

Aim: To install and configure Flutter environment.

Theory:

Creating a mobile application is a very complex and challenging task. There are many frameworks available, which provide excellent features to develop mobile applications. For developing mobile apps, Android provides a native framework based on Java and Kotlin language, while iOS provides a framework based on Objective-C/Swift language. Thus, we need two different languages and frameworks to develop applications for both OS. Today, to overcome this complexity, several frameworks have been introduced that support both OS along with desktop apps. These types of the framework are known as **cross-platform** development tools.

The cross-platform development framework has the ability to write one code and can deploy on the various platforms (Android, iOS, and Desktop). It saves a lot of time and development efforts of developers. There are several tools available for cross-platform development, including web-based tools, such as Ionic from Drifty Co. in 2013, Phonegap from Adobe, Xamarin from Microsoft, and React Native from Facebook. Each of these frameworks has varying degrees of success in the mobile industry. Recently, a new framework has been introduced in the cross-platform development family named **Flutter** developed from Google.

Flutter is a UI toolkit for creating fast, beautiful, natively compiled applications for mobile, web, and desktop with one programming language and single codebase. It is free and open-source. It was initially developed from **Google** and now managed by an **ECMA** standard. Flutter apps use Dart programming language for creating an app. Dart **programming** shares several same features as other programming languages, such as Kotlin and Swift, and can be trans-compiled into JavaScript code.

Flutter is mainly optimized for 2D mobile apps that can run on both Android and iOS platforms. We can also use it to build full-featured apps, including camera, storage, geolocation, network, third-party SDKs, and more.

Step 1: Download the Flutter SDK

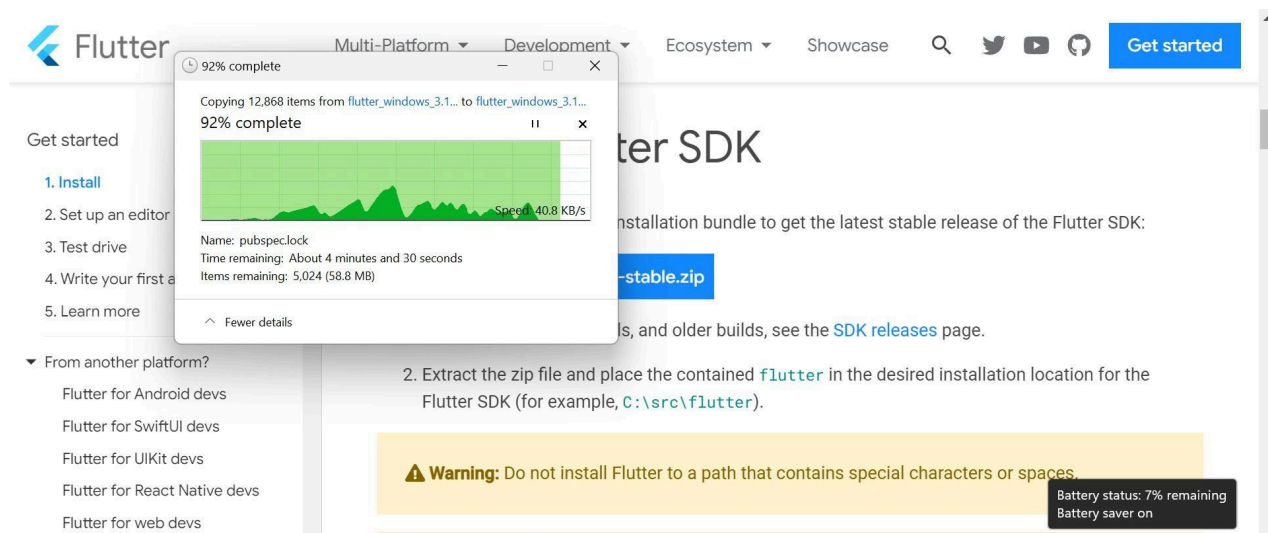
- a. Go to the Flutter download page:
- b. Under the "Get the Flutter SDK" section, click the "Download for Windows" button.
- c. Save the downloaded file to a convenient location on your computer.

