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EXP 1: Installation and Configuration of Flutter Environment.

Aim: Installation and Configuration of Flutter Environment.

Theory: Flutter is an open-source framework developed by Google that is primarily used for building natively compiled applications for mobile, web, and desktop from a single codebase. It is particularly popular for creating mobile apps for iOS and Android, but it can also be used to develop apps for macOS, Windows, Linux, and the web.

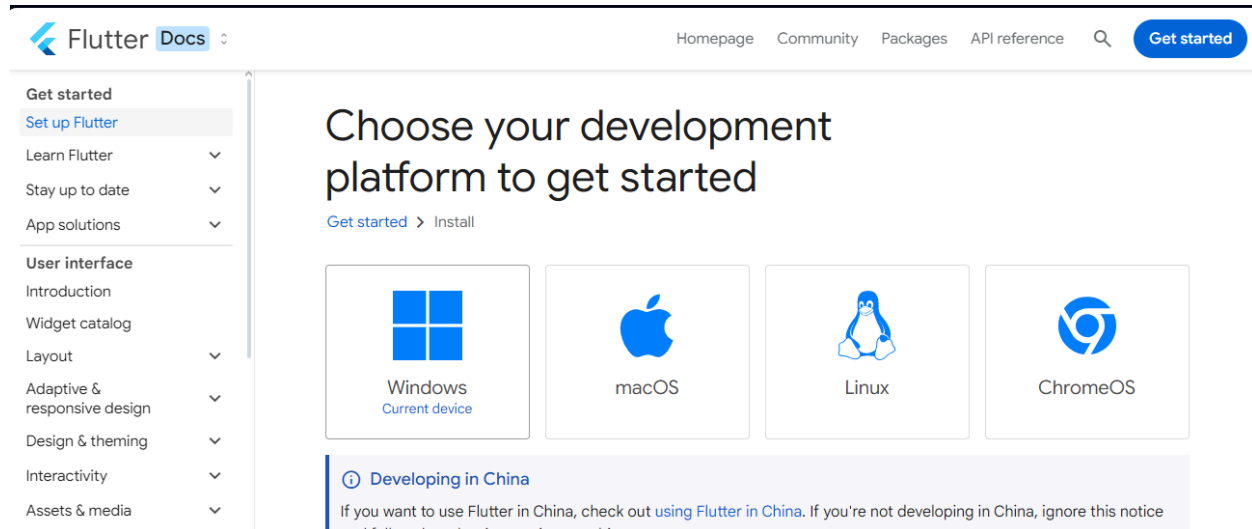
Key Features of Flutter:

1. **Cross-Platform Development:** With Flutter, developers can write one codebase and deploy it across multiple platforms (mobile, web, desktop). This greatly reduces the development effort and cost compared to maintaining separate codebases for different platforms.
2. **Hot Reload:** Flutter's "hot reload" feature allows developers to see code changes immediately reflected in the app without restarting it. This makes development faster and smoother.
3. **Widgets:** Flutter is built around a rich set of customizable widgets. These widgets describe how the app should look and behave, and they can be combined and customized to create complex UIs.
4. **Dart Programming Language:** Flutter uses Dart, a language developed by Google, which is object-oriented and compiled to native code. Dart is easy to learn and has strong support for asynchronous programming, which is crucial for building modern apps.

5. **Native Performance:** Since Flutter is compiled directly into native ARM machine code, it can provide near-native performance on both iOS and Android. This is one of the main advantages over other cross-platform frameworks like React Native.
6. **Customizable UI:** With Flutter, developers have complete control over the design and the user interface (UI). It doesn't rely on the platform's native components; instead, it provides its own set of widgets, which means you can create custom UIs that maintain consistency across platforms.

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.

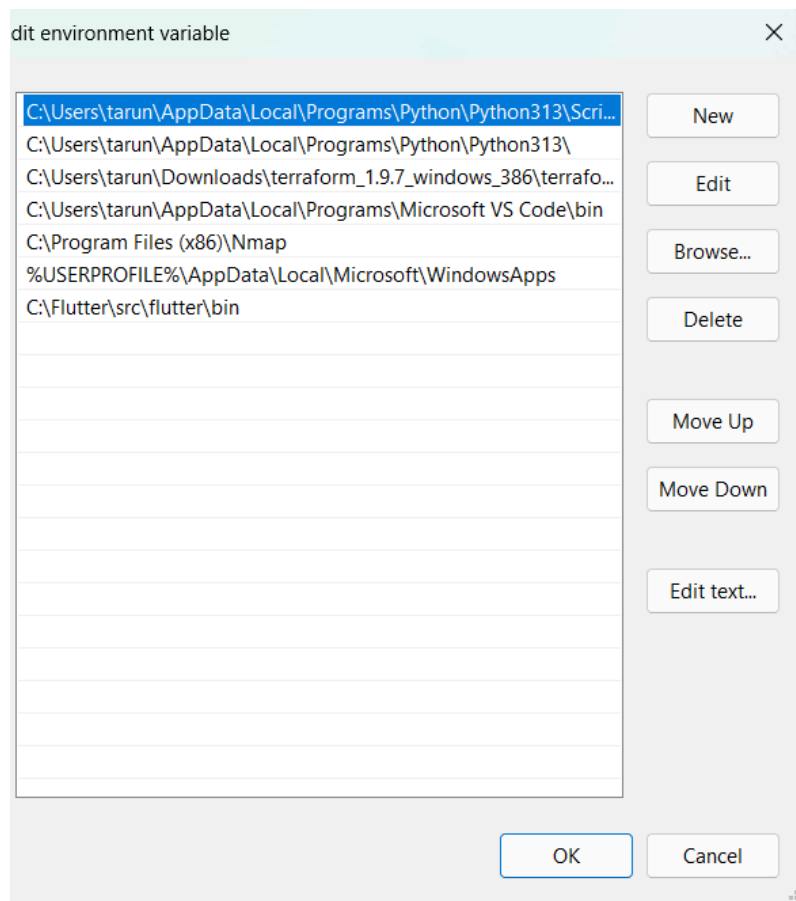


Step 2 : Download Flutter SDK: Go to the Flutter website and click on the Windows icon to download the latest SDK.

Step 3 : Extract the Zip: Once the download is complete, extract the zip file and place it in a location, like `C:\Flutter`.

Step 4 : Update System Path:

- Right-click **This PC** → **Properties** → **Advanced system settings** → **Environment Variables**.
- In the **System Variables** section, find the **Path** variable, click **Edit**, and add `C:\flutter\bin` to the list.



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 d...
Microsoft Windows [Version 10.0.26100.3037]
(c) Microsoft Corporation. All rights reserved.

C:\Users\tarun>flutter doctor
Doctor summary (to see all details, run flutter doctor -v):
[✓] Flutter (Channel stable, 3.27.4, on Microsoft Windows [Version 10.0.26100.3037], 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 (version 2024.2)
[✓] VS Code (version 1.97.0)
[✓] Connected device (3 available)
[✓] Network resources

! Doctor found issues in 2 categories.

C:\Users\tarun>flutter
Manage your Flutter app development.
```

Step 6: Now, run the \$ flutter command in command

```
Command Prompt - flutter d...
C:\Users\tarun>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.

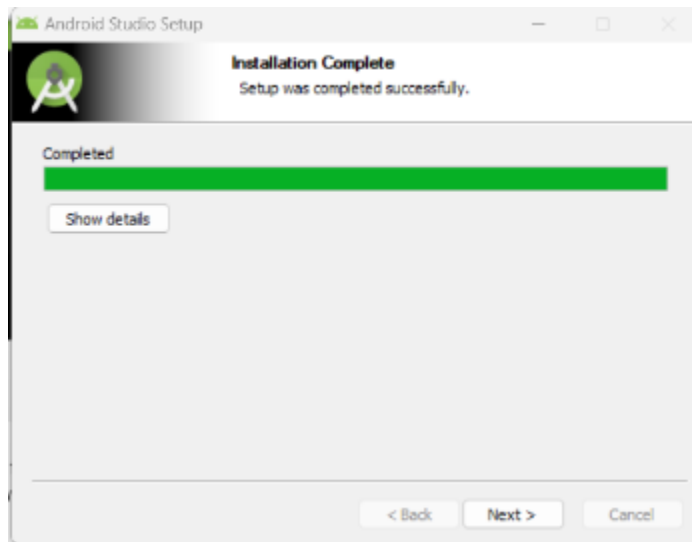
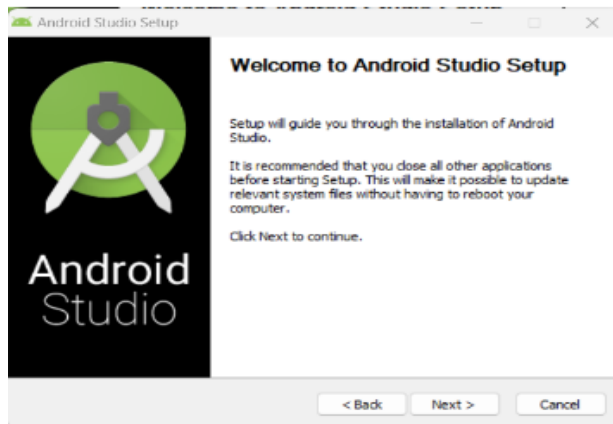
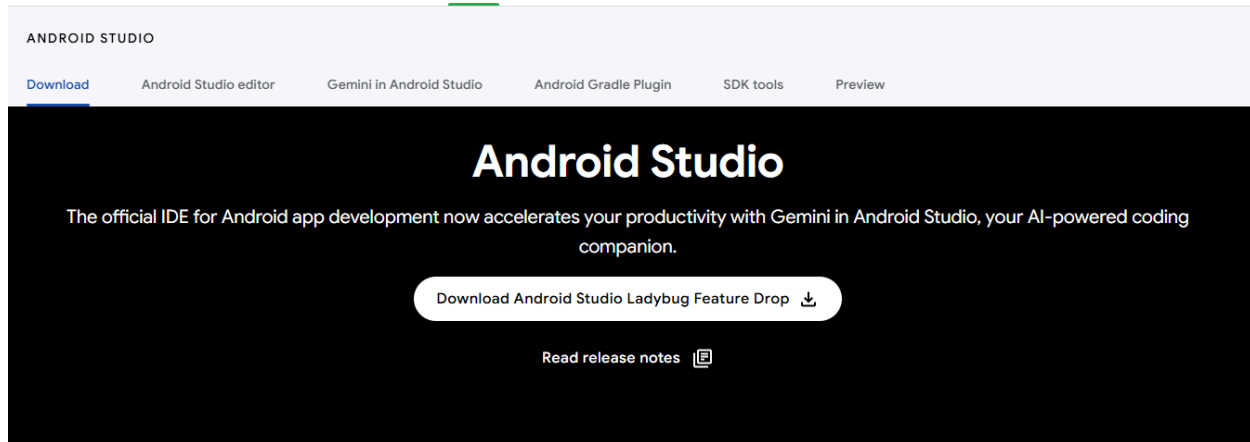
Usage: flutter <command> [arguments]

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:

