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EXP 1: Installation and Configuration of Flutter Environment.

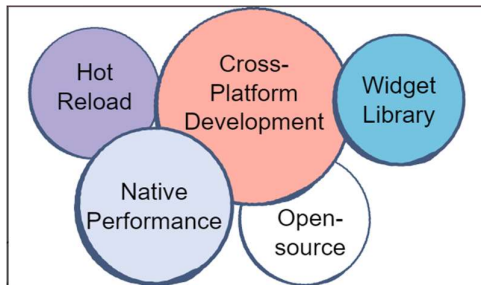
Aim: To install and configure Flutter and Android Studio in our system.

Theory:

Flutter :

Flutter is a valuable modern tool used to create stunning cross-platform applications that render native code on each device and OS. Flutter is compatible with Android, iOS, Linux, macOS, Windows, etc

Features of flutter :



Some of the top features of Flutter include:

- **Dart programming language:** Flutter uses the Dart programming language, which is easy to learn and allows you to develop high-quality apps.
- **Hot reload:** Flutter's "hot reload" feature lets you quickly and easily make changes to your app without restarting it.
- **Expressive and flexible UI:** Flutter's UI elements are built using the same principles as Google's Material Design guidelines, giving you an expressive and flexible way to create beautiful apps.
- **Native performance:** Flutter apps are compiled to native code, giving you the best possible performance on both iOS and Android.
- **Open source:** Flutter is an open-source project, which means you can use it for free and contribute to the platform's development.

Advantages of Flutter :

1. 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.

2. 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.

3. 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.

4. 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.

5. 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 :

1. Limited Third-Party Libraries

While Flutter has a growing number of packages and plugins available, the framework is still relatively new, and the number of third-party libraries available for it is limited compared to more established frameworks such as React Native.

2. Steep Learning Curve

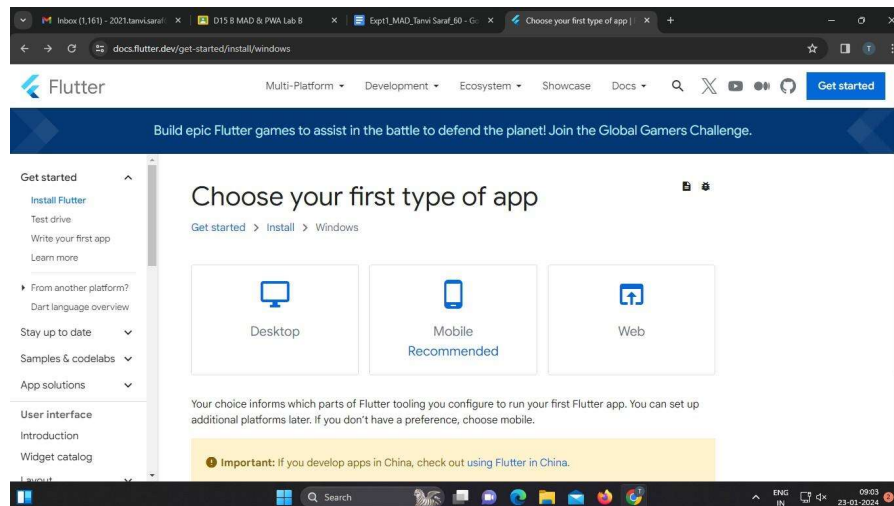
The Dart programming language used by Flutter can be challenging for some developers, and there may be a steep learning curve for those who are not already familiar with it.

3. Limited Corporate Adoption

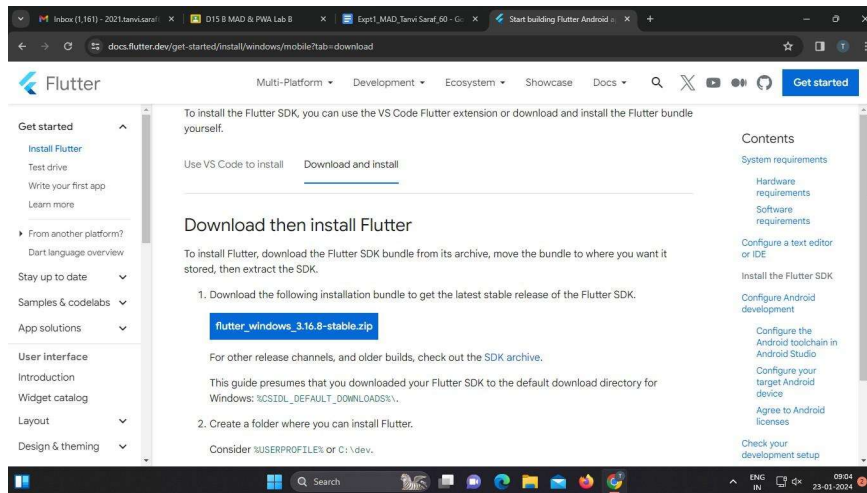
While Flutter has gained significant traction in the development community, it is still relatively new, and its adoption by large corporations is limited compared to more established frameworks.

