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MPL Practical 01

Aim: Installation and Configuration of Flutter Environment.

Theory:

Flutter is an open-source UI toolkit by Google for building cross-platform applications. To start working with Flutter, we need to install the Flutter SDK and set up necessary tools.

Installation Steps:

Step 1: Download and Extract Flutter SDK

- Visit <https://docs.flutter.dev/get-started/install> and download Flutter SDK for Windows.
- Extract the ZIP file and place it in C:/Flutter.

Step 2: Set Up System Path

- Open System Properties → Environment Variables.
- Edit Path under System Variables.
- Add C:/Flutter/bin and save changes.

Step 3: Verify Installation

- Open Command Prompt and run: flutter doctor
- This checks if all components are installed.

Installing Android SDK and Android Studio

Step 4: Install Android Studio

- Download and install Android Studio.
- Follow setup instructions and complete the installation.

Step 5: Accept Android Licenses

- Run the command: flutter doctor --android-licenses
- Accept all licenses by typing y.

Setting Up an Android Emulator

Step 6: Create an Emulator

- Open Android Studio → AVD Manager → Create Virtual Device.
- Select a device and system image, then finish setup.
- Start the emulator.

Installing Flutter and Dart Plugins

Step 7: Install Plugins in Android Studio

- Go to File → Settings → Plugins.

- Search and install Flutter and Dart plugins.
- Restart Android Studio.

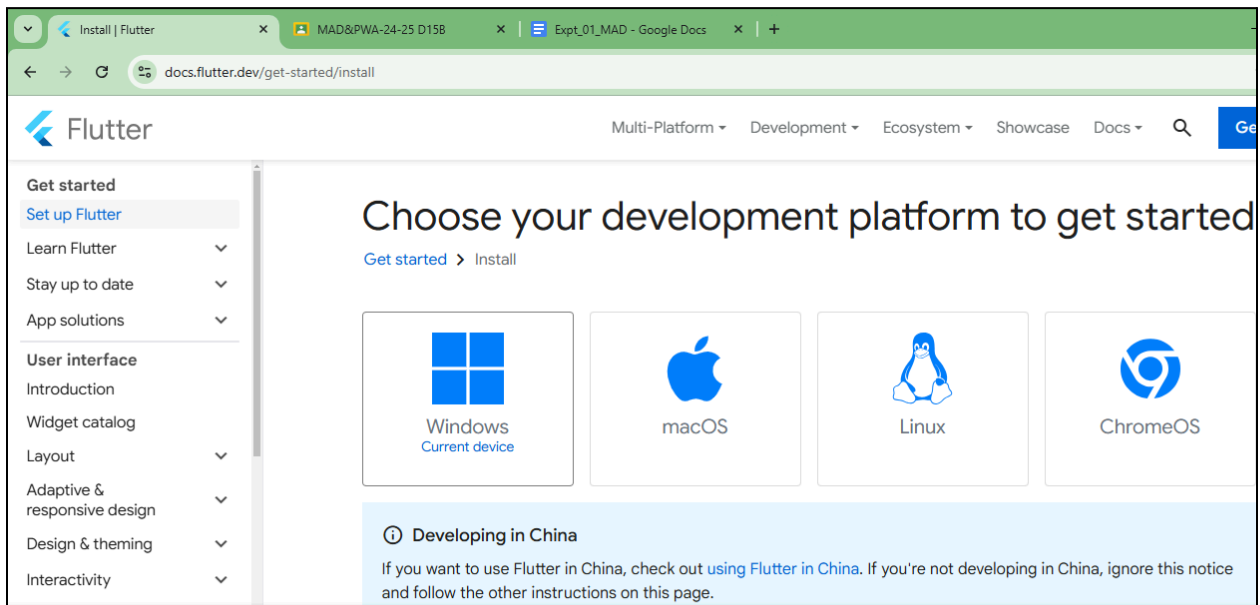
Final Verification

Step 8: Run Flutter Doctor

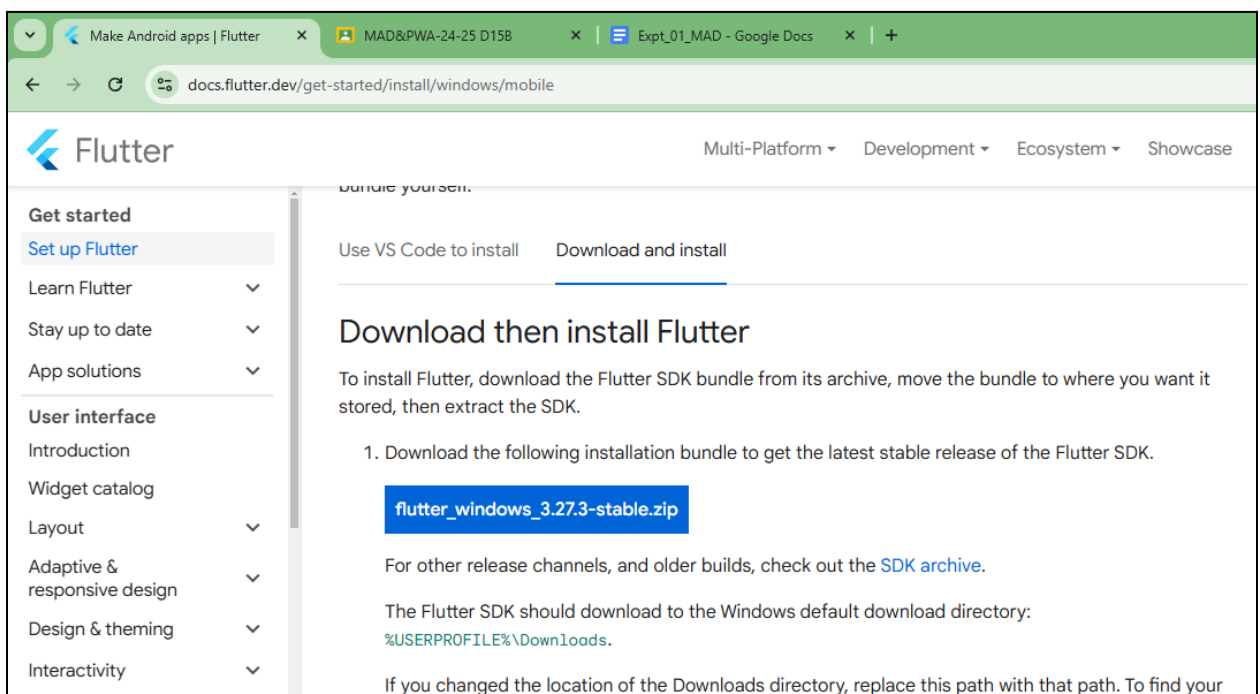
- Open Command Prompt and run: flutter doctor
- Ensure all tools are installed.

