

MAD & PWA Lab

Journal

Experiment No.	01
Experiment Title.	To install and configure the Flutter Environment
Roll No.	37
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Class	D15B
Subject	MAD & PWA Lab
Lab Outcome	LO1: Understand cross platform mobile application development using Flutter framework
Grade:	

Aim:

To install and configure the Flutter development environment on your system to start building applications with Flutter.

Theory:

Flutter is an open-source framework developed by Google to create cross-platform applications from a single codebase. It enables the development of high-performance apps for Android, iOS, Web, and Desktop. Flutter uses Dart, a programming language developed by Google, which offers fast compilation and powerful async features.

Key Components for Setting Up the Flutter Environment:

1. Flutter SDK:
 - The core development kit for building Flutter applications. It includes the Flutter framework, which provides widgets and tools for creating UIs, and the engine, which handles rendering using the Skia graphics library.
 - It also includes Flutter CLI tools like flutter doctor, flutter run, and flutter build for managing projects and debugging.
2. Dart SDK:
 - Dart is the programming language used by Flutter. It is object-oriented and supports asynchronous programming.
 - Dart uses Just-In-Time (JIT) compilation during development for fast build times and Hot Reload, and Ahead-Of-Time (AOT) compilation for production builds for better performance.
3. IDE (Integrated Development Environment):
 - Android Studio: A full-featured IDE that includes Flutter and Dart plugins, device emulators, and tools for debugging and profiling.
 - Visual Studio Code (VS Code): A lightweight editor with excellent Flutter and Dart plugin support for development and debugging.
4. Platform-Specific Tools:

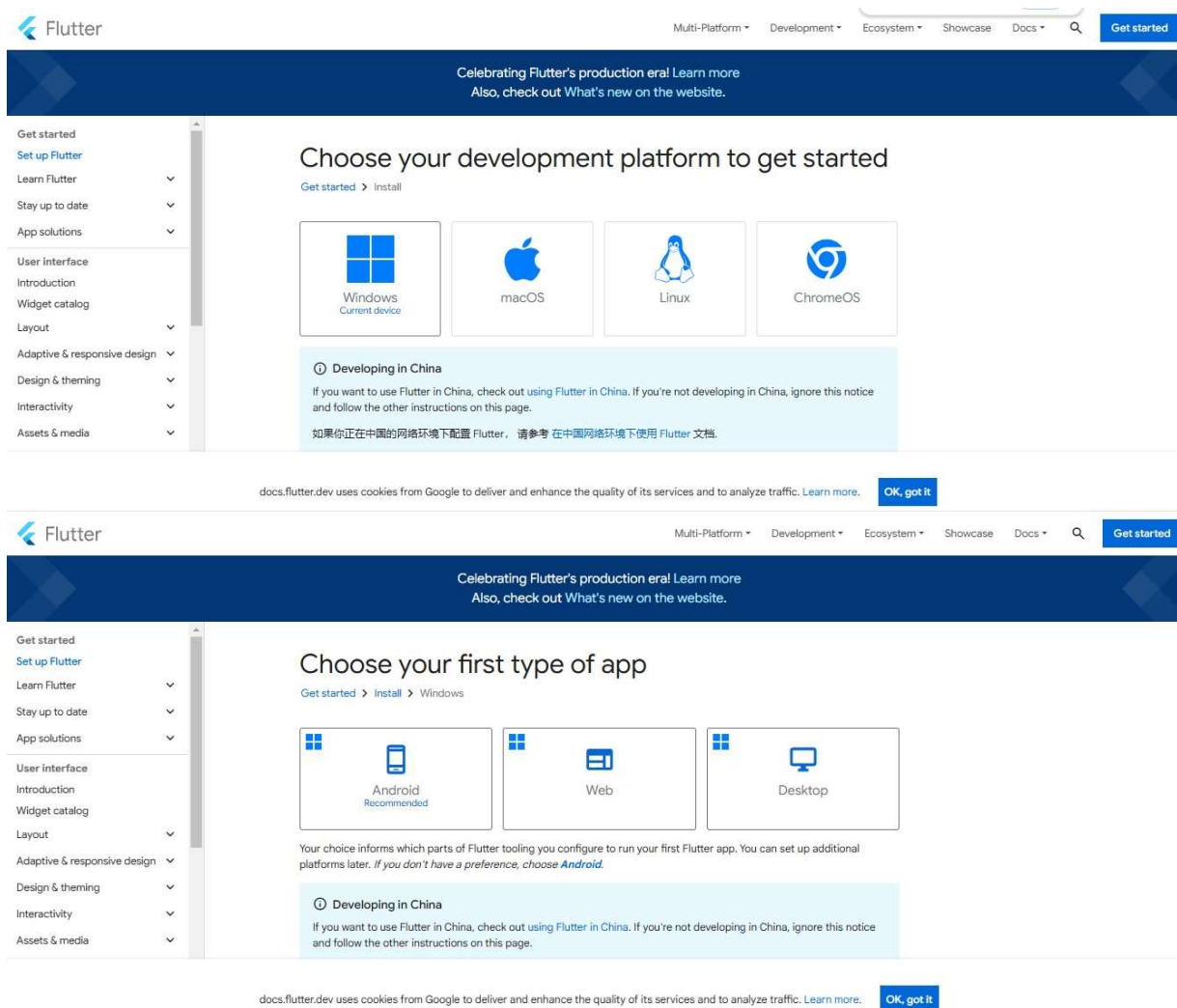
- Android Studio: Required for Android development with Flutter, including the Android SDK and emulator.
- Xcode: Needed for iOS development on macOS, with tools like the iOS Simulator

