

# EXP 1: Installation and Configuration of Flutter Environment.

**Aim:** To install and configure Flutter and Android Studio in our system. **Theory:**

## What is Flutter?

Flutter is an open-source UI software development kit created by Google. It is used to develop cross platform applications from a single codebase for any web browser, Fuchsia, Android, iOS, Linux, macOS, and Windows.

With the rise in technology and the availability of smartphones, many startups find it easy to connect with users and clients via apps. The app market has also grown in the last few years and is expected to grow exponentially in the coming decade. The app development market has also been on a rise and has allowed countless app developers to exhibit their skills and find a suitable job. With this shift into apps, much development, and research have been done to deliver the best and to make the app development process faster and much simpler.

### Features:

- **Open-Source:** Flutter is a free and open-source framework for developing mobile applications.
- **Cross-platform:** This feature allows Flutter to write the code once, maintain, and can run on different platforms. It saves the time, effort, and money of the developers.
- **Hot Reload:** Whenever the developer makes changes in the code, then these changes can be seen instantaneously with Hot Reload. It means the changes are immediately visible in the app itself. It is a very handy feature, which allows the developer to fix the bugs instantly.
- **Minimal code:** Flutter app is developed by Dart programming language, which uses JIT and AOT compilation to improve the overall start-up time, functioning and accelerates the performance. JIT enhances the development system and refreshes the UI without putting extra effort into building a new one.
- **Widgets:** The Flutter framework offers widgets, which are capable of developing customizable specific designs. Most importantly, Flutter has two sets of widgets: Material Design and Cupertino widgets that help to provide a glitch-free experience on all platforms.

### Advantages:

- **Fast Development:** Flutter's fast development cycle allows developers to see changes to the app in real-time as they make modifications to the code. This can greatly increase the speed and efficiency of the development process of the applications.
- **Beautiful User Interfaces:** Flutter provides a rich set of customizable widgets that can be used to create beautiful and user-friendly interfaces. The framework also offers a strong emphasis on design and visual appeal, making it an attractive choice for app development projects that require a high degree of visual appeal.
- **High Performance:** Flutter offers fast and smooth animations and transitions, and is designed to run smoothly on older devices. The framework is optimized for performance, making it an attractive choice for demanding mobile applications. As a result the number

of targeted users increases.

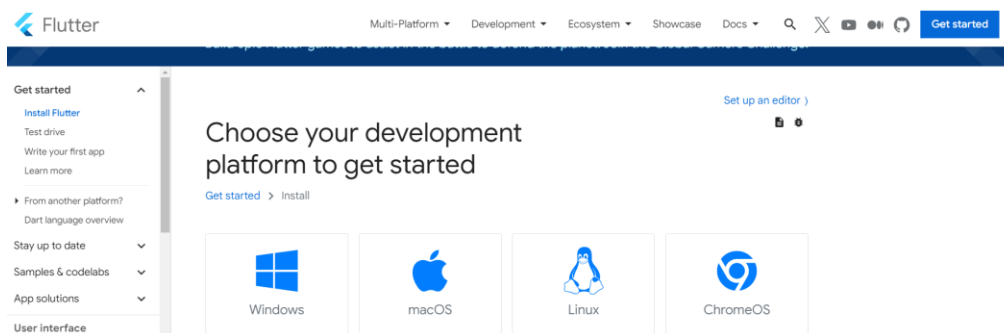
- **Cross-Platform Development:**Flutter supports not only mobile app development but also web and desktop app development. This makes it a versatile tool for developing applications that need to run on multiple platforms without any issues.
- **Open-Source:**Flutter is a free and open-source framework, making it accessible to a wide range of developers and companies. The large community of developers and users working with the framework helps to ensure that it continues to evolve and expand its capabilities.

## Disadvantages of flutter:

- However, since it is coded in Dart language, a designer needs to learn a new dialect, although it is not difficult to learn.
- Current system attempts to isolate rationale and UI however much as could be expected at the same time, in Shudder, UI and rationale are intermixed. We can beat this utilizing savvy coding and utilizing significant level modules to isolate UI and rationale.