Install the Flutter SDK

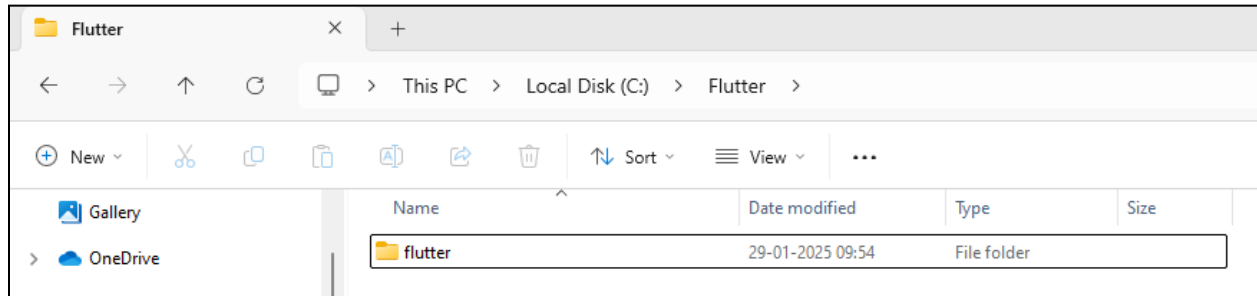
Step 1: Download the installation bundle of the Flutter Software Development Kit for windows. To download Flutter SDK, Go to its official website <https://docs.flutter.dev/get-started/install>, you will get the following screen.



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

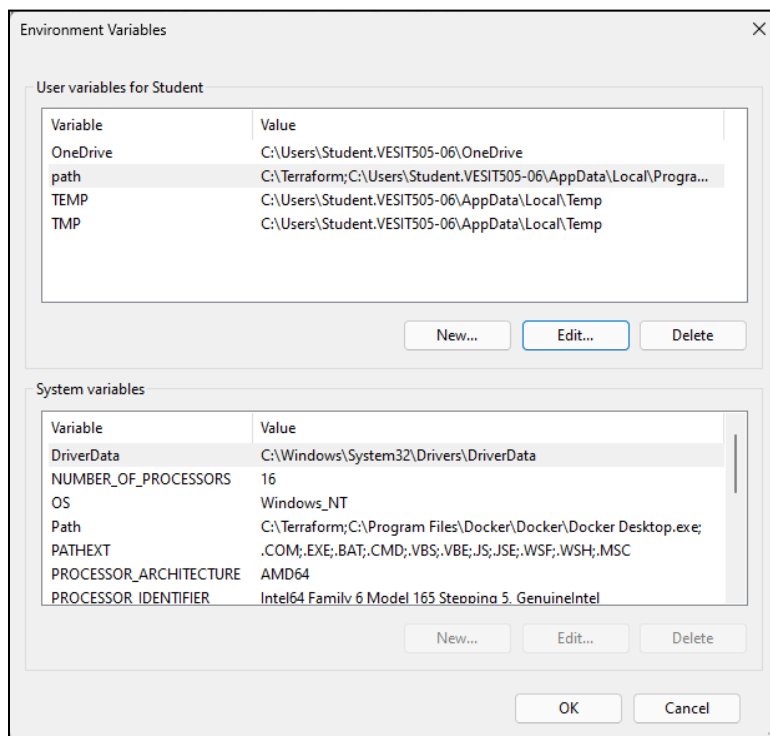


Step 3: When your download is complete, extract the zip file and place it in the desired installation folder or location, for example, C: /Flutter.



