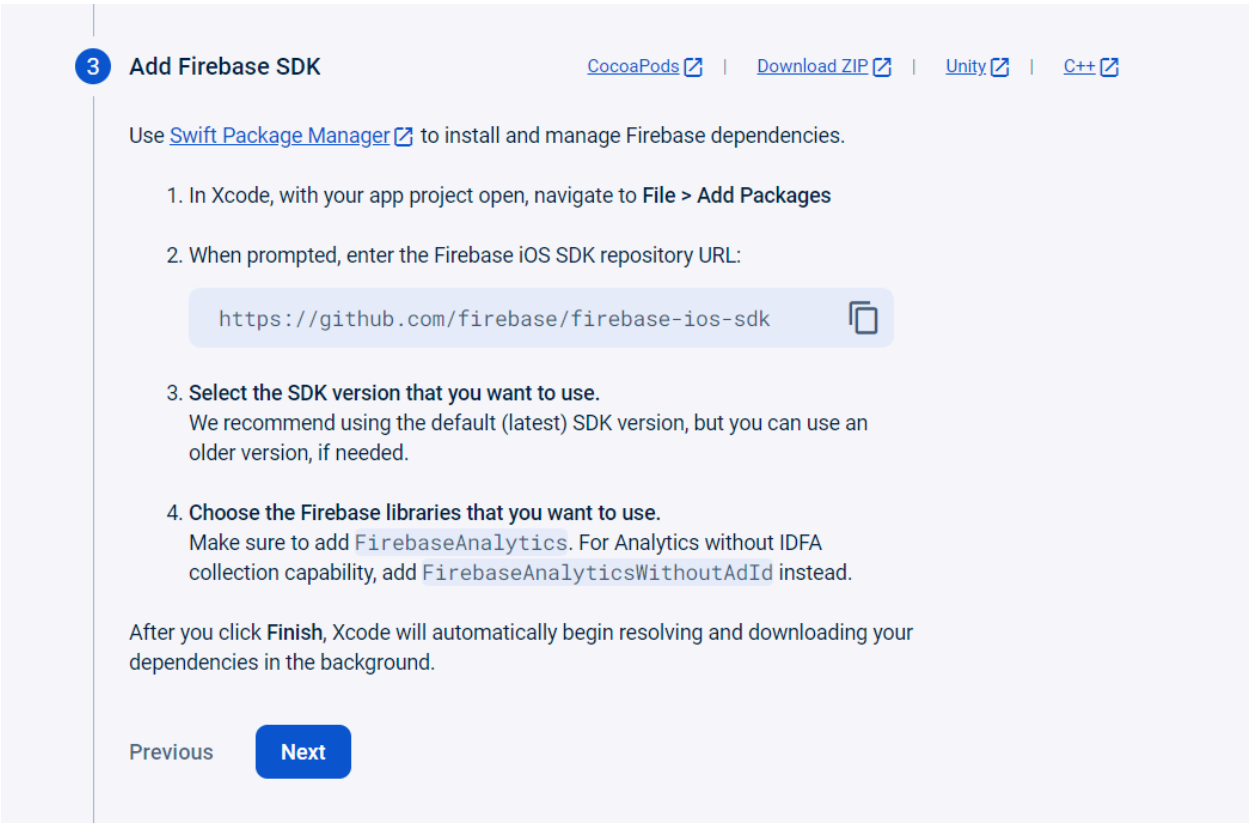


On pressing continue, we are finally done with setting up Firebase for Android.
We follow similar steps for setting it up on iOS.


Add Firebase to your Apple app
1 Register app
Apple bundle ID
com.example.storyverse
App nickname (optional)
storyverse
App Store ID (optional)
123456789
Register app


2 Download config file
Instructions for Xcode below | Unity C++
Download GoogleService-Info.plist
Move the GoogleService-Info.plist file you just downloaded into the root of your Xcode project and add it to all targets.
GoogleService-Info.plist
MyApplication
MyApplication
AppDelegate.swift
ViewController.swift
Main.storyboard
Assets.xcassets
LaunchScreen.storyboard
Info.plist
GoogleService-Info.plist
Next


Runner
Flutter
Runner
Main.storyboard
Assets.xcassets
LaunchScreen.storyboard
Info.plist
Supporting Files
GeneratedPluginRegistrant.h
GeneratedPluginRegistrant.m
AppDelegate.swift
GoogleService-Info.plist
Runner-Bridging-Header.h
Products


3 Add Firebase SDK
CocoaPods | Download ZIP | Unity | C++
Use Swift Package Manager to install and manage Firebase dependencies.
1. In Xcode, with your app project open, navigate to File > Add Packages
2. When prompted, enter the Firebase iOS SDK repository URL:
https://github.com/firebase/firebase-ios-sdk
3. Select the SDK version that you want to use.
We recommend using the default (latest) SDK version, but you can use an older version, if needed.
4. Choose the Firebase libraries that you want to use.
Make sure to add FirebaseAnalytics. For Analytics without IDFA collection capability, add FirebaseAnalyticsWithoutAdId instead.
After you click Finish, Xcode will automatically begin resolving and downloading your dependencies in the background.
Previous
Next

4 Add initialization code

To connect Firebase when your app starts up, add the initialization code below to your app's main entry point.

(•) SwiftUI ( ) Swift ( ) Objective-C

```
import SwiftUI
import FirebaseCore

class AppDelegate: NSObject, UIApplicationDelegate {
  func application(_ application: UIApplication,
                   didFinishLaunchingWithOptions launchOptions: [UIApplicatic
    FirebaseApp.configure()
    return true
  }
}

@main
struct YourApp: App {
  // register app delegate for Firebase setup
  @UIApplicationDelegateAdaptor(AppDelegate.self) var delegate

  var body: some Scene {
    WindowGroup {
      NavigationView {
        ContentView()
      }
    }
  }
}
```

Conclusion:

Setting up Firebase in a Flutter project is a straightforward process that enables developers to leverage powerful backend services seamlessly. By integrating Firebase, developers gain access to features like authentication, real-time database, cloud storage, and more, enhancing the functionality and scalability of their Flutter apps. The process typically involves adding Firebase SDK dependencies to the Flutter project, configuring the Firebase project settings, and initializing Firebase services within the app. Once set up, developers can utilize Firebase APIs to streamline authentication, store and retrieve data, send notifications, and perform various other tasks, thereby accelerating app development and providing users with a robust and reliable experience.