The screenshot shows the Flutter website's 'Windows install' page. The top navigation bar includes the Flutter logo, links for Multi-Platform, Development, Ecosystem, and Showcase, a search icon, social media icons, and a 'Get started' button. A blue banner at the top reads: 'Lots has been happening! Check out what's new in Flutter 3.7, watch videos from Flutter Forward, and learn what's next for Flutter!'. The left sidebar lists 'Get started' steps: 1. Install (highlighted), 2. Set up an editor, 3. Test drive, 4. Write your first app, 5. Learn more. Below this is a section 'From another platform?' with links for Android, SwiftUI, and UIKit. The main content area is titled 'Windows install' and includes a breadcrumb 'Get started > Install > Windows'. It features a 'Contents' section with links for 'System requirements', 'Get the Flutter SDK', and 'Update your path'. A 'Set up an editor' link is in the top right.

The screenshot shows the Flutter website's 'Get the Flutter SDK' page. The top navigation bar is identical to the previous screenshot. The left sidebar lists 'Get started' steps: 1. Install (highlighted), 2. Set up an editor, 3. Test drive, 4. Write your first app, 5. Learn more. Below this is a section 'From another platform?' with links for Android, SwiftUI, UIKit, React Native, web, and Xamarin.Forms. The main content area is titled 'Get the Flutter SDK' and contains two numbered steps. Step 1: 'Download the following installation bundle to get the latest stable release of the Flutter SDK:' followed by a blue button labeled 'flutter_windows_3.16.8-stable.zip'. Step 2: 'Extract the zip file and place the contained flutter in the desired installation location for the Flutter SDK (for example, C:\src\flutter).' Two yellow warning boxes are present: 'Warning: Do not install Flutter to a path that contains special characters or spaces.' and 'Warning: Do not install Flutter in a directory like C:\Program Files\ that requires elevated permissions.'