Steps To Install Flutter:

Step 1:

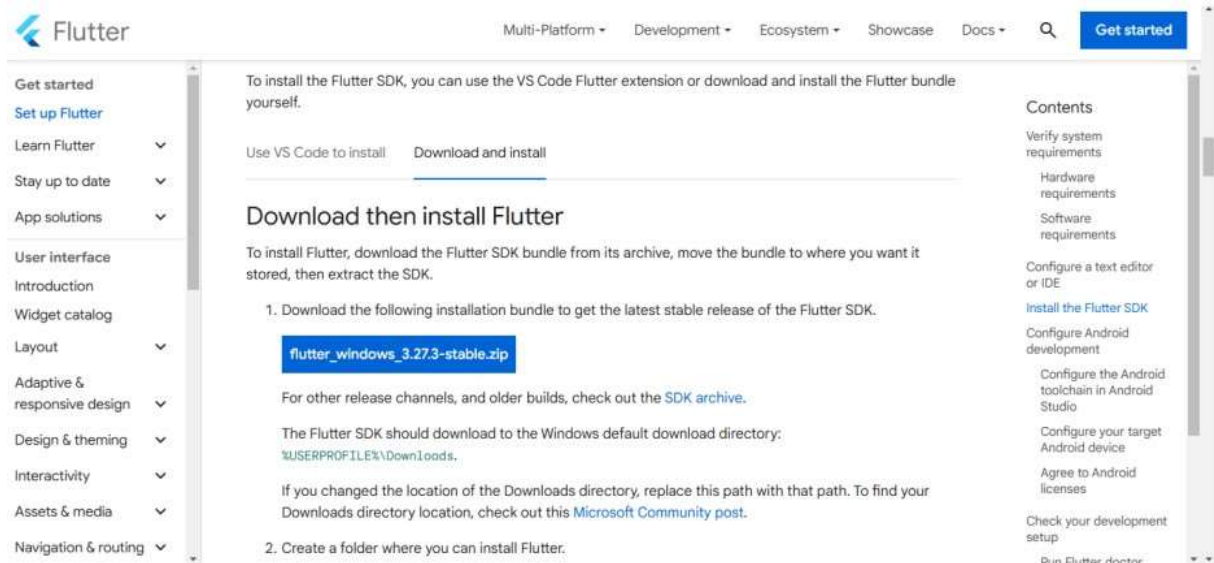
Download the installation bundle of the Flutter Software Development Kit for windows.

To download Flutter SDK, Go to its official website <https://docs.flutter.dev/get-started/install> , you will get the following screen.



Step 2:

Next, to download the latest Flutter SDK, click on the Windows icon. Here, you will find the download link for SDK.



Step 3:

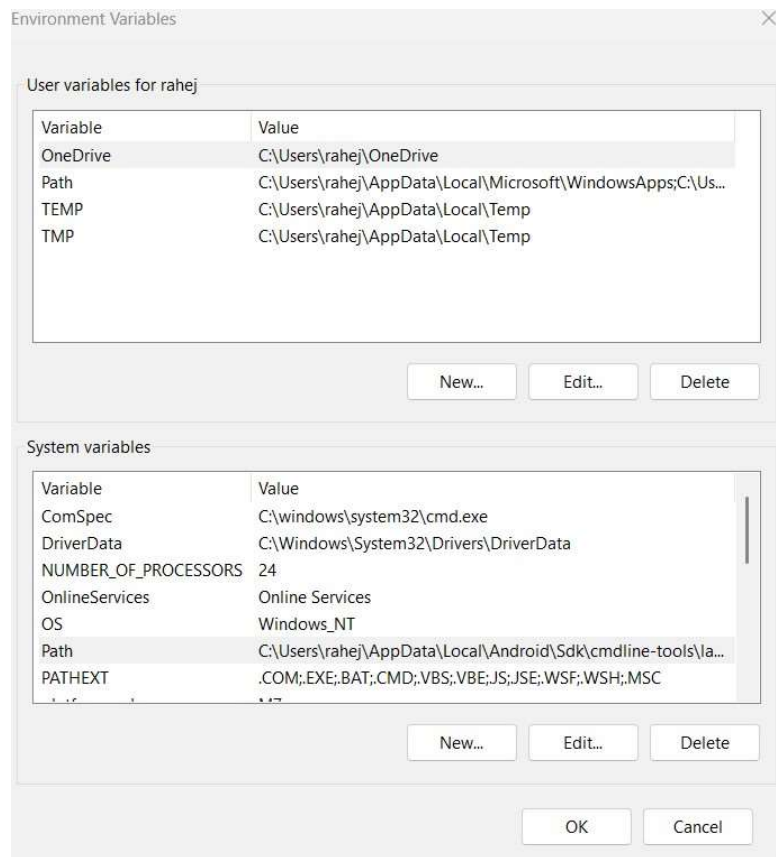
When your download is complete, extract the zip file and place it in the desired installation folder or location, for example, C: /Flutter.