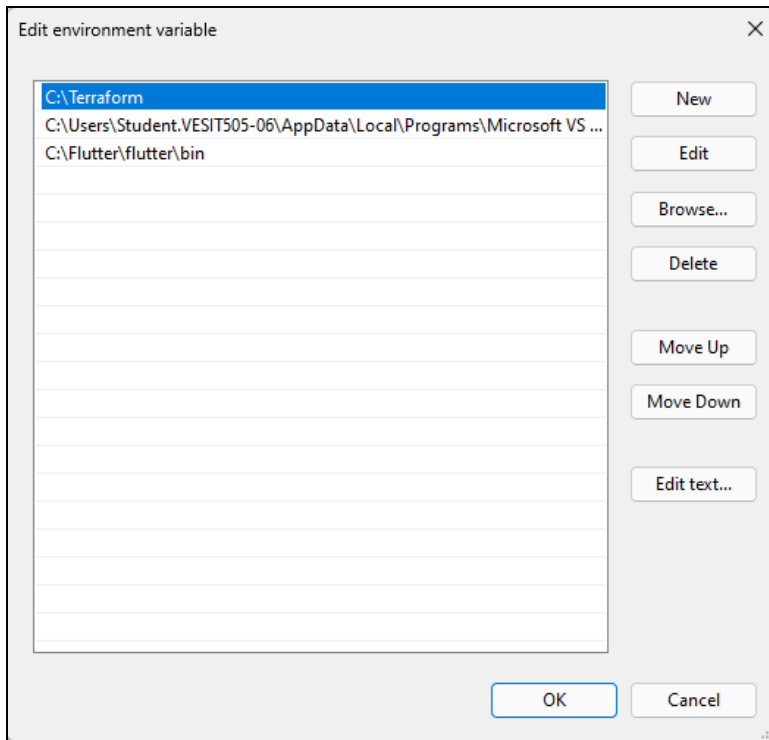
Step 4: To run the Flutter command in regular windows console, you need to update the system path to include the flutter bin directory. The following steps are required to do this:

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 the 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.

```

C:\Users\Student.VESIT505-06>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.
--enable-analytics         Enable telemetry reporting each time a flutter or dart command runs.
--disable-analytics       Disable telemetry reporting each time a flutter or dart command runs, until it is re-enabled.
--suppress-analytics       Suppress analytics reporting for the current CLI invocation.

Available commands:

Flutter SDK
bash-completion  Output command line shell completion setup scripts.
channel          List or switch Flutter channels.
config           Configure Flutter settings.
doctor           Show information about the installed tooling.
downgrade        Downgrade Flutter to the last active version for the current channel.
precache         Populate the Flutter tool's cache of binary artifacts.
upgrade          Upgrade your copy of Flutter.
  
```

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 - f x + v

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 reporting by running 'flutter --disable-analytics'

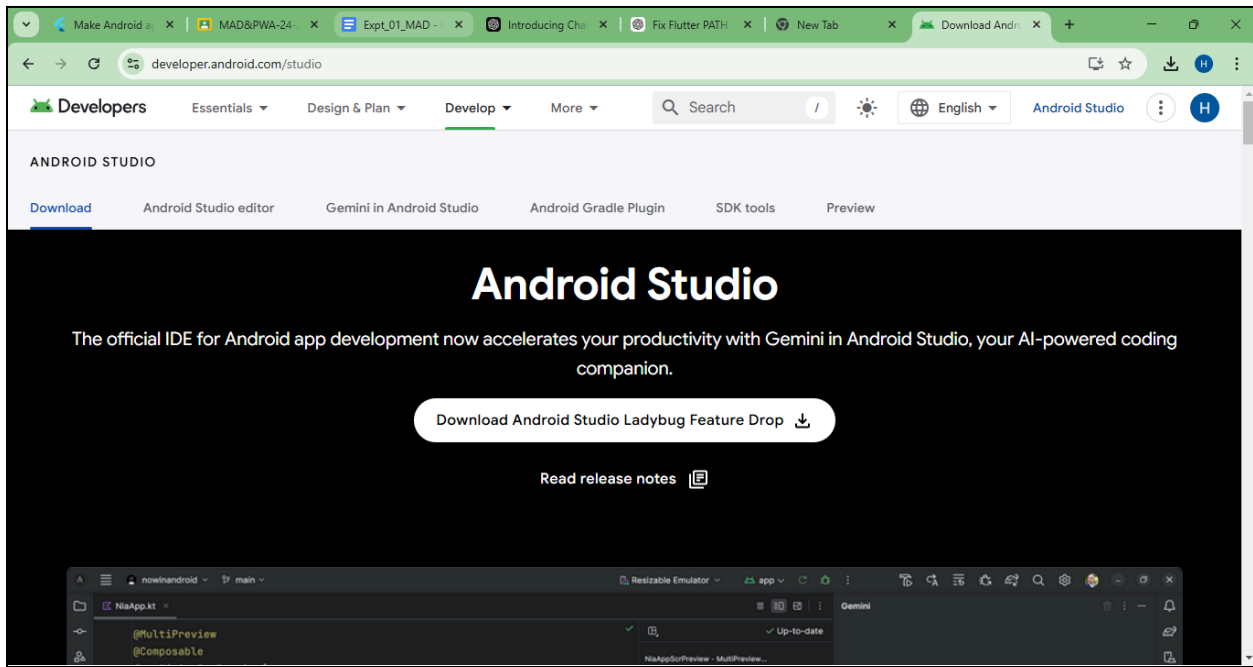
C:\Users\Student.VESIT505-06>Flutter doctor
Doctor summary (to see all details, run flutter doctor -v):
[✓] Flutter (Channel stable, 3.27.3, on Microsoft Windows [Version 10.0.22631.4751], locale en-IN)
[✗] Windows Version (the doctor check crashed)
    X Due to an error, the doctor check did not complete. If the error message below is not helpful, please let us know about this issue at
      https://github.com/flutter/flutter/issues.
    X ProcessException: Failed to find "powershell" in the search path.
      Command: powershell
[✗] Android toolchain - develop for Android devices
    X 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/to/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 Community 2022 17.4.3)
[!] Android Studio (not installed)
[✓] VS Code (version 1.96.4)
[✓] Connected device (3 available)
[✓] Network resources

! Doctor found issues in 3 categories.