Install the Flutter SDK

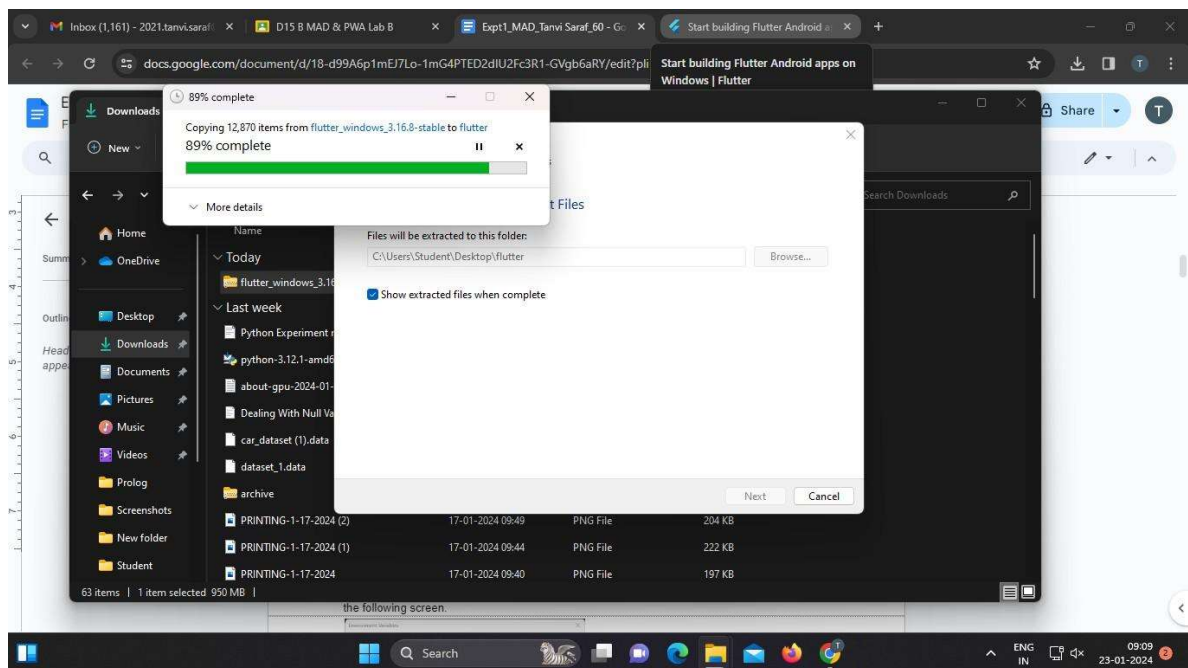
Step 1: Download the installation bundle of the Flutter Software Development Kit for windows. To download Flutter SDK, Go to its official website <https://docs.flutter.dev/get-started/install> , you will get the following screen.



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

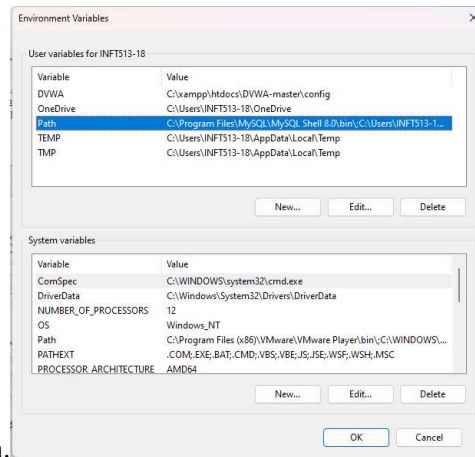


Step 3: When your download is complete, extract the zip file and place it in the desired installation folder or location, for example, C: /Flutter.