Step 4:

To run the Flutter command in regular windows console, you need to update the system path to include the flutter bin directory. The following steps are required to do this:

Step 4.1:

Go to MyComputer properties -> advanced tab -> environment variables. You will get the following screen.

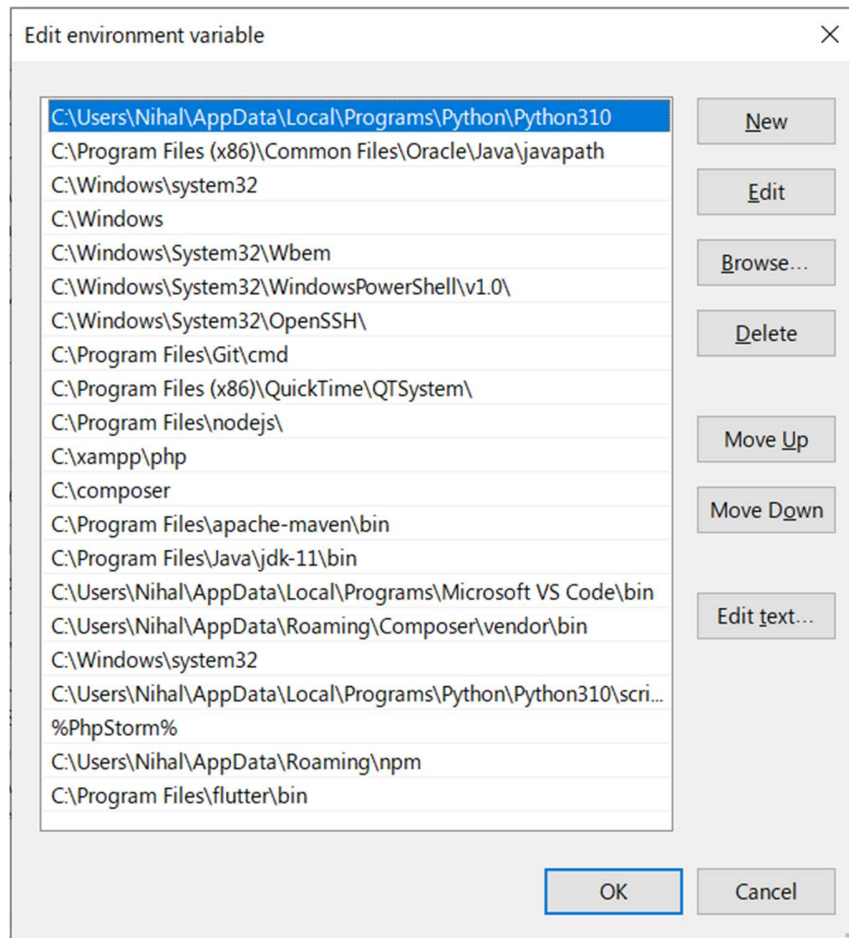


Step 4.2:

Now, select path -> click on edit. The following screen appears

Step 4.3:

In the above window, click on New->write path of Flutter bin folder in variable value - > ok -> ok -> ok.



Step 5:

Now, run the \$ flutter command in command prompt.

```

Windows PowerShell
Copyright (c) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\Nihal> flutter
Manage your Flutter app development.

Common commands:

  flutter create <output directory>
    Create a new Flutter project in the specified directory.

  flutter run [options]
    Run your Flutter application on an attached device or in an emulator.

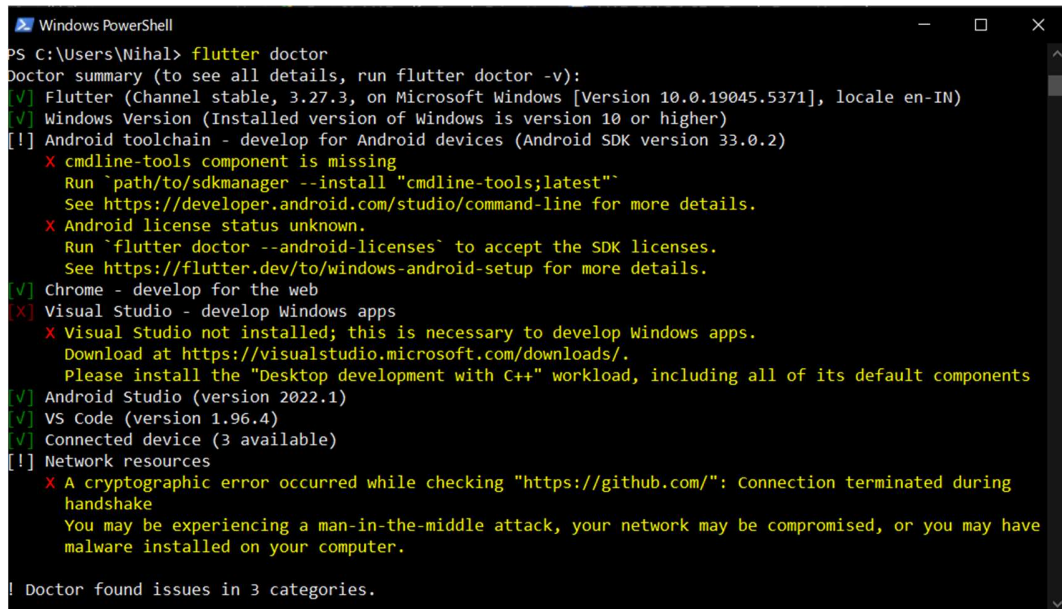
Usage: flutter <command> [arguments]

Global options:
-h, --help                Print this usage information.
-v, --verbose              Noisy logging, including all shell commands executed.
                           If used with "--help", shows hidden options. If used with "flutter doctor",
                           shows additional diagnostic information. (Use "-vv" to force verbose logging
                           in those cases.)
-d, --device-id            Target device id or name (prefixes allowed).
--version                  Reports the version of this tool.
  
```

Now, run the \$ flutter doctor command. This command checks for all the requirements of Flutter app development and displays a report of the status of your Flutter installation.

Step 6:

When you run the above command, it will analyze the system and show its report, as shown in the below image. Here, you will find the details



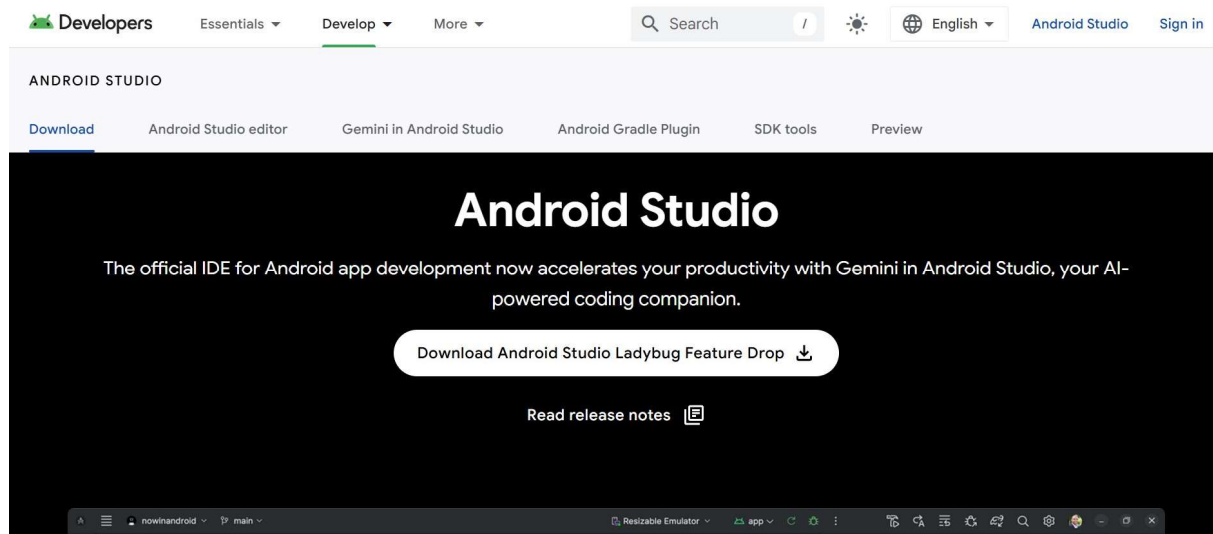
```
PS C:\Users\Nihal> flutter doctor
Doctor summary (to see all details, run flutter doctor -v):
[✓] Flutter (Channel stable, 3.27.3, on Microsoft Windows [Version 10.0.19045.5371], locale en-IN)
[✓] Windows Version (Installed version of Windows is version 10 or higher)
[!] Android toolchain - develop for Android devices (Android SDK version 33.0.2)
    ✗ cmdline-tools component is missing
      Run `path/to/sdkmanager --install "cmdline-tools;latest"`
      See https://developer.android.com/studio/command-line for more details.
    ✗ Android license status unknown.
      Run `flutter doctor --android-licenses` to accept the SDK licenses.
      See https://flutter.dev/to/windows-android-setup for more details.
[✓] Chrome - develop for the web
[✗] Visual Studio - develop Windows apps
    ✗ Visual Studio not installed; this is necessary to develop Windows apps.
      Download at https://visualstudio.microsoft.com/downloads/.
      Please install the "Desktop development with C++" workload, including all of its default components
[✓] Android Studio (version 2022.1)
[✓] VS Code (version 1.96.4)
[✓] Connected device (3 available)
[!] Network resources
    ✗ A cryptographic error occurred while checking "https://github.com/": Connection terminated during
      handshake
      You may be experiencing a man-in-the-middle attack, your network may be compromised, or you may have
      malware installed on your computer.

! Doctor found issues in 3 categories.
```

of all missing tools, which required to run Flutter as well as the development tools that are available but not connected with the device.

