

EXP 1: Installation and Configuration of Flutter Environment.

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

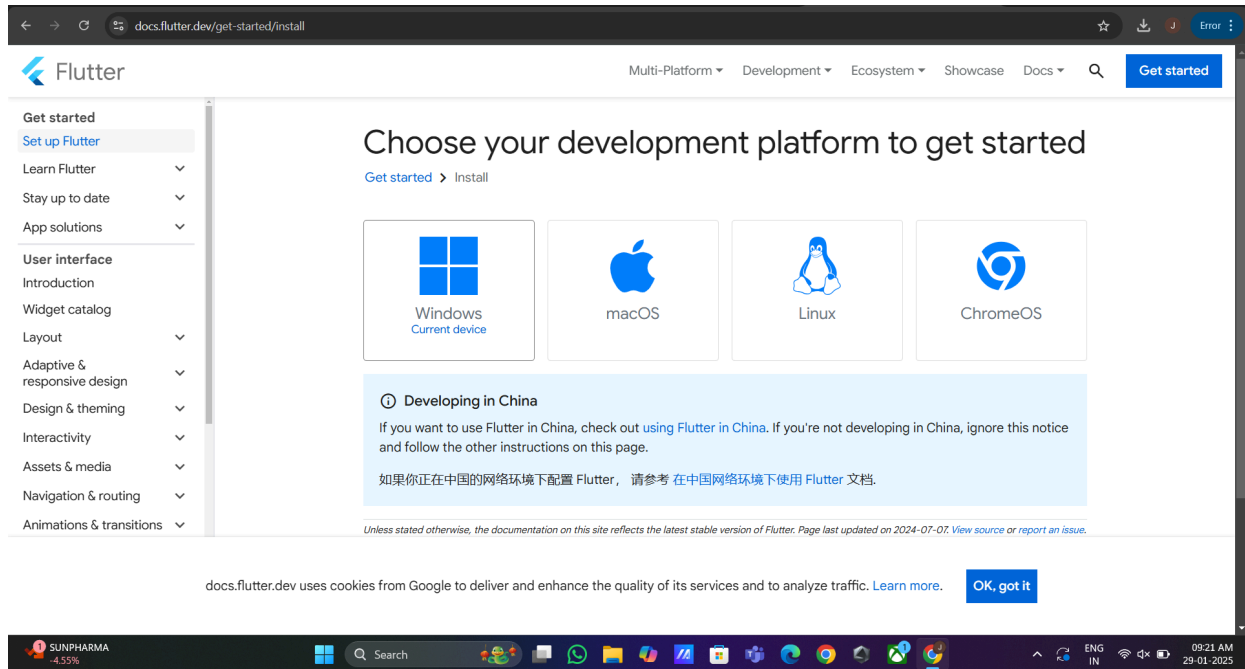
Theory: Flutter is an open-source framework developed by Google to create cross-platform applications from a single codebase. It enables the development of high-performance apps for Android, iOS, Web, and Desktop. Flutter uses Dart, a programming language developed by Google, which offers fast compilation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

Key Components for Setting Up the Flutter Environment:

1. Flutter SDK:
 - a. 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.
 - b. It also includes Flutter CLI tools like flutter doctor, flutter run, and flutter build for managing projects and debugging.
2. Dart SDK
 - a. Dart is the programming language used by Flutter. It is object-oriented and supports asynchronous programming.
 - b. 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)
 - a. Android Studio: A full-featured IDE that includes Flutter and Dart plugins, device emulators, and tools for debugging and profiling.
 - b. Visual Studio Code (VS Code): A lightweight editor with excellent Flutter and Dart plugin support for development and debugging
4. Platform-Specific Tools:
 - a. Android Studio: Required for Android development with Flutter, including the Android SDK and emulator.
 - b. Xcode: Needed for iOS development on macOS, with tools like the iOS Simulator