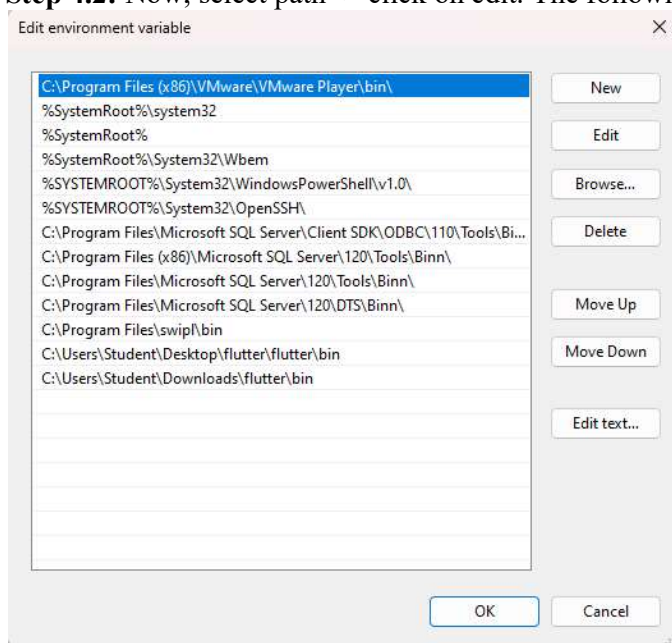
Step 4: To run the Flutter command in regular windows console, you need to update the system path to include the flutter bin directory. The following steps are required to do this:

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

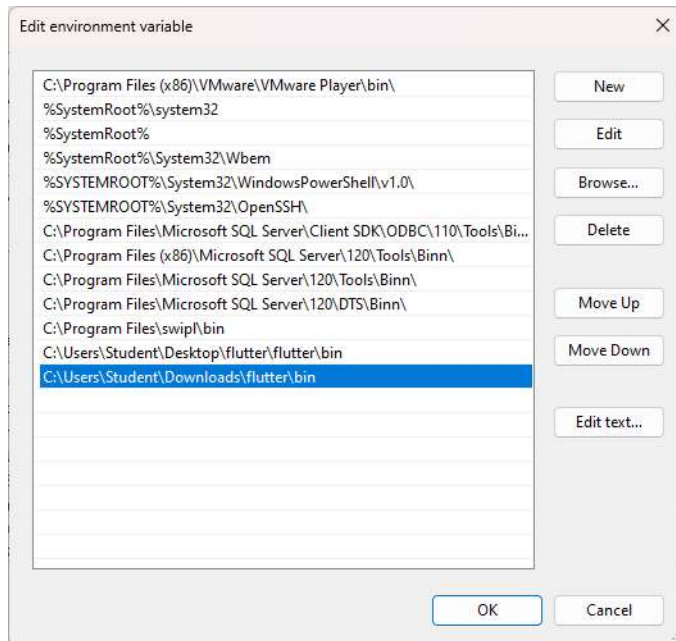


the following screen.

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 Flutter app development and displays a report of the status of your Flutter installation.

```
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.

```

C:\Program Prompt - flutter di x + ~
Microsoft Windows [Version 10.0.22621.2283]
(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 10.0.22621.2283], locale en-IN)
[✓] Windows Version (Installed version of Windows is version 10 or higher)
[✗] Android toolchain - develop for Android devices
    ✗ Unable to locate Android SDK.
       Install Android Studio from: https://developer.android.com/studio/index.html
       On 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 16.11.30)
    ✗ 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