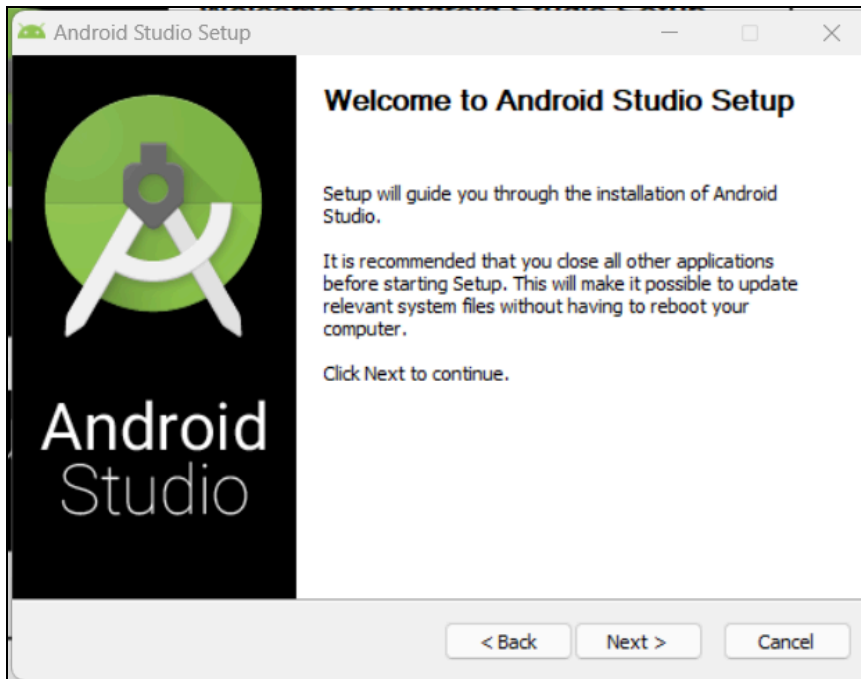
C:\Users\Student.VESIT505-06>
```

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.

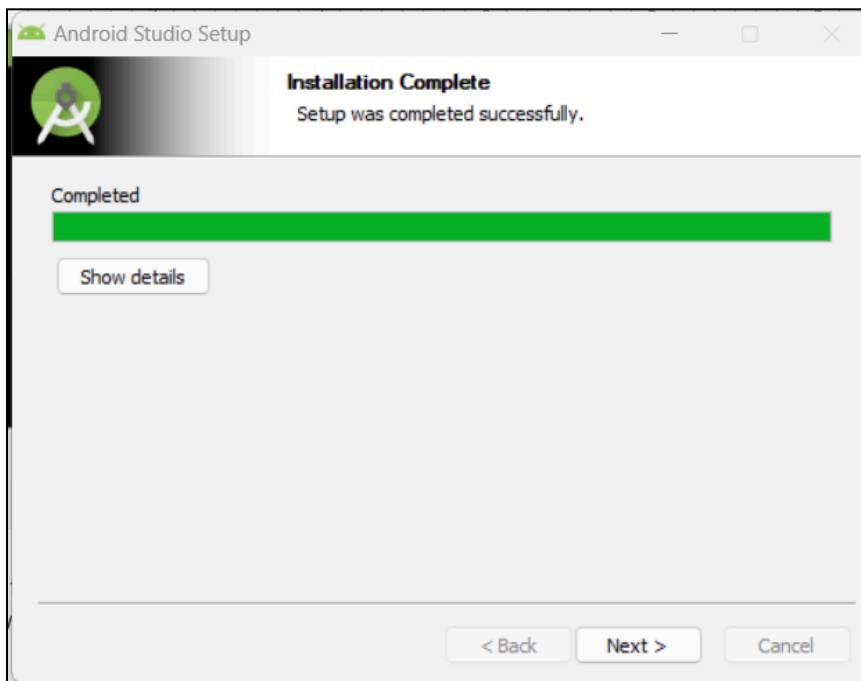
Step 7.1: Download the latest Android Studio executable or zip file from the official site.



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.

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.22631.4751]
(c) Microsoft Corporation. All rights reserved.

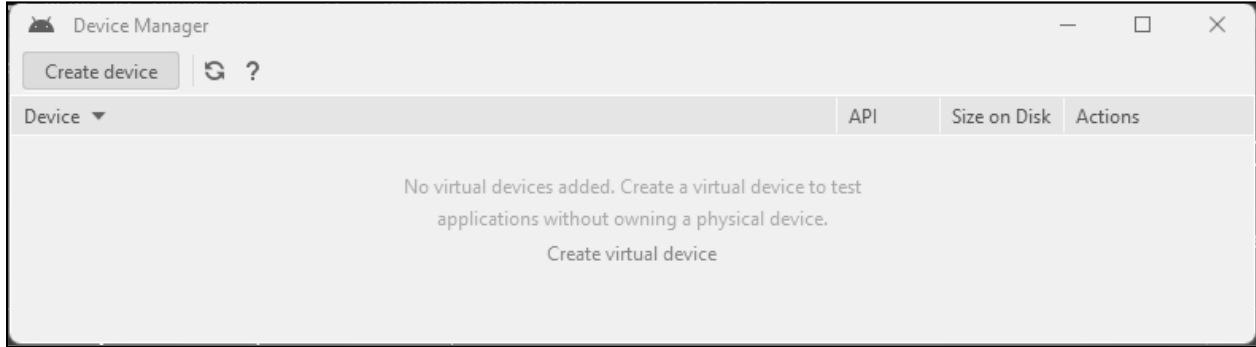
C:\Users\INFT505-19>flutter doctor
Doctor summary (to see all details, run flutter doctor -v):