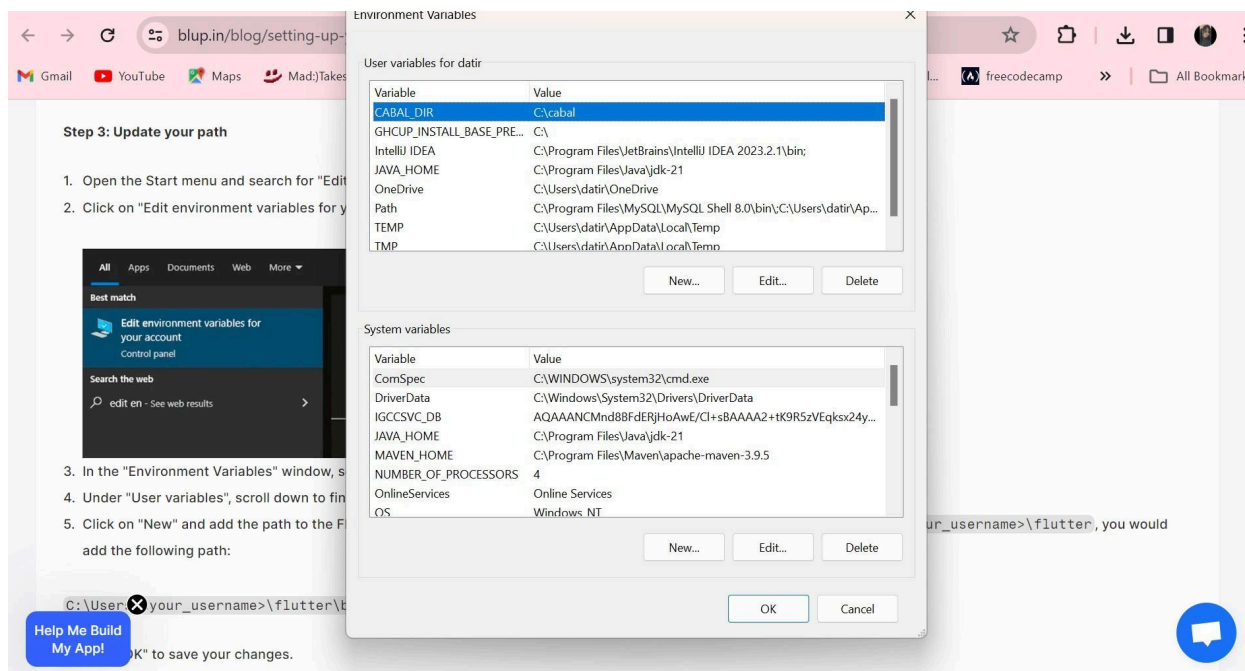
Step 2: Extract the Flutter SDK

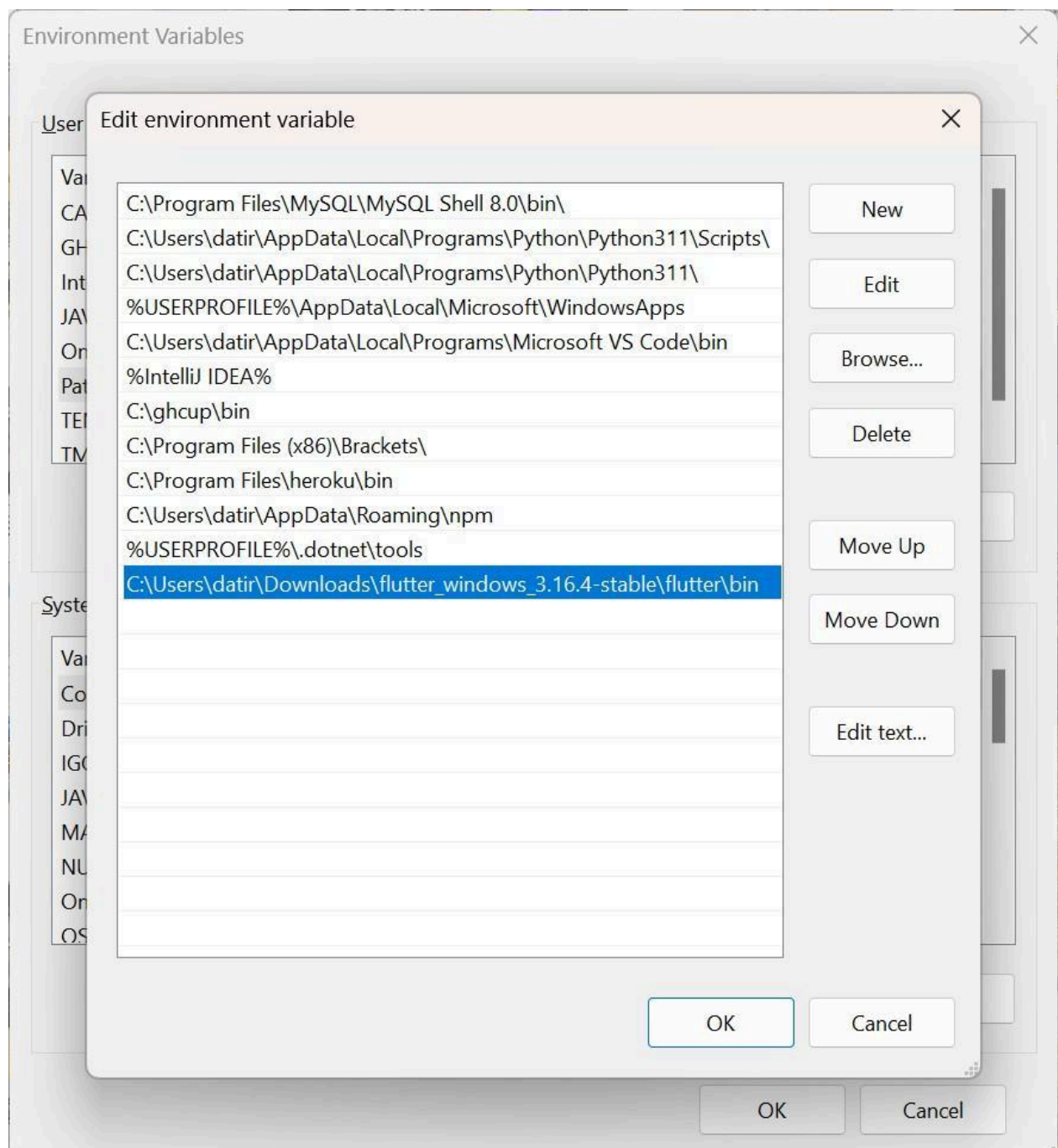
- a. Right-click on the downloaded file and select "Extract All".
- b. In the "Extract Files" window, choose a location where you want to extract the Flutter SDK. For example, you can extract it to C:\Users\<your_username>\flutter.
- c. Click the "Extract" button.



Step 3: Update your path

- Open the Start menu and search for "Edit environment variables for your account".
- Click on "Edit environment variables for your account".





- c. In the "Environment Variables" window, select the "User variables" tab.
- d. Under "User variables", scroll down to find the "Path" variable and click on "Edit".
- e. Click on "New" and add the path to the Flutter SDK's bin directory.