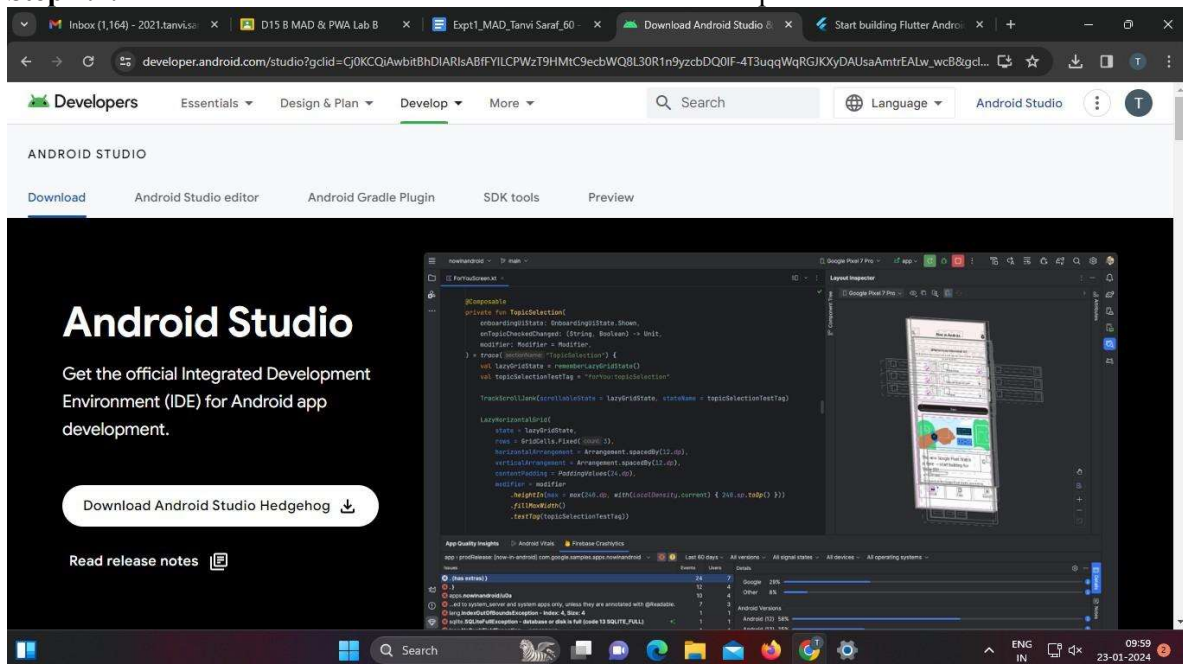
! Doctor found issues in 3 categories.