[✓] Flutter (Channel stable, 3.27.3, on Microsoft Windows [Version 10.0.22631.4751], locale en-US)
[✓] Windows Version (Installed version of Windows is version 10 or higher)
[✓] Android toolchain - develop for Android devices (Android SDK version 33.0.1)
[✓] Chrome - develop for the web
[✓] Visual Studio - develop Windows apps (Visual Studio Community 2022 17.4.3)
[✓] Android Studio (version 2022.1)
[✓] VS Code (version 1.76.2)
[✓] Connected device (4 available)
[✓] Network resources

• No issues found!

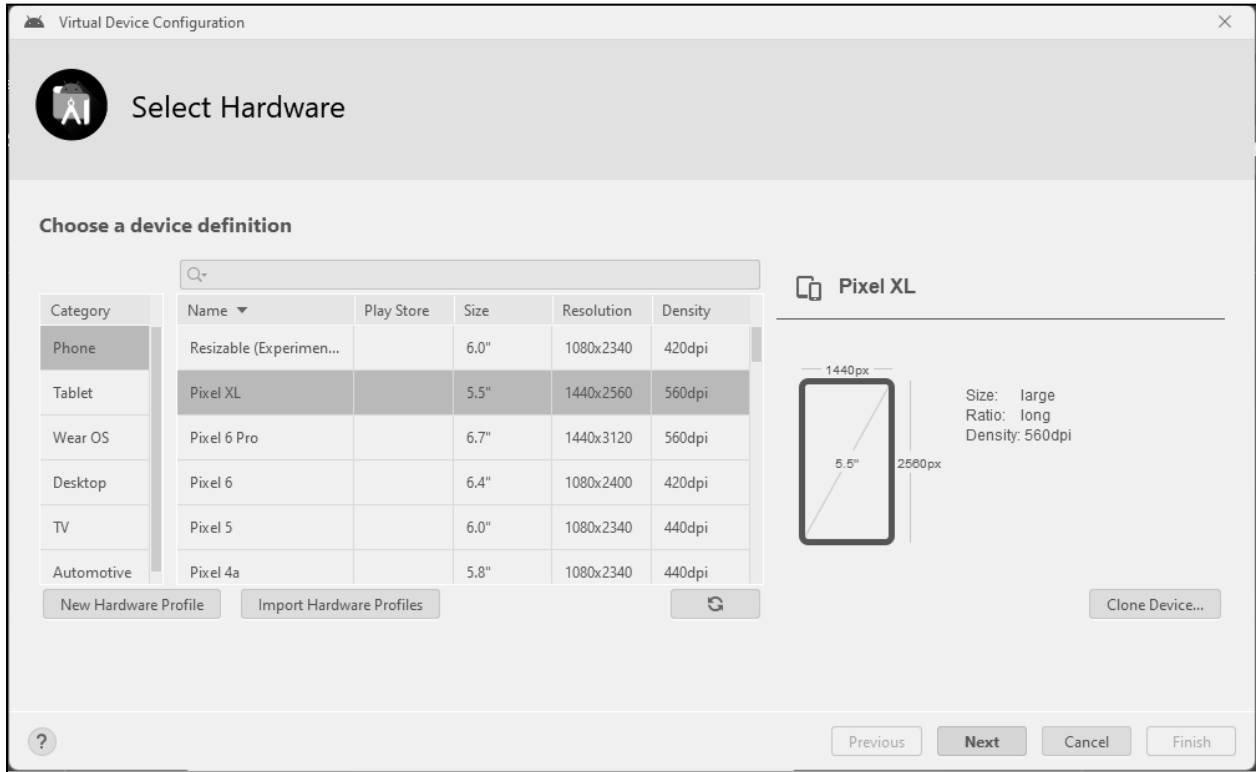
C:\Users\INFT505-19>
```