Step 4: Verify the installation

```
C:\Users\Avan>flutter doctor
Doctor summary (to see all details, run flutter doctor -v):
[✓] Flutter (Channel stable, 3.27.3, on Microsoft Windows [Version 10.0.26100.3624], locale en-IN)
[✓] Windows Version (Installed version of Windows is version 10 or higher)
[✓] Android toolchain - develop for Android devices (Android SDK version 35.0.1)
[✓] Chrome - develop for the web
[✓] Visual Studio - develop Windows apps (Visual Studio Build Tools 2022 17.11.5)
[✓] Android Studio (version 2024.2)
[✓] VS Code (version 1.99.1)
[✓] Connected device (3 available)
[✓] Network resources

• No issues found!
```

- a. Open a command prompt window.
- b. Type the following command and press Enter:

flutter doctor

- c. The flutter doctor command will check your system for any missing dependencies or issues with your Flutter installation. If everything is installed correctly, you will see a message similar to the following:

Doctor summary (to show all warnings and errors, use -v or --verbose) [✓] Flutter (Channel stable, v3.16, <https://github.com/flutter/flutter>) [✓] Dart SDK (Version: 2.18.0-197.1) [✓] Android tools [✓] Git [✓] Visual Studio Code (version 1.71.2) ...

Step 5: Install the Android SDK

- a. 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:
- b. Download the latest Android Studio executable or zip file
- c. When the download is complete, open the .exe file and run it. You will get the following dialog box.



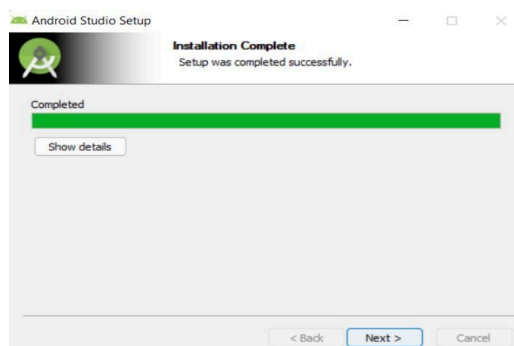
Android Studio downloads

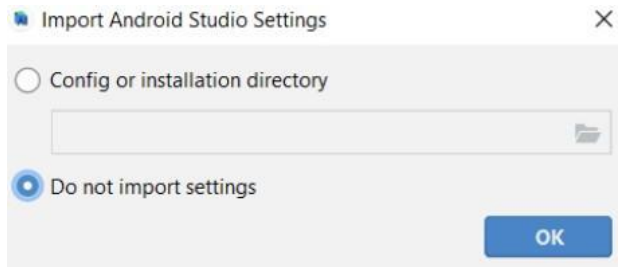
Platform	Android Studio package	Size	SHA-256 checksum
Windows (64-bit)	android-studio-2020.3.1.26-windows.exe Recommended	914 MiB	d9181ae1668fc4a5f3a19aa5a2f9951f022bfff1359a70aa0f0e7987e248c740c
	android-studio-2020.3.1.26-windows.zip No .exe installer	922 MiB	218cc88562f06ddb5c4b61e0d7059d37688e91e9af55ab0a7bd2c0485050bd4b



d. Follow the steps of the installation wizard. Once the installation wizard completes, you will get the following screen.

e. In the above screen, click Next -> Finish. Once the Finish button is clicked, you need to choose the 'Don't import Settings option' and click OK. It will start the Android Studio.





f. Run the \$ flutter doctor command and Run flutter doctor --android-licenses command

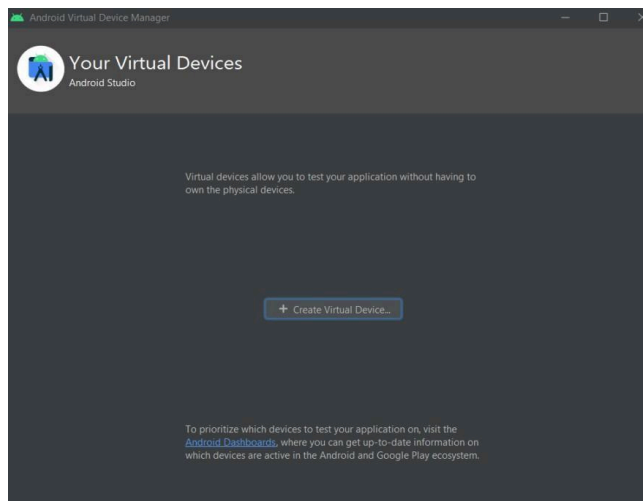
```
Doctor summary (to see all details, run flutter doctor -v):
[✓] Flutter (Channel stable, 2.8.1, on Microsoft Windows [Version 10.0.22000.434], locale en-IN)
[✓] Android toolchain - develop for Android devices (Android SDK version 32.0.0)
[✓] Chrome - develop for the web
[✓] Android Studio (version 2020.3)
[✓] Connected device (2 available)

• No issues found!
```