C:\Users\Tanvi>

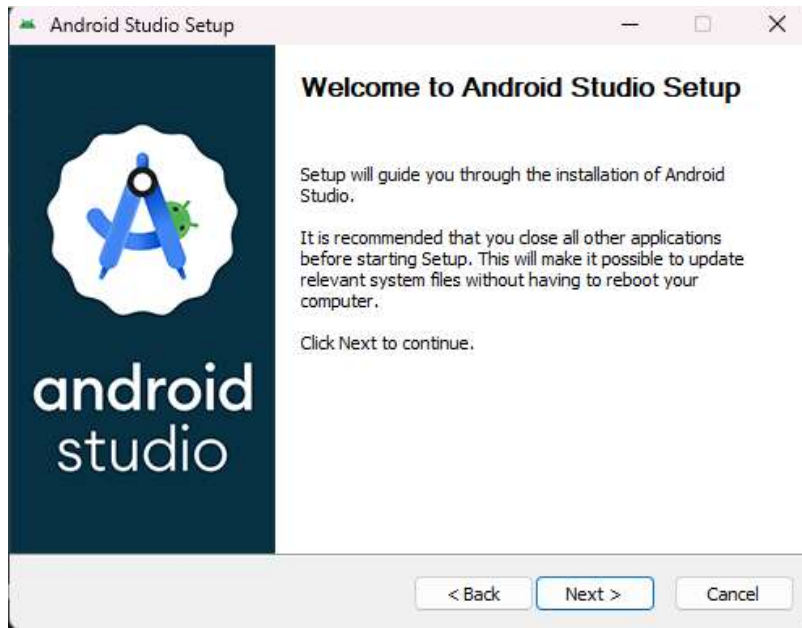
```

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.

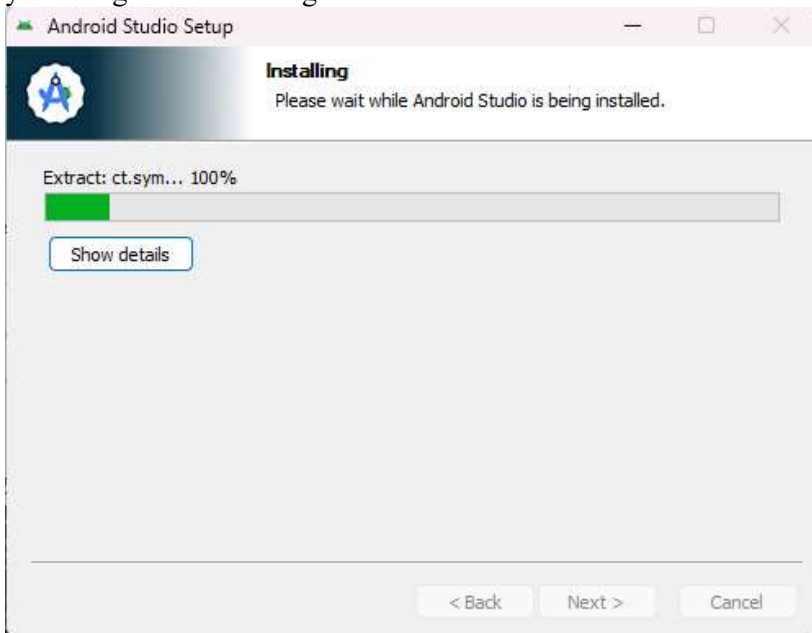
Step 7.1: Download the latest Android Studio executable or zip file from the official site.



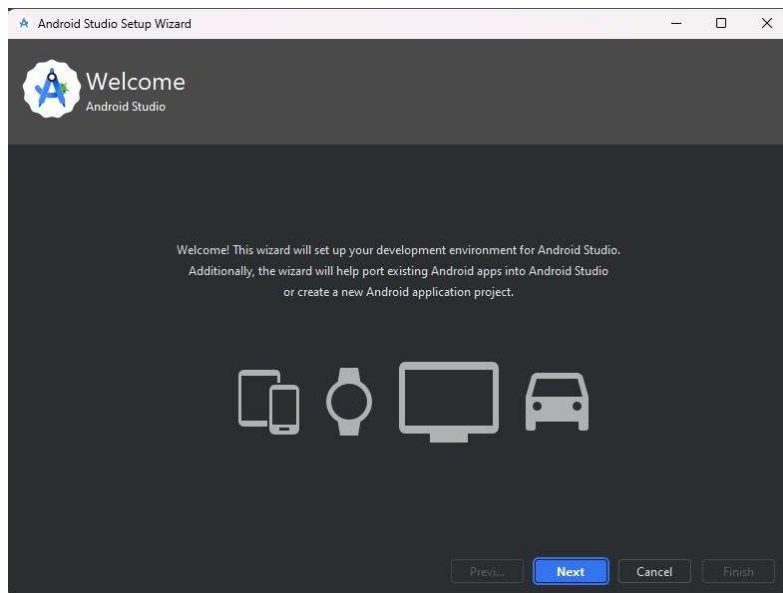
Step 7.2: When the download is complete, open the .exe file and run it. You will get the following dialog box.



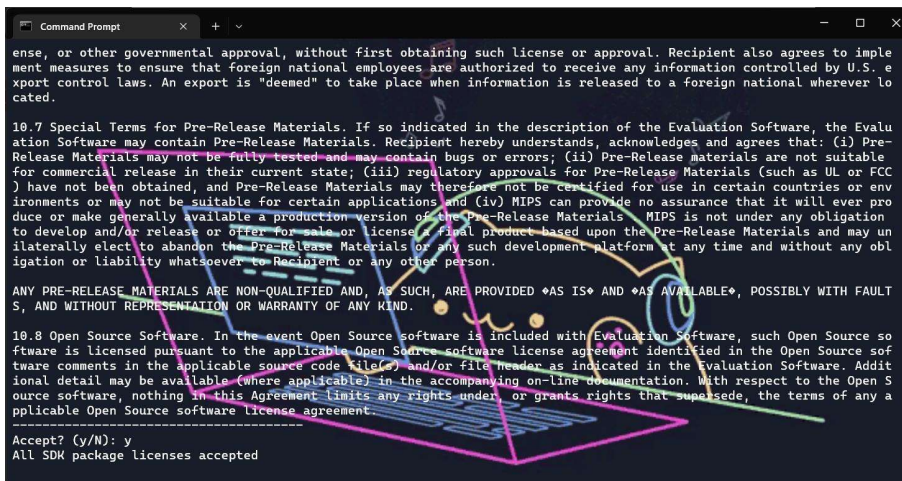
Step 7.3: Follow the steps of the installation wizard. Once the installation wizard completes, you will get the following screen.



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.



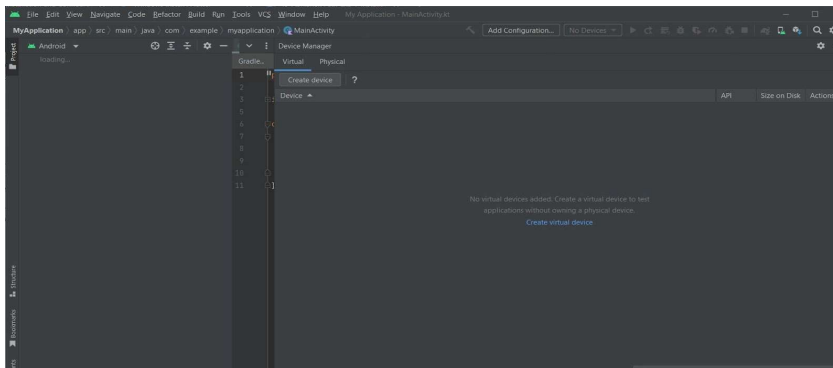