## Install the Flutter SDK

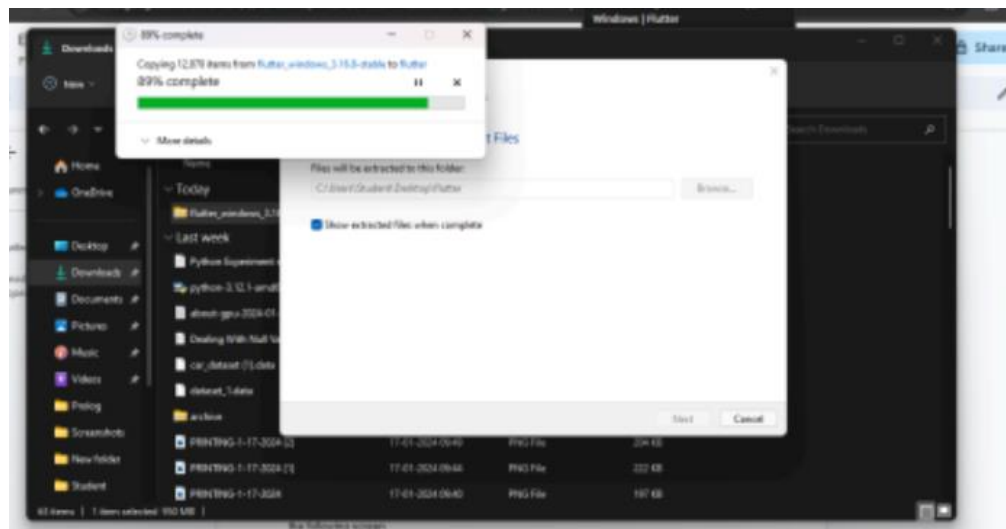
**Step 1:** Download the installation bundle of the Flutter Software Development Kit for windows. To download Flutter SDK, Go to its official website <https://docs.flutter.dev/get-started/install> , you will get the following screen.



**Step 2:** Next, to download the latest Flutter SDK, click on the Windows icon. Here, you will find the download link for SDK.

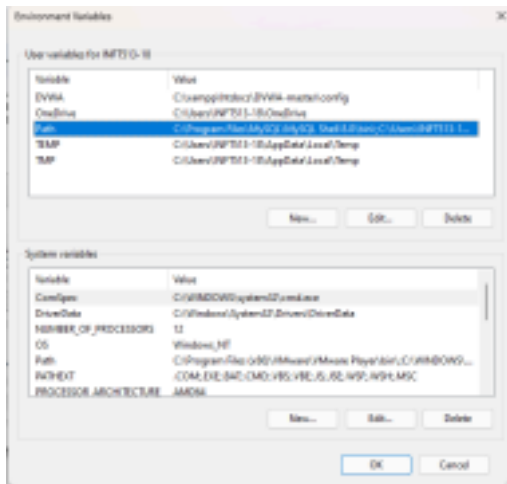


**Step 3:** When your download is complete, extract the zip file and place it in the desired installation folder or location, for example, C: /Flutter.

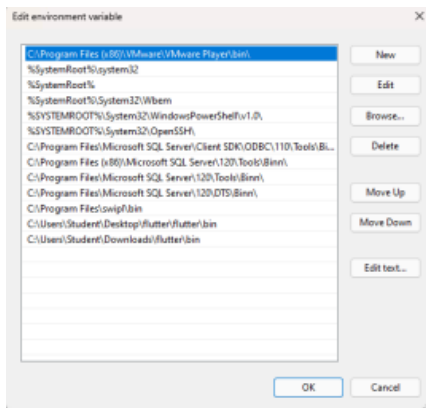


**Step 4:** To run the Flutter command in the regular windows console, you need to update the system path to include the flutter bin directory. The following steps are required to do this:

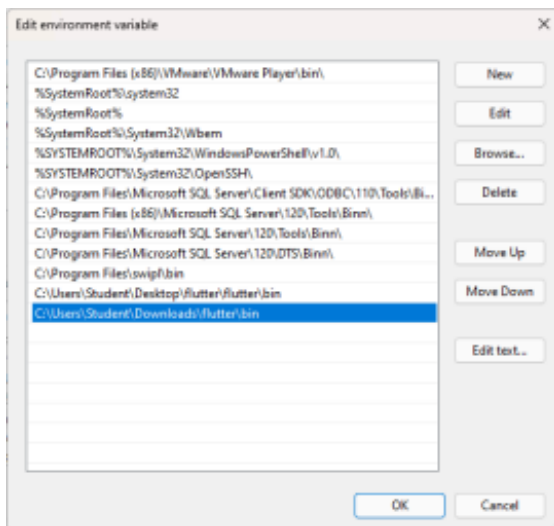
**Step 4.1:** Go to MyComputer properties -> advanced tab -> environment variables. You will get the following screen.



**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.

Now, run the \$ flutter doctor command. This command checks for all the requirements of

```
Command Prompt - flutter
The Flutter tool uses Google Analytics to anonymously report feature usage
statistics and basic crash reports. This data is used to help improve
Flutter tools over time.

Flutter tool analytics are not sent on the very first run. To disable
reporting, type 'flutter config --no-analytics'. To display the current
setting, type 'flutter config'. If you opt out of analytics, an opt-out
event will be sent, and then no further information will be sent by the
Flutter tool.

By downloading the Flutter SDK, you agree to the Google Terms of Service.
The Google Privacy Policy describes how data is handled in this service.

Moreover, Flutter includes the Dart SDK, which may send usage metrics and
crash reports to Google.

Read about data we send with crash reports:
https://flutter.dev/docs/reference/crash-reporting

See Google's privacy policy:
https://policies.google.com/privacy

To disable animations in this tool, use 'flutter config --no-animations'.

The Flutter CLI developer tool uses Google Analytics to report usage and diagnostic
data along with package dependencies, and crash reporting to send basic crash
reports. This data is used to help improve the Dart platform, Flutter framework,
and related tools.

Telemetry is not sent on the very first run. To disable reporting of telemetry,
run this terminal command:

  flutter --disable-analytics

If you opt out of telemetry, an opt-out event will be sent, and then no further
information will be sent. This data is collected in accordance with the Google
Privacy Policy (https://policies.google.com/privacy).

You have received two consent messages because the Flutter tool is migrating to a new analytics system. Disabling
analytics collection will disable both the legacy and new analytics collection systems. You can disable analytics
```

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

```
Command Prompt - flutter
Microsoft Windows [Version 10.0.22621.2281]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Tanvi>Flutter doctor
Doctor summary (to see all details, run flutter doctor -v):
[✓] Flutter (Channel stable, 3.16.8, on Microsoft Windows [Version 10.0.22621.2281], locale en-IN)
[✓] Windows Version (Installed version of Windows is version 10 or higher)
[X] Android toolchain - develop for Android devices
    X Unable to locate Android SDK.
      Install Android Studio from: https://developer.android.com/studio/index.html
      Or first launch it will assist you in installing the Android SDK components.
      (or visit https://flutter.dev/docs/get-started/install/windows#android-setup for detailed instructions).
      If the Android SDK has been installed to a custom location, please use
      'flutter config --android-sdk' to update to that location.

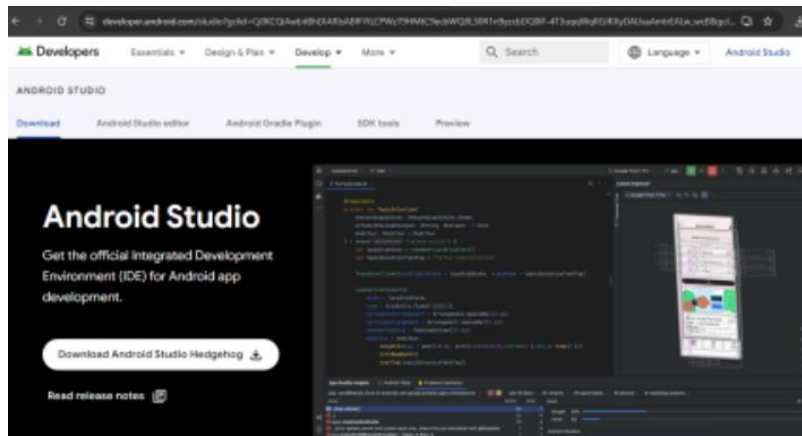
[✓] Chrome - develop for the web
[!] Visual Studio - develop Windows apps (Visual Studio Build Tools 2019 16.11.20)
    X The current Visual Studio installation is incomplete.
      Please use Visual Studio Installer to complete the installation or reinstall Visual Studio.
[!] Android Studio (not installed)
[✓] VS Code (version 1.85.1)
[✓] Connected device (3 available)
[✓] Network resources

! Doctor found issues in 3 categories.

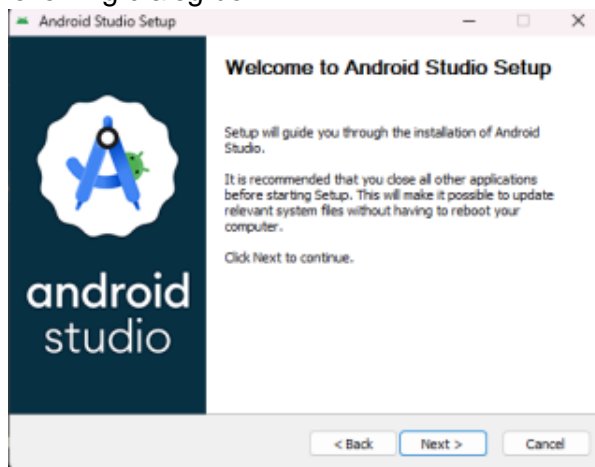
C:\Users\Tanvi>
```

**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.

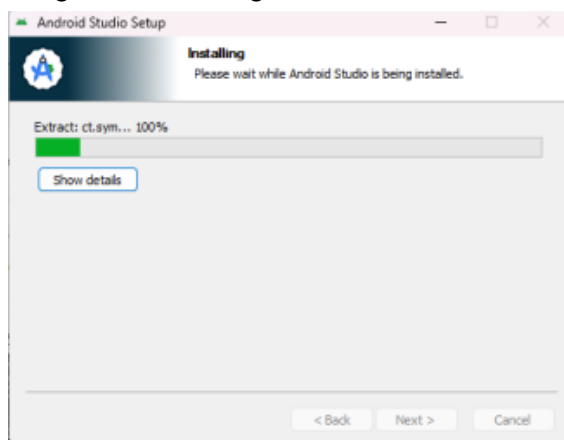
**Step 7.1:** Download the latest Android Studio executable or zip file from the official site.



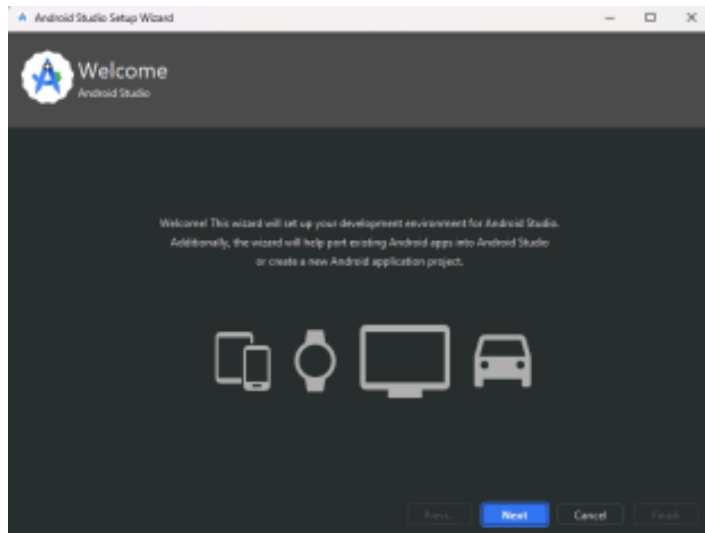
**Step 7.2:** When the download is complete, open the .exe file and run it. You will get the following dialog box.



**Step 7.3:** Follow the steps of the installation wizard. Once the installation wizard completes, you will get the following screen.



**Step 7.4:** 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.



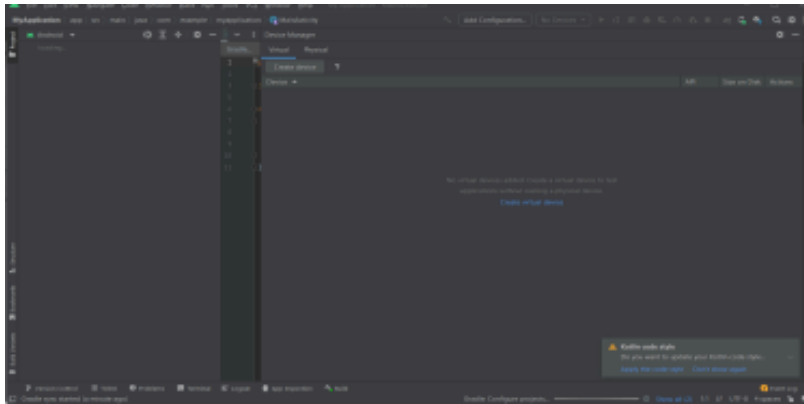
**Step 7.5:** run the `$ flutter doctor` command and Run `flutter doctor --android-licenses` command.

```
Doctor summary (to see all details, run flutter doctor -v):
[✓] Flutter (Channel stable, 3.16.8, on Microsoft Windows [Version 10.0.22621.2283], locale en-IN)
[✓] Windows Version (Installed version of Windows is version 10 or higher)
[!] Android toolchain - develop for Android devices (Android SDK version 34.0.8)
    X cmdline-tools component is missing
      Run 'path/to/sdkmanager --install "cmdline-tools;latest"'
      See https://developer.android.com/studio/command-line for more details.
    X Android license status unknown.
      Run 'flutter doctor --android-licenses' to accept the SDK licenses.
      See https://flutter.dev/docs/get-started/install/windows#android-setup for more details.
[✓] Chrome - develop for the web
[!] Visual Studio - develop Windows apps (Visual Studio Build Tools 2019 16.11.30)
    X The current Visual Studio installation is incomplete.
      Please use Visual Studio Installer to complete the installation or reinstall Visual Studio.
[✓] Android Studio (version 2023.1)
[✓] VS Code (version 1.85.1)
[✓] Connected device (3 available)
[✓] Network resources

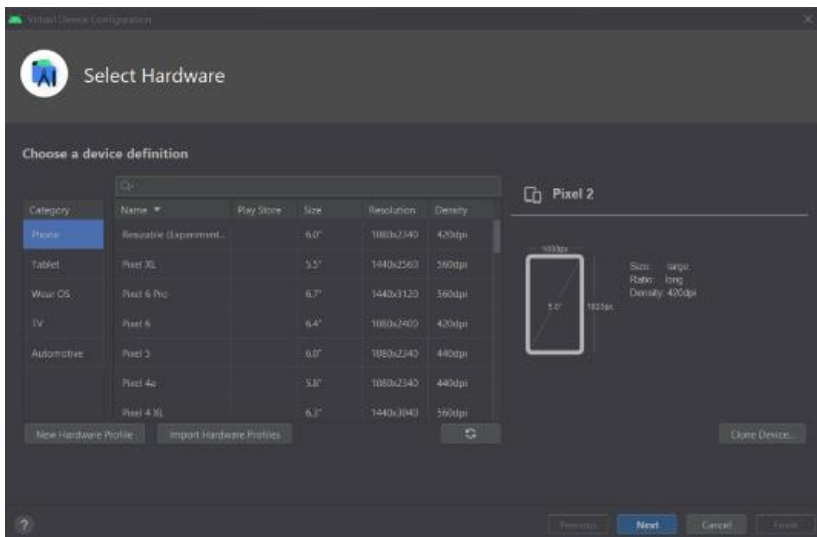
Doctor found issues in 2 categories.
```

**Step 8:** Next, you need to set up an Android emulator. It is responsible for running and testing the Flutter application.

**Step 8.1:** 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.



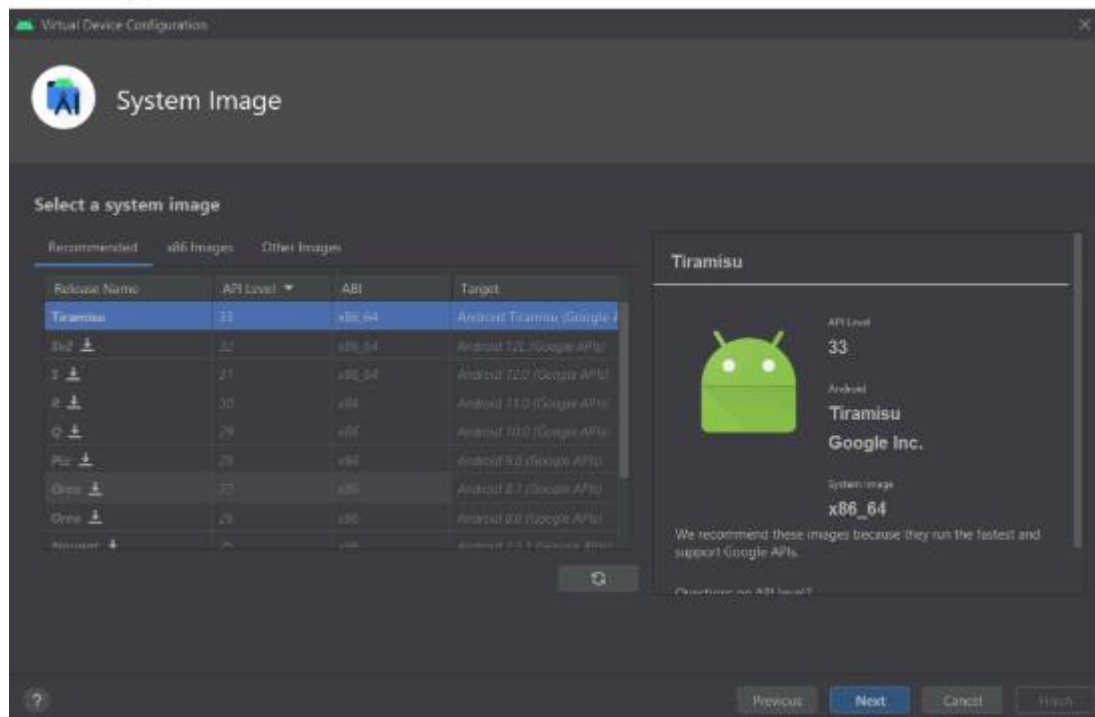
**Step 8.2:** Choose your device definition and click on Next.



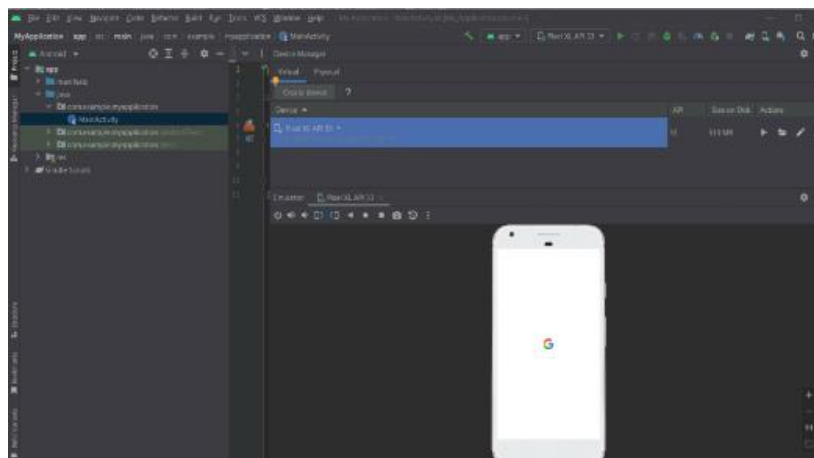
**Step 8.3:** Select the system image for the latest Android version and click on Next.

**Step 8.4:** Now, verify the all AVD configuration. If it is correct, click on Finish. The following screen appears.



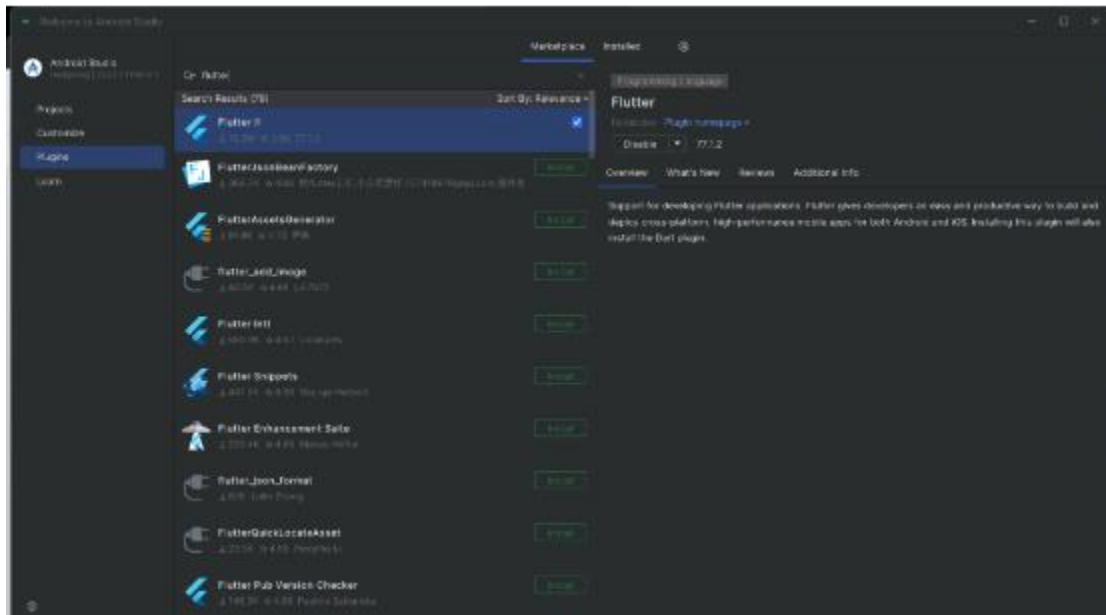


**Step 8.5:** Last, click on the icon pointed into the red color rectangle. The Android emulator displayed as below screen.



**Step 9:** Now, install Flutter and Dart plugin for building Flutter application in Android Studio. These plugins provide a template to create a Flutter application, give an option to run and debug Flutter application in the Android Studio itself. Do the following steps to install these plugins.

**Step 9.1:** Open the Android Studio and then go to File->Settings->Plugins.



**Step 9.2:** Now, search the Flutter plugin. If found, select Flutter plugin and click install. When you click on install, it will ask you to install the Dart plugin as shown below screen. Click yes to proceed.

**Step 9.3:** Restart the Android Studio.

### Conclusion:

In conclusion, successfully establishing the Flutter environment not only streamlines development but also sets the stage for creating dynamic and cross-platform applications. With the robust configuration in place, the journey ahead promises innovation and efficiency in crafting cutting-edge mobile experiences.