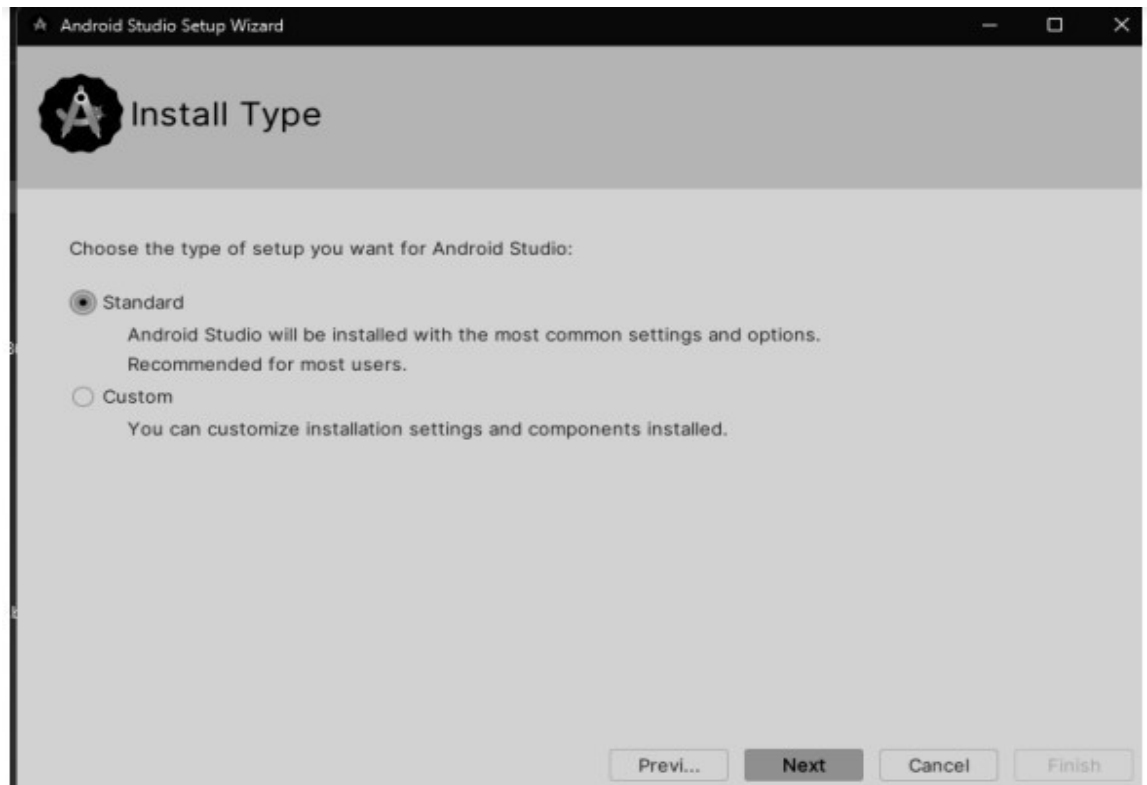
Step 7:

Install the Android SDK. If the flutter doctor command does not find the Android SDK tool in your system, then you need first to install the Android Studio IDE. To install Android Studio IDE, do the following steps.



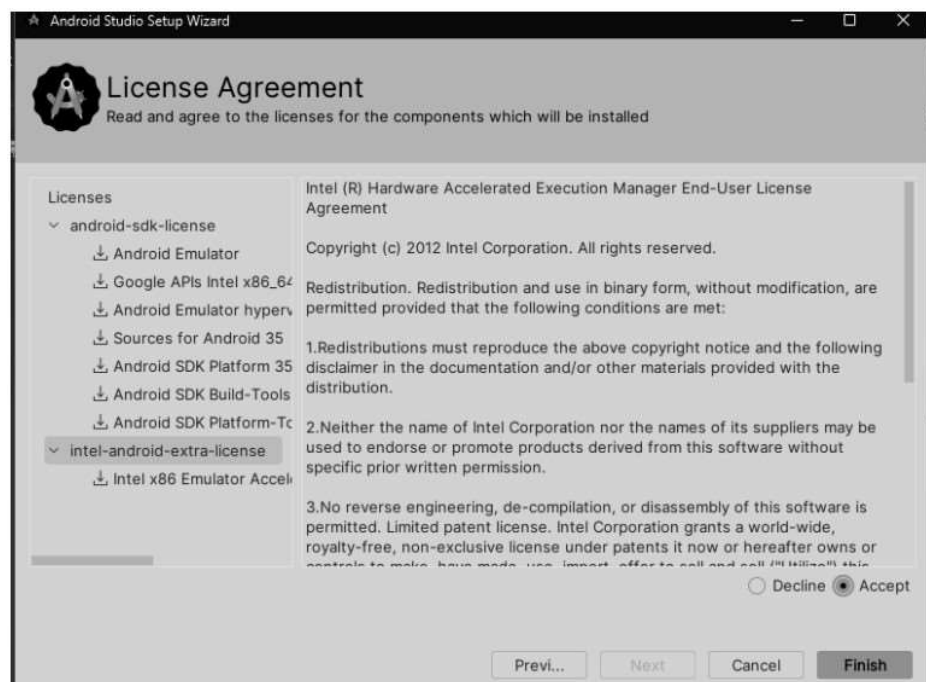
Step 8:

After opening the installer you will see the following. Select standard and click next.



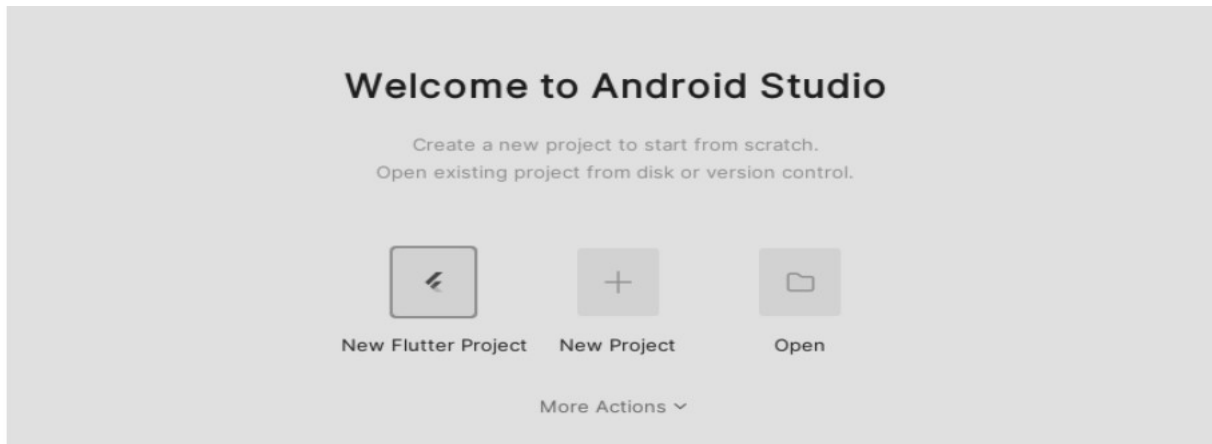
Step 9:

Accept all and finish the installation.



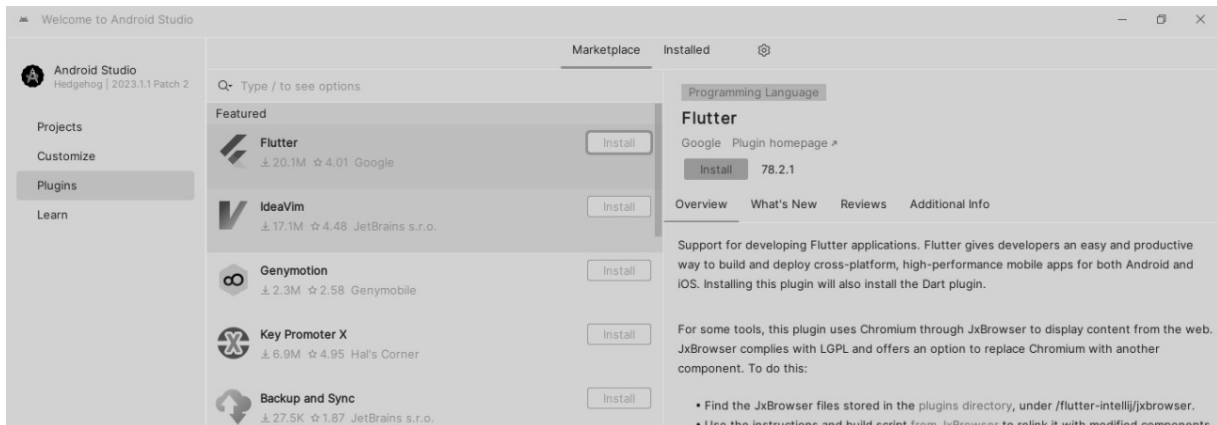
Step 10:
Install Flutter and Dart plugins from Marketplace.

Step 11:
Click on New Flutter Project.