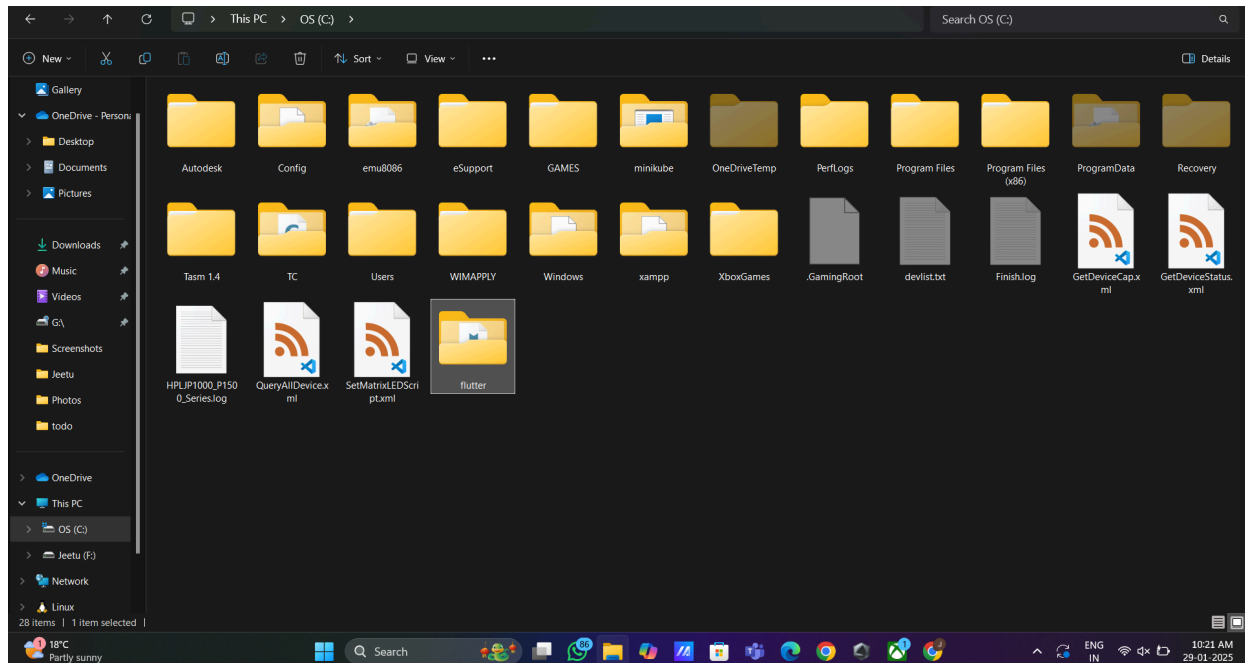
Install the Flutter SDK

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.



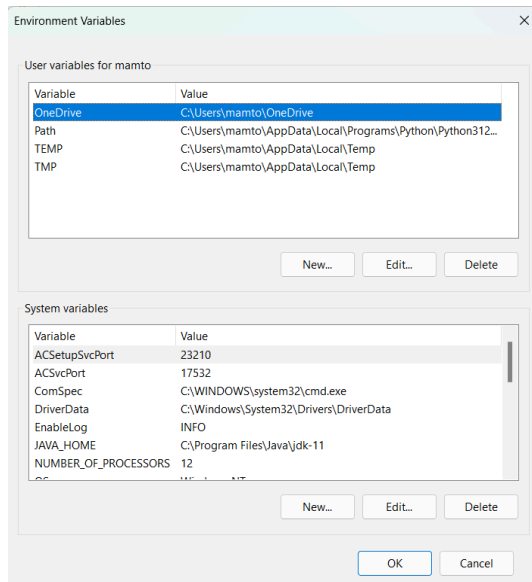
Step 2: Next, to download the latest Flutter SDK, click on the Windows icon. Here, you will find the download link for SDK.

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.

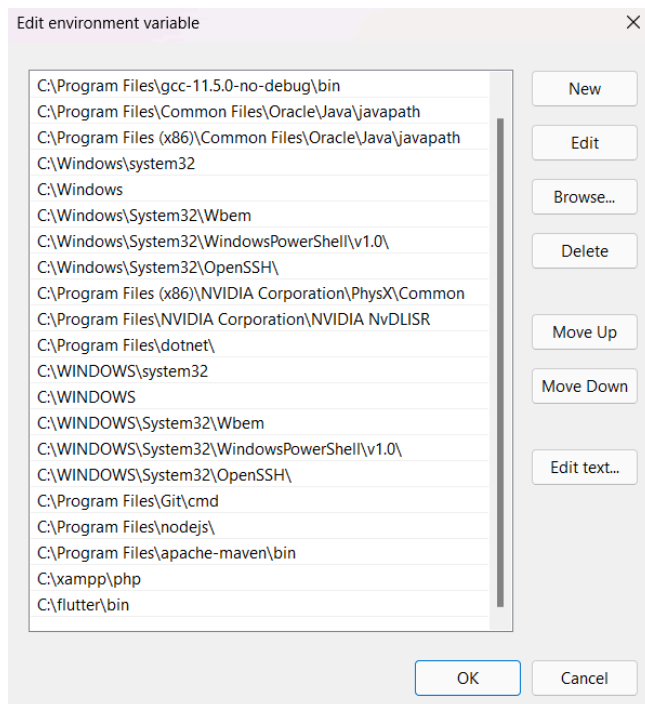


Step 4: To run the Flutter command in regular windows console, you need to update the system path to include the flutter bin directory. The following steps are required to do this:

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.

```
Microsoft Windows [Version 10.0.22631.4751]
(c) Microsoft Corporation. All rights reserved.

C:\Users\mamto>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
```

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:\Users\mamto>flutter doctor
```

Welcome to Flutter! - <https://flutter.dev>

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/to/crash-reporting>

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

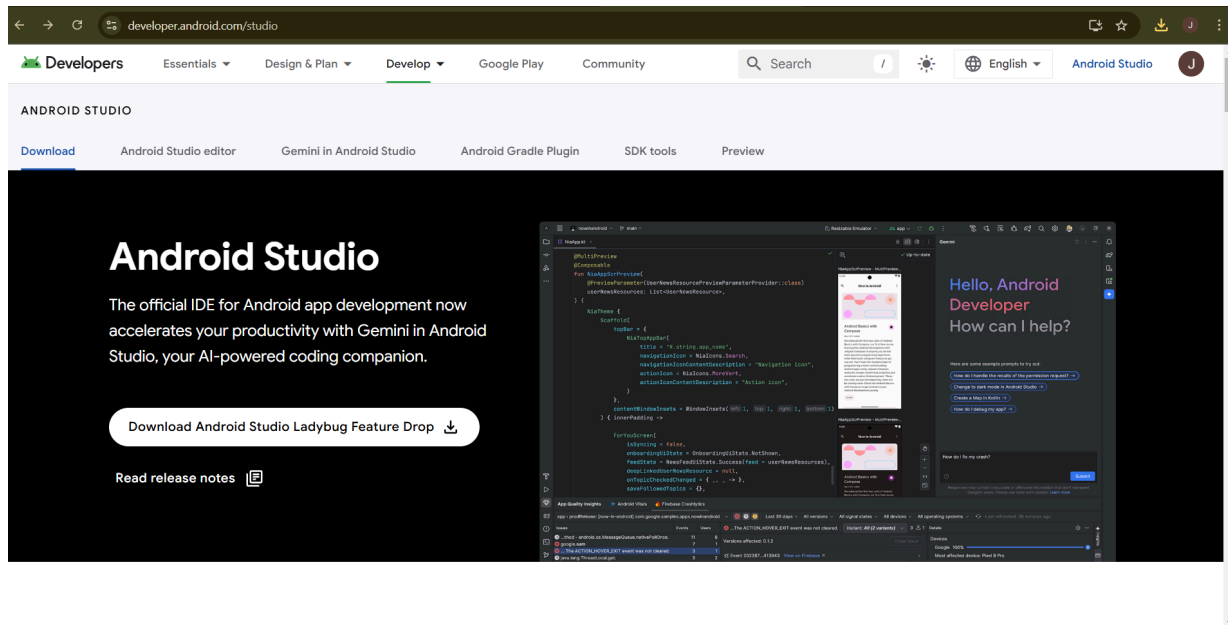
To disable animations in this tool, use
'flutter config --no-cli-animations'.

Doctor summary (to see all details, run flutter doctor -v):

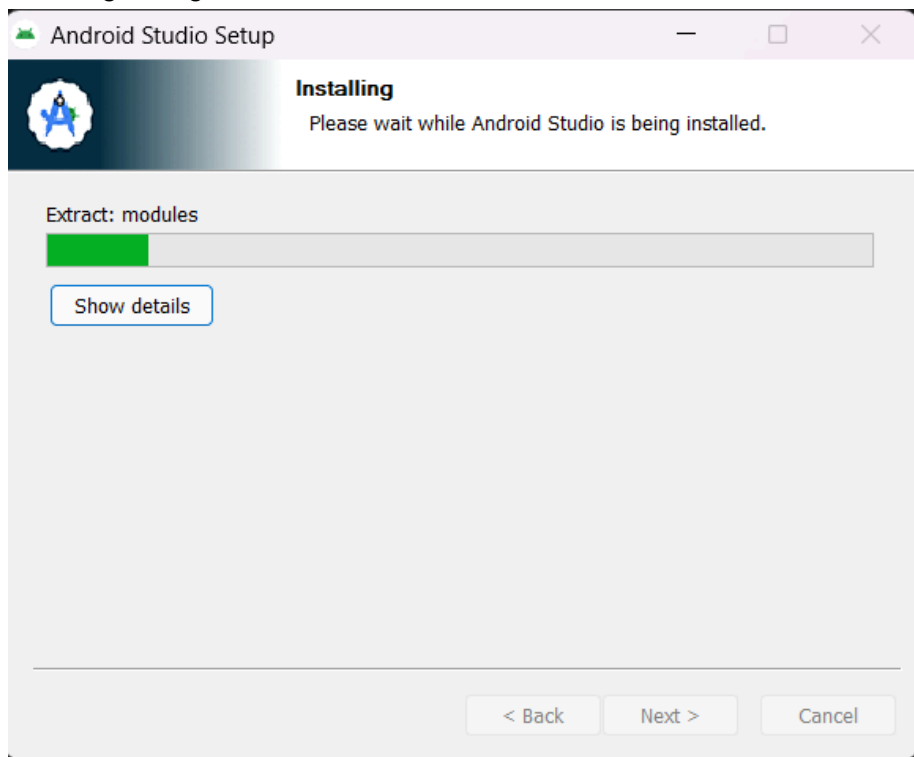
```
[✓] Flutter (Channel stable, 3.27.3, on Microsoft Windows [Version 10.0.22631.4751], locale en-IN)
[✓] Windows Version (Installed version of Windows is version 10 or higher)
[X] Android toolchain - develop for Android devices
    X Unable to locate Android SDK.
      Install Android Studio from: https://developer.android.com/studio/index.html
      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
[X] Visual Studio - develop Windows apps
    X 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 (not installed)
```

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.

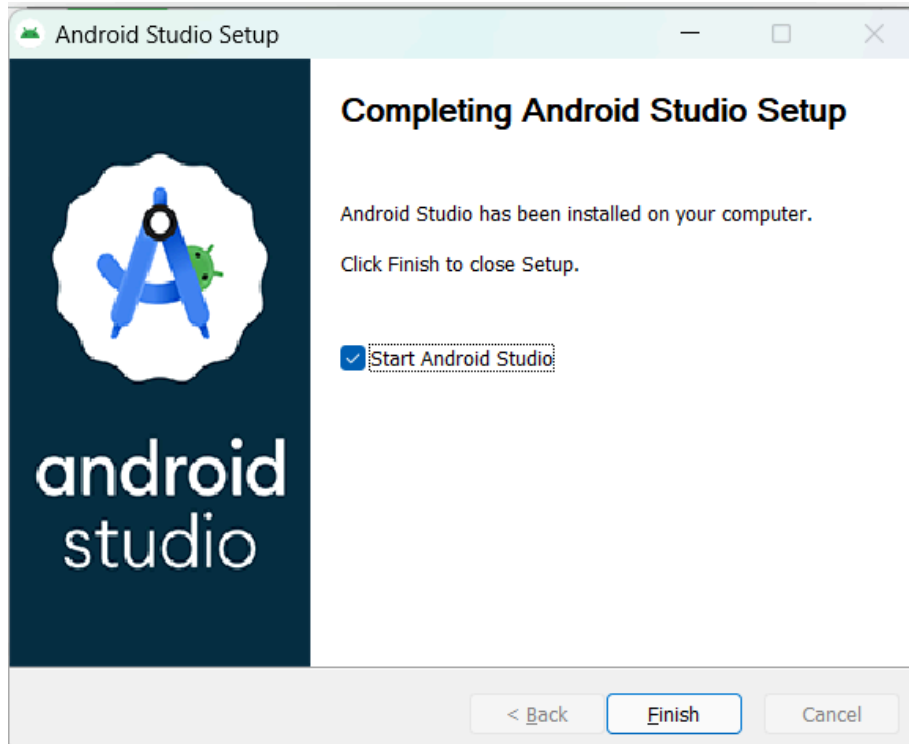
Step 7.1: Download the latest Android Studio executable or zip file from the official site.



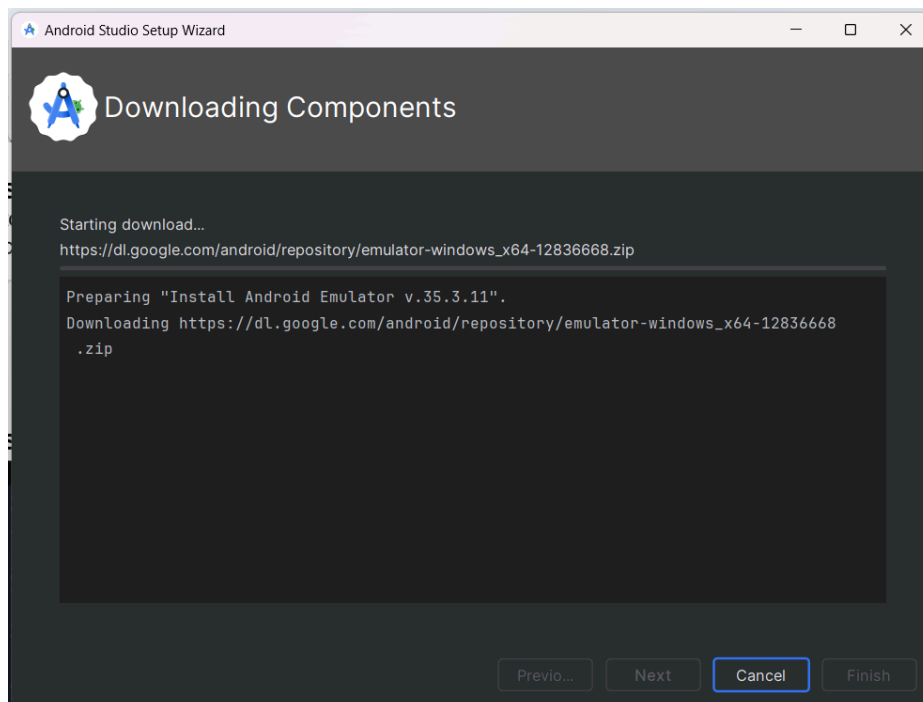
Step 7.2: When the download is complete, open the .exe file and run it. You will get the following dialog box.



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.

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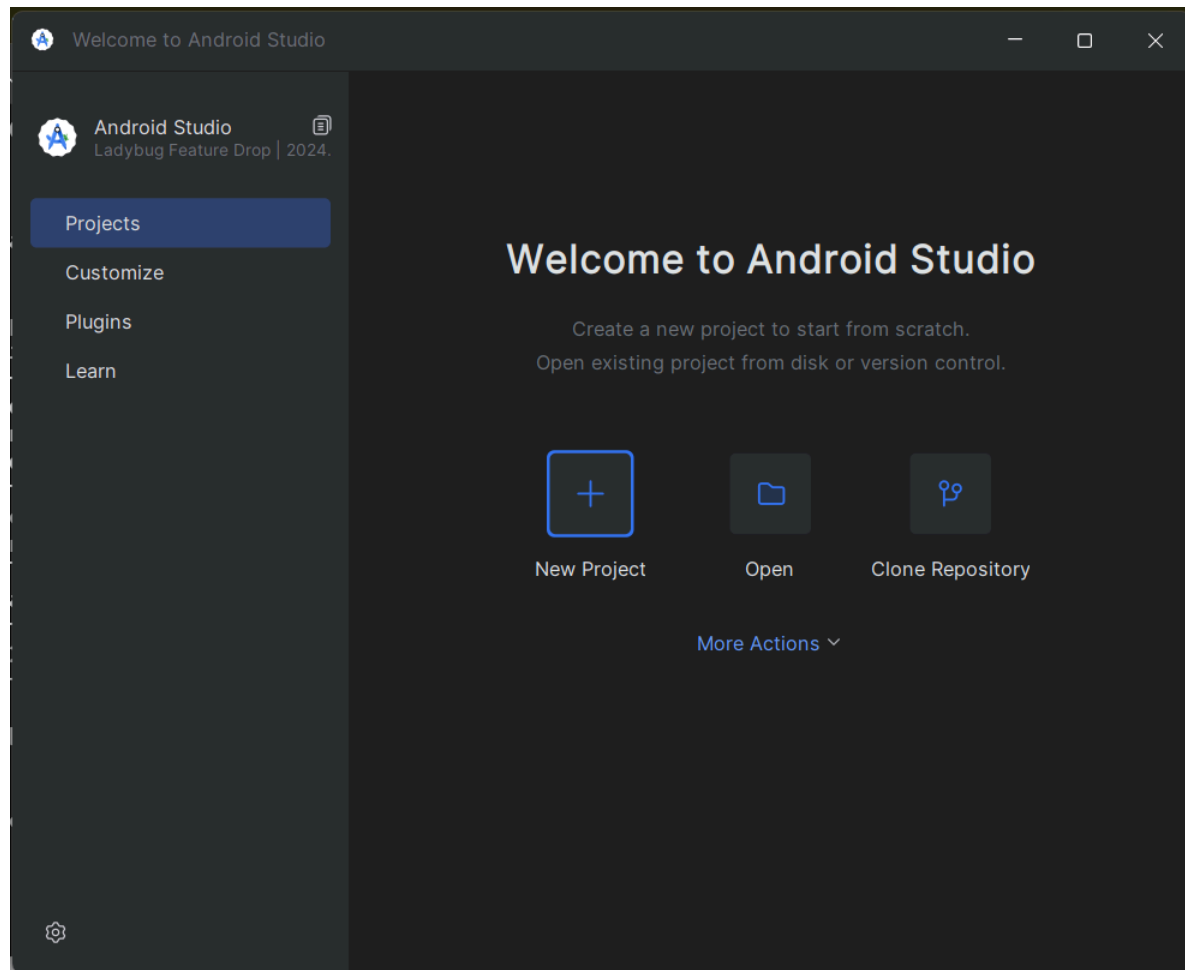
C:\Users\mamto>flutter doctor
Doctor summary (to see all details, run flutter doctor -v):
[✓] Flutter (Channel stable, 3.27.3, on Microsoft Windows [Version 10.0.22631.4751], locale en-IN)
[✓] Windows Version (Installed version of Windows is version 10 or higher)
[✓] Android toolchain - develop for Android devices (Android SDK version 35.0.1)
[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/to/windows-android-setup for more details.
[✓] Chrome - develop for the web
[✓] Visual Studio - develop Windows apps
[X] 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 2024.2)
[✓] IntelliJ IDEA Ultimate Edition (version 2024.1)
[✓] VS Code (version 1.96.4)
[✓] Connected device (3 available)
[✓] Network resources

! Doctor found issues in 2 categories.

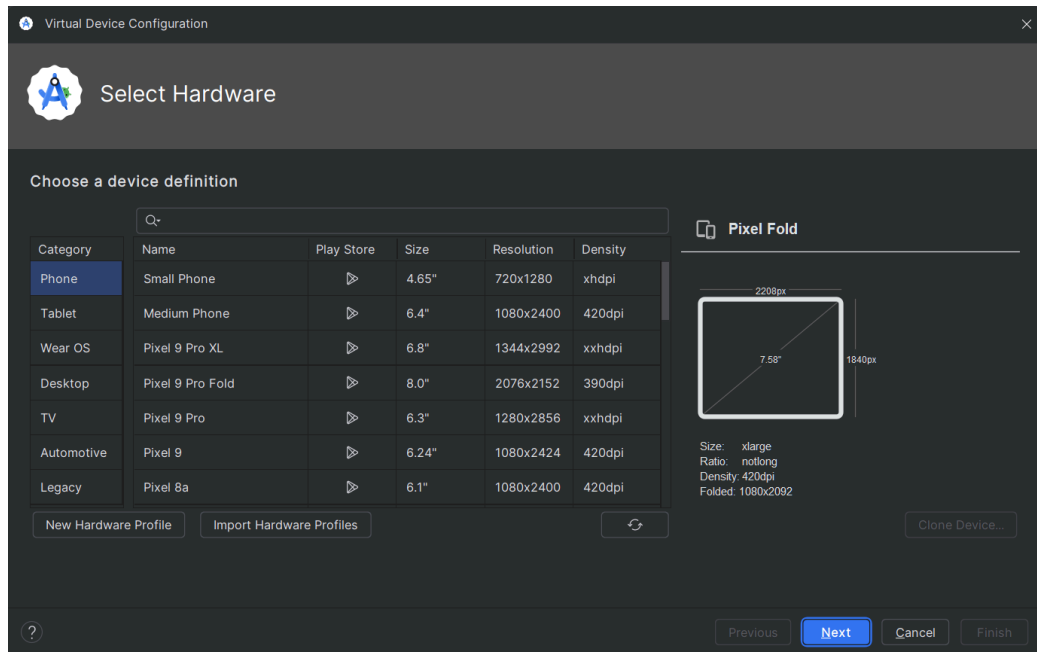
```

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.

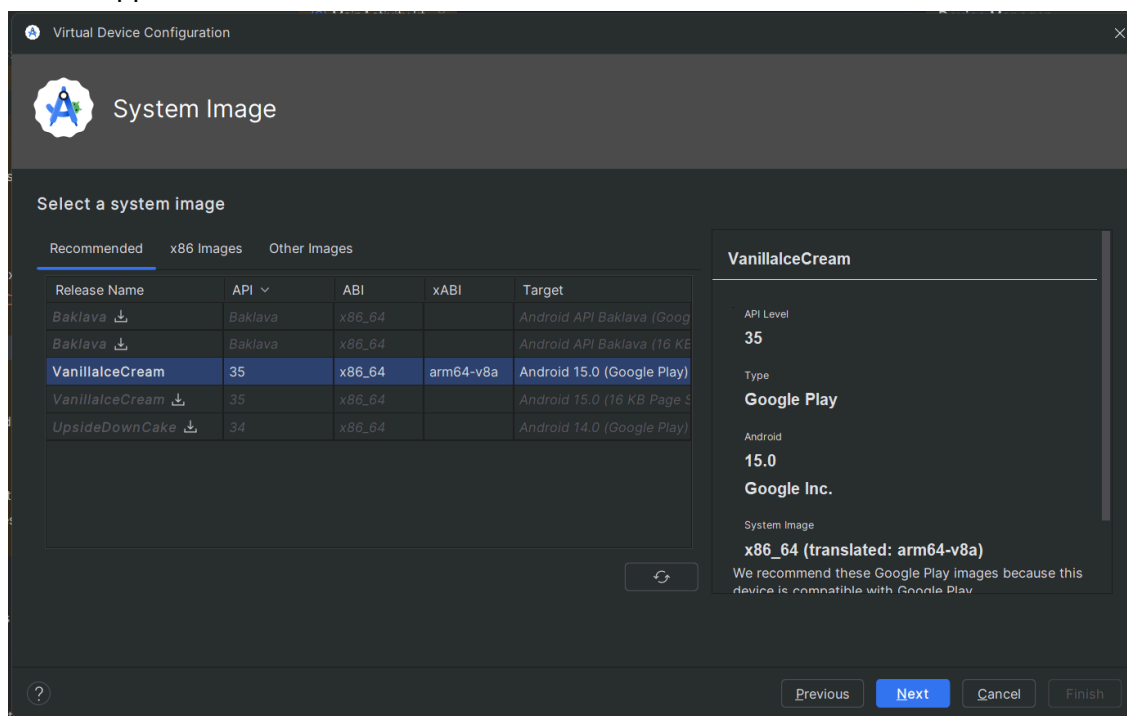


Step 8.2: Choose your device definition and click on Next.

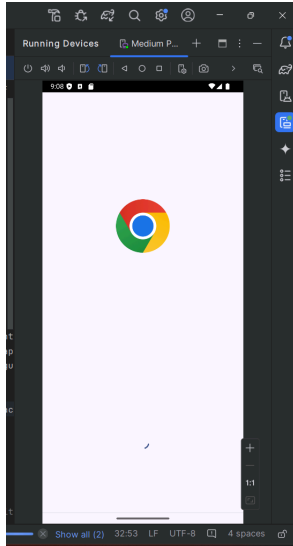


Step 8.3: Select the system image for the latest Android version and click on Next.

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

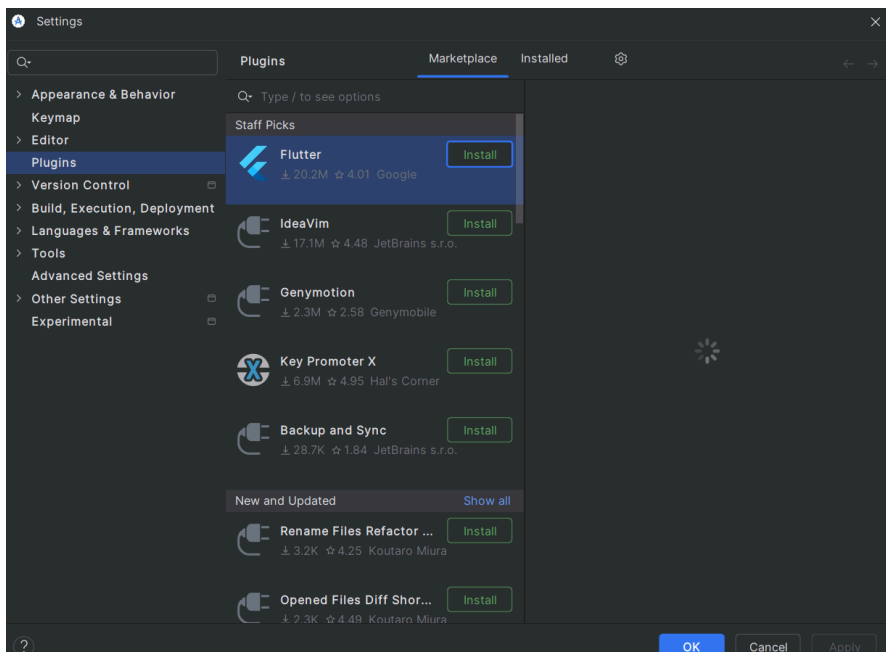


Step 8.5: Last, click on the icon pointed into the red color rectangle. The Android emulator displayed as below screen.



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.