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.

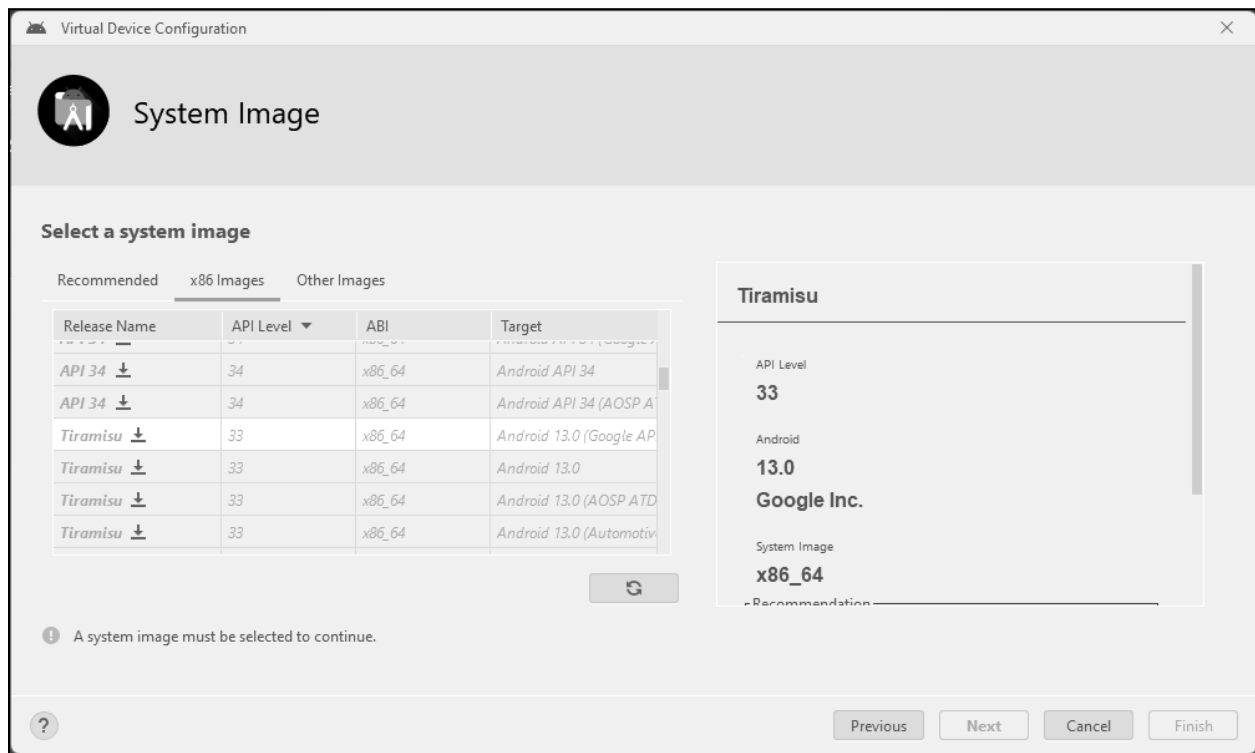


Step 8.2: Choose your device definition and click on Next.

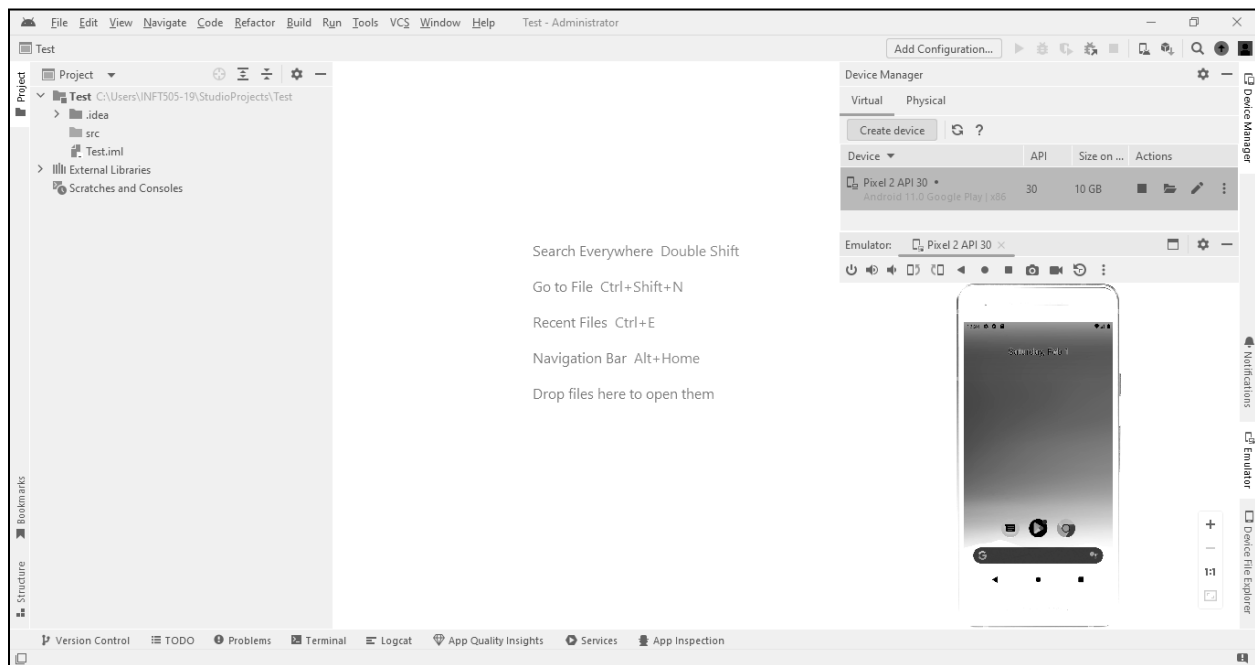


Step 8.3: Select the system image for the latest Android version and click on Next.

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

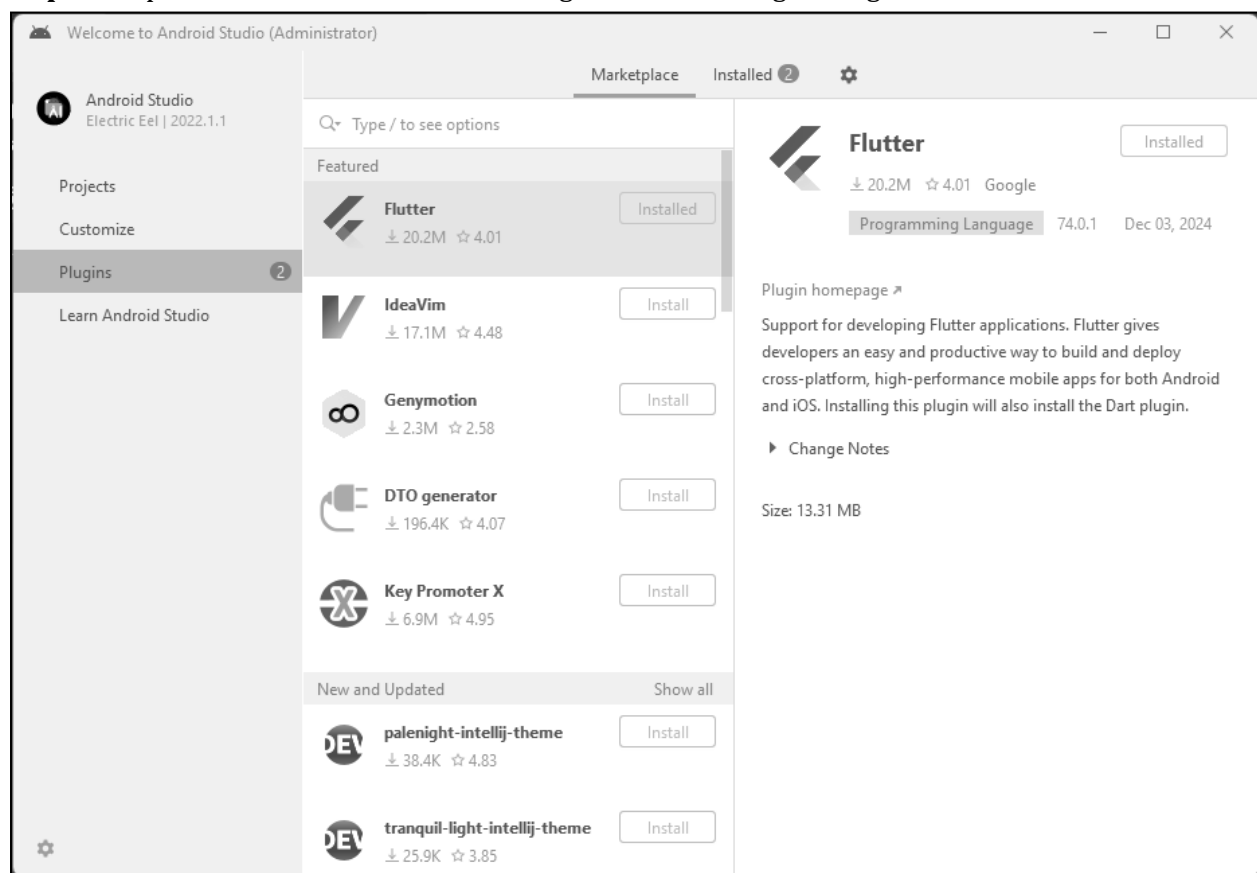


Step 8.5: Last, click on the icon pointed into the red color rectangle. The Android emulator displayed as below screen.

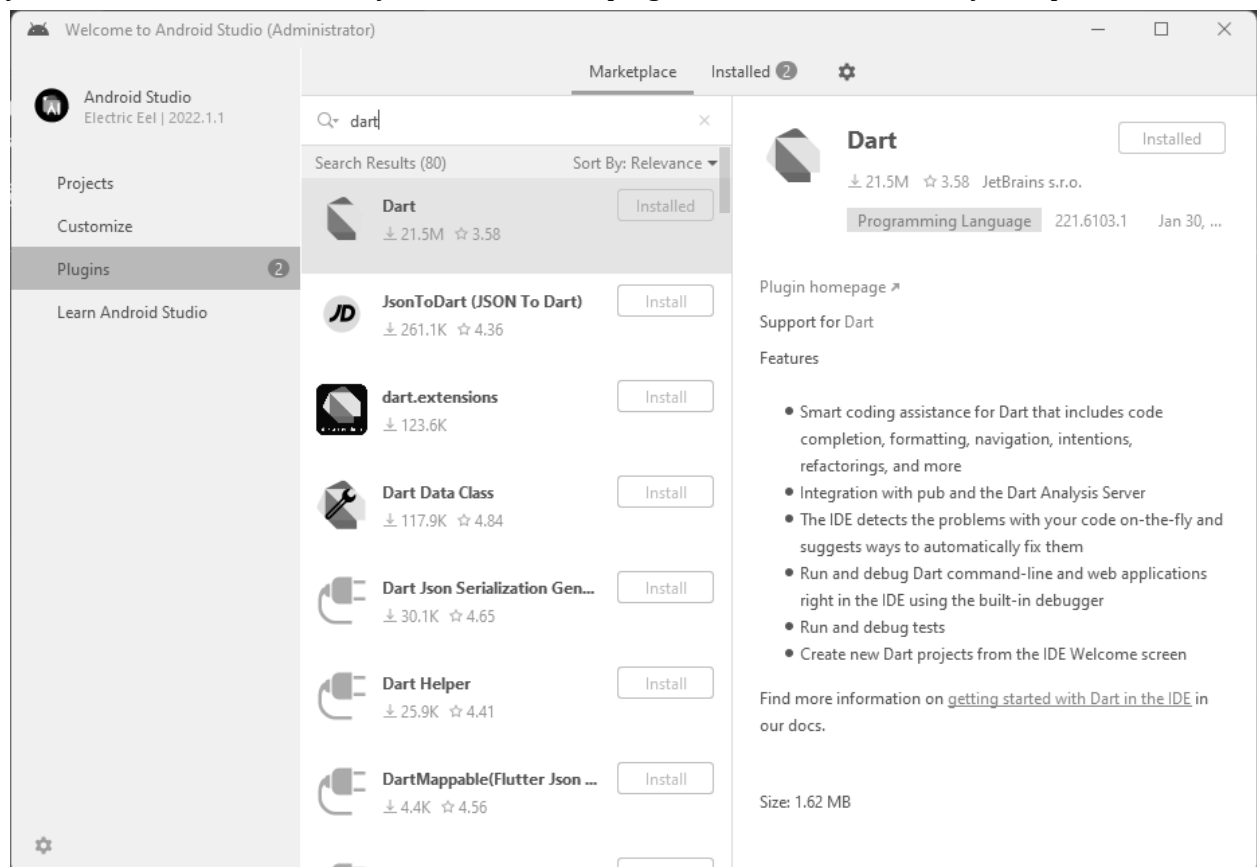


Step 9: Now, install the Flutter and Dart plugin for building Flutter applications in Android Studio. These plugins provide a template to create a Flutter application, give an option to run and debug Flutter application in the Android Studio itself. Do the following steps to install these plugins.

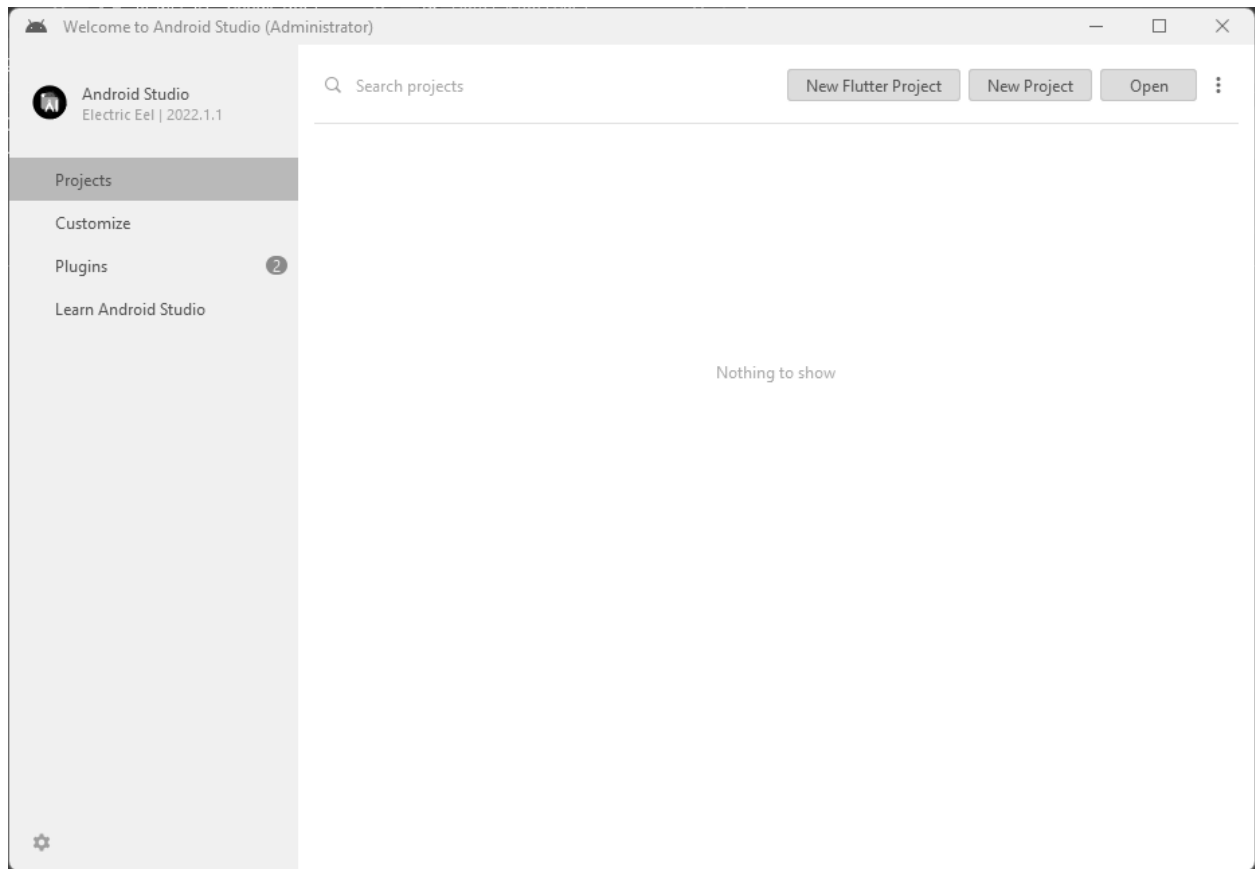
Step 9.1: Open the Android Studio and then go to File->Settings->Plugins.



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:

This experiment was both interesting and frustrating at times. While installing Flutter was straightforward, setting up the Android Emulator gave me unexpected issues. The emulator kept crashing due to insufficient system memory. I had to tweak the AVD settings and allocate more RAM to fix it. This taught me that system requirements play a huge role in development.