```
Command Prompt - flutter di x + v
Microsoft Windows [Version 10.0.22621.2283]
(c) Microsoft Corporation. All rights reserved.

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 10.0.22621.2283], locale en-IN)
[✓] Windows Version (Installed version of Windows is version 10 or higher)
[!] Android toolchain - develop for Android devices (Android SDK version 34.0.0)
    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

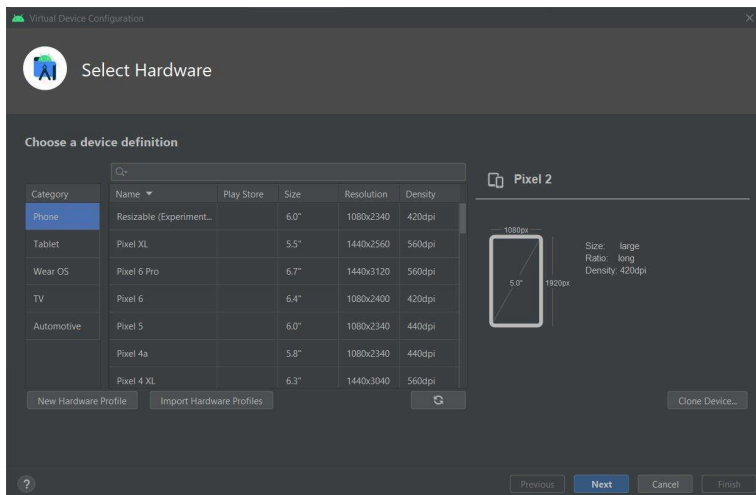
! Doctor found issues in 2 categories.
```

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.

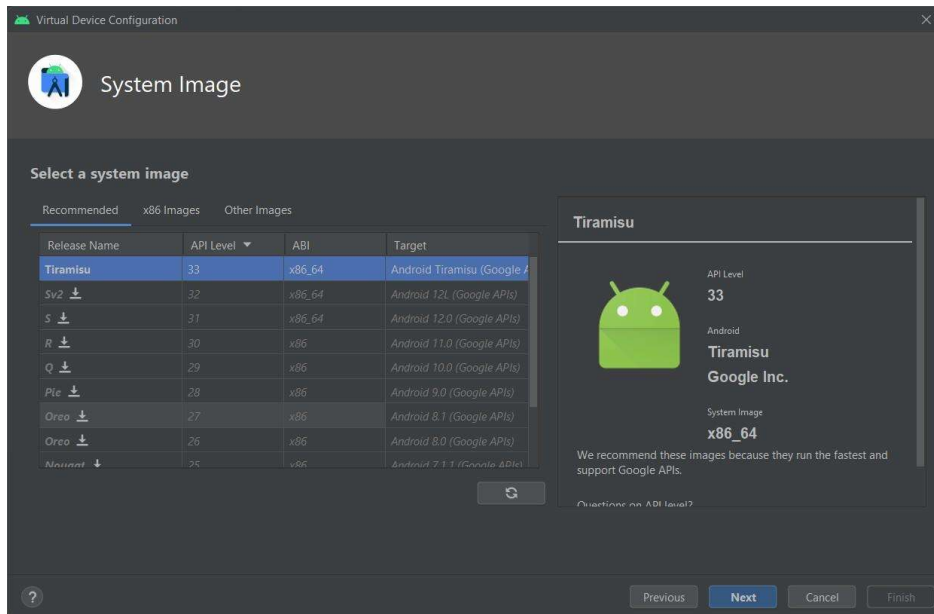


Step 8.2: Choose your device definition and click on Next.

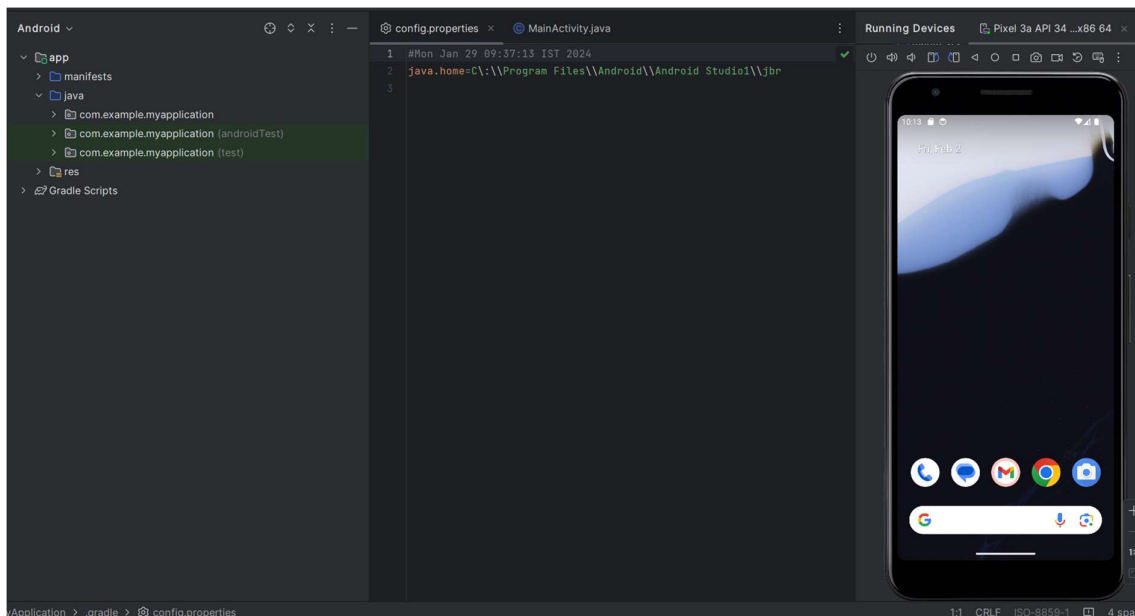