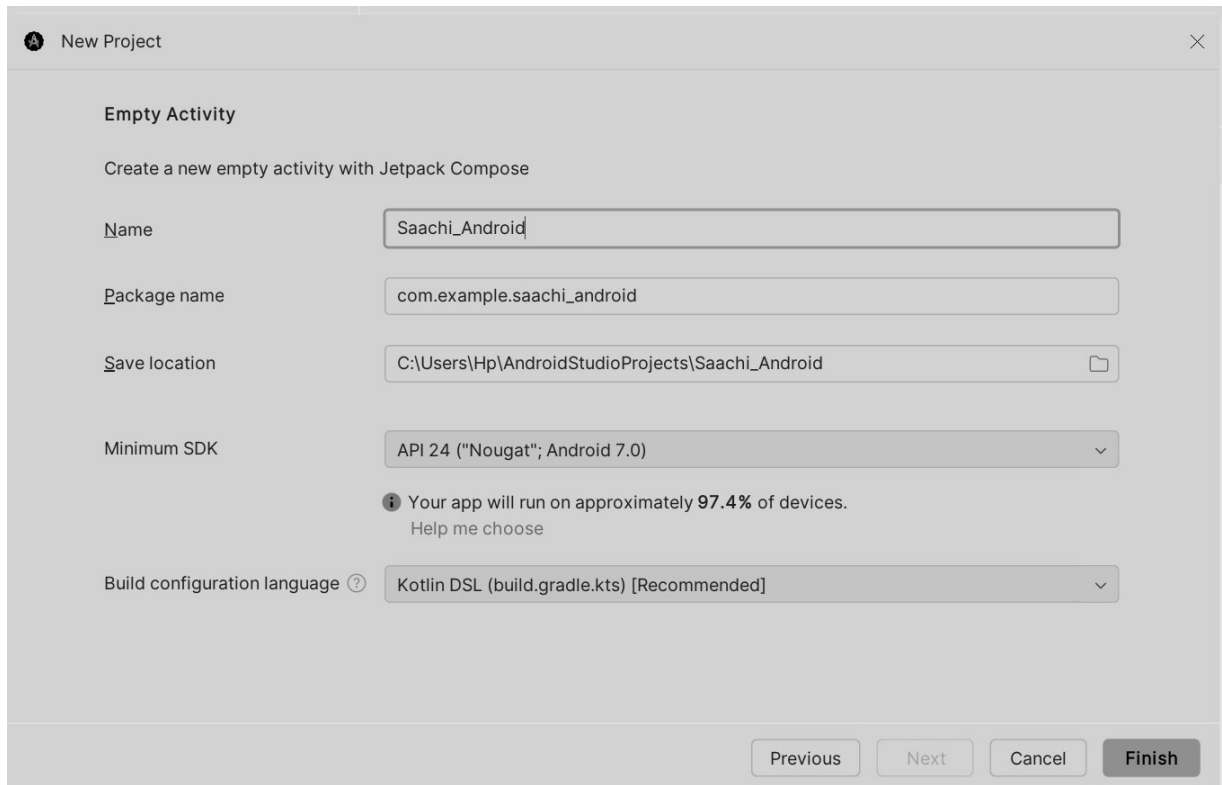
Step 12:
Set path C:\flutter\flutter

Step 13:
Enter a name for project and click on create.



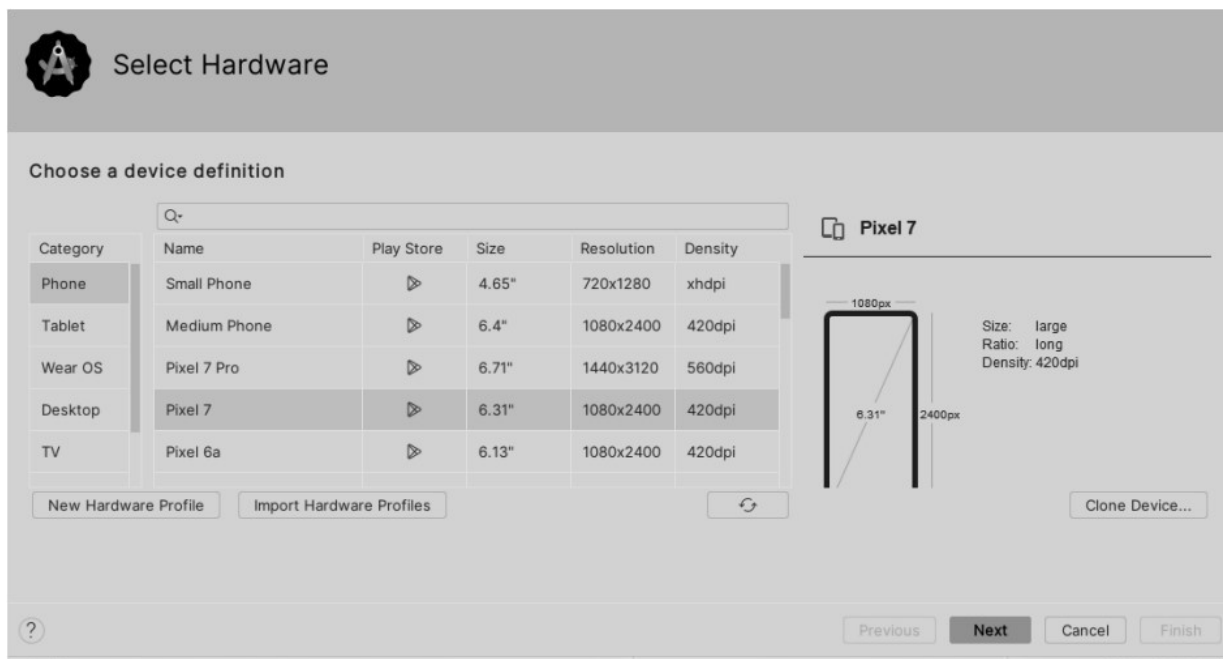
Step 14:

Go to Menu > Tools > Device Manager



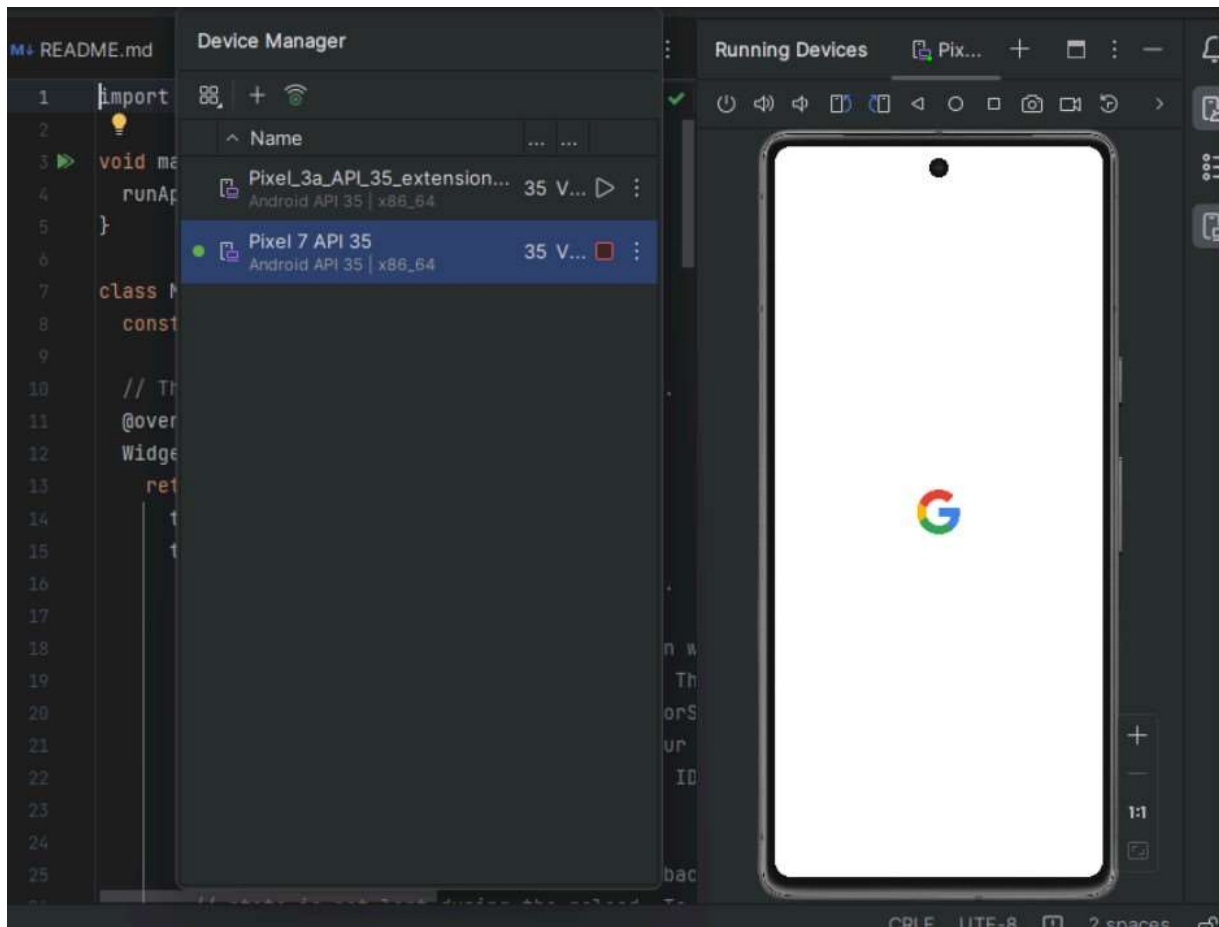
Step 15:

Choose your device on which you want to run your project and click Next.



Step 16 :

Click on play button in the toolbar above and you will see the emulator starting. It will take time to load for the first time.



Conclusion:

Flutter allows developers to build cross-platform applications with a single codebase. The Flutter SDK, Dart programming language, and the right IDE (Android Studio or Visual Studio Code) are essential for setting up the development environment. With tools for fast compilation, real-time changes (Hot Reload), and native-like performance, Flutter makes it easy to create powerful, multi-platform apps.