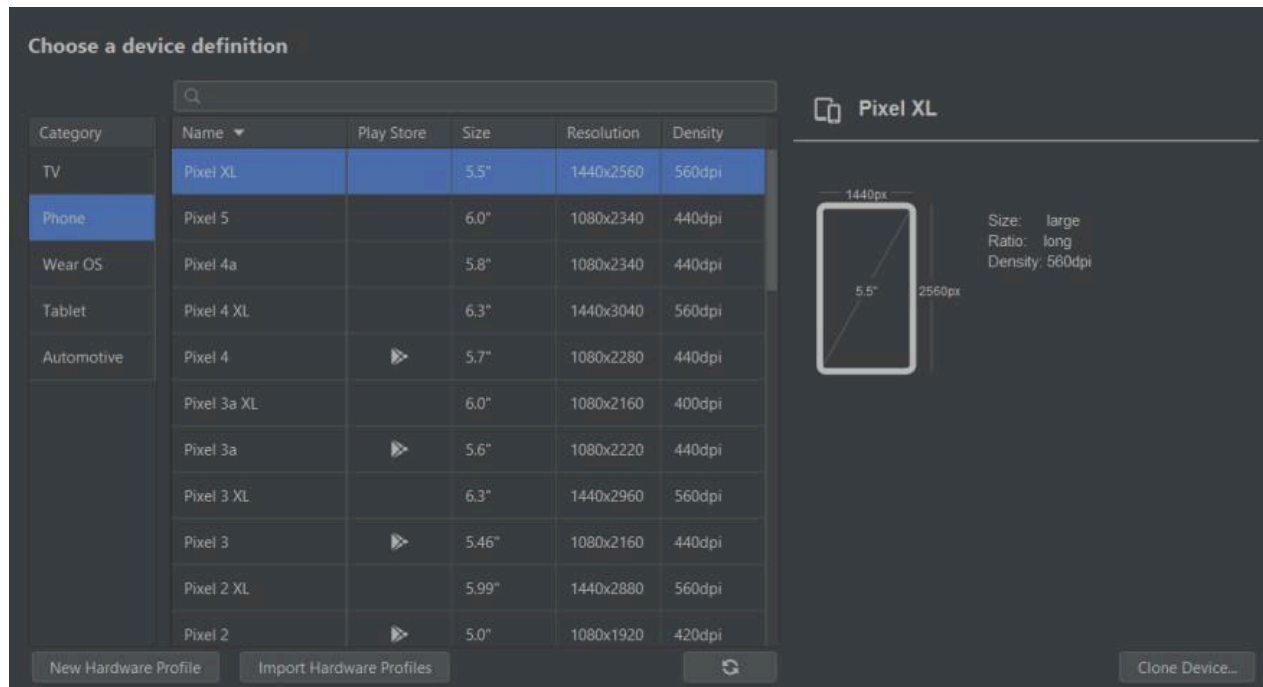
Step 6: Set Up Android Emulator

To set an Android emulator, go to Android Studio -> Tools -> Android -> AVD Manager and select Create Virtual Device. Or, go to Help -> Find Action -> Type Emulator in the search box.

You will get the following screen

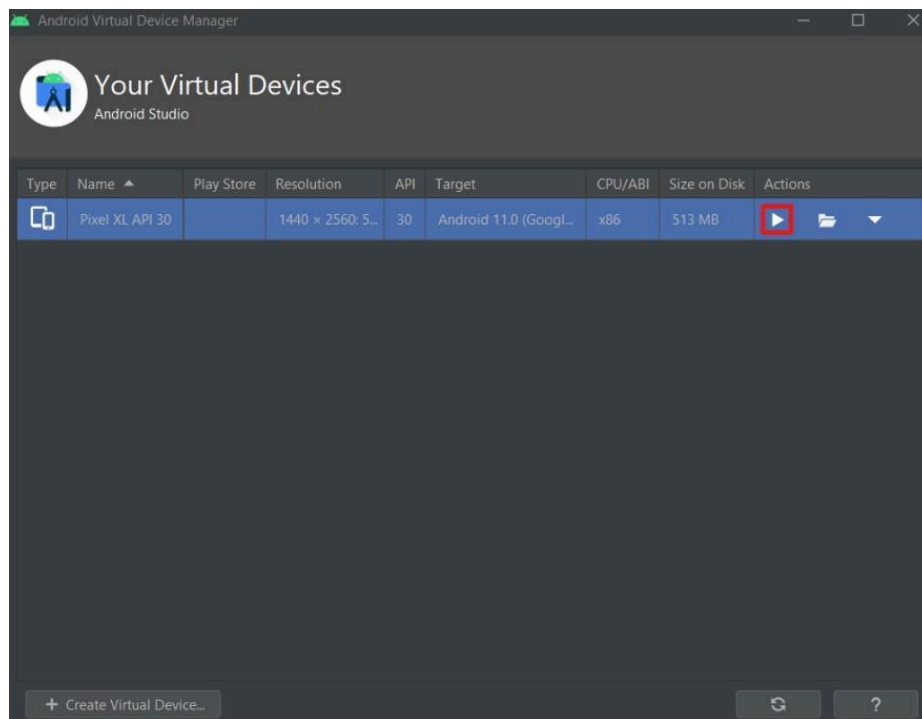


b. Choose your device definition and click on Next.

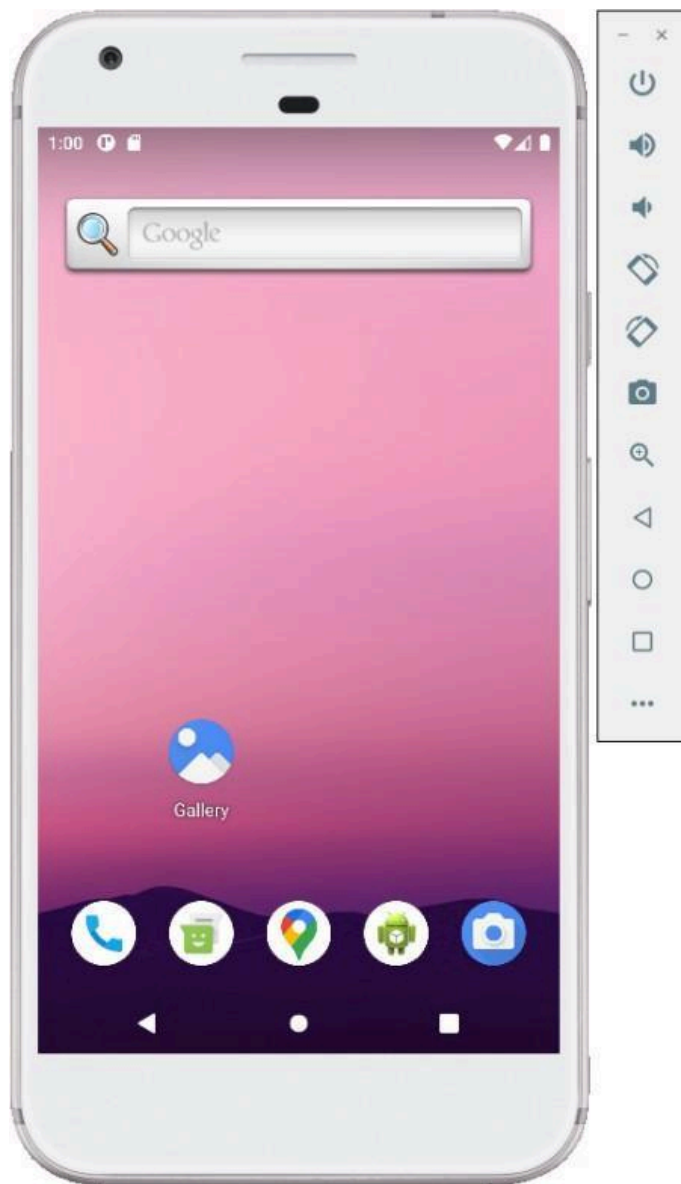


c. Select the system image for the latest Android version and click on Next.

d. Now, verify the all AVD configuration. If it is correct, click on Finish. The following screen appears.



Last, click on the icon pointed into the red color rectangle. The Android emulator displayed as shown below screen.



Conclusion: Thus we have successfully installed and configured Flutter environment