Step 8.3: Select the system image for the latest Android version and click on Next.

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

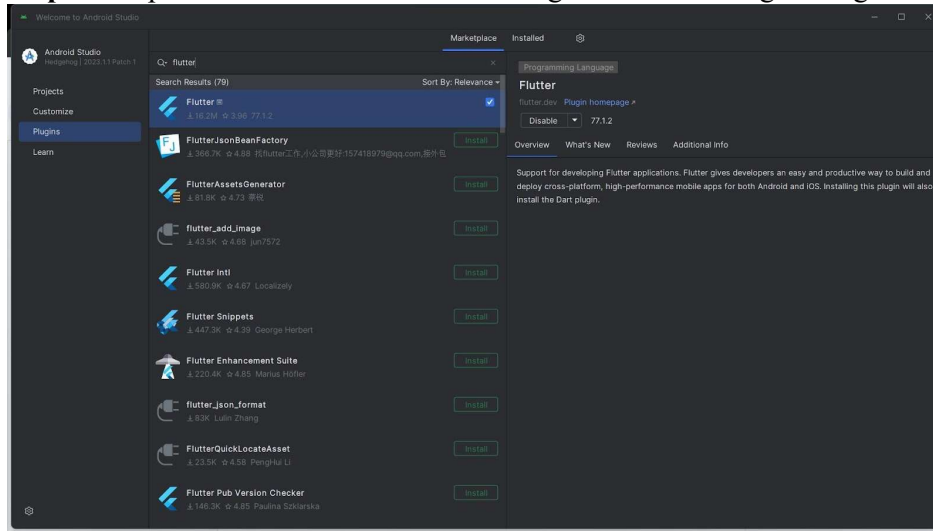


Step 8.5: Last, click on the icon pointed into the red color rectangle. The Android emulator displayed as below screen.



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 Dart plugin as below screen. Click yes to proceed.

Step 9.3: Restart the Android Studio.

Conclusion:

In this experiment we understood basic installation steps. Also we understood how to access flutter sdk and Android studio we installed. As well as how to make use of flutter to develop various mobile applications. We also got to know how to choose devices from device manager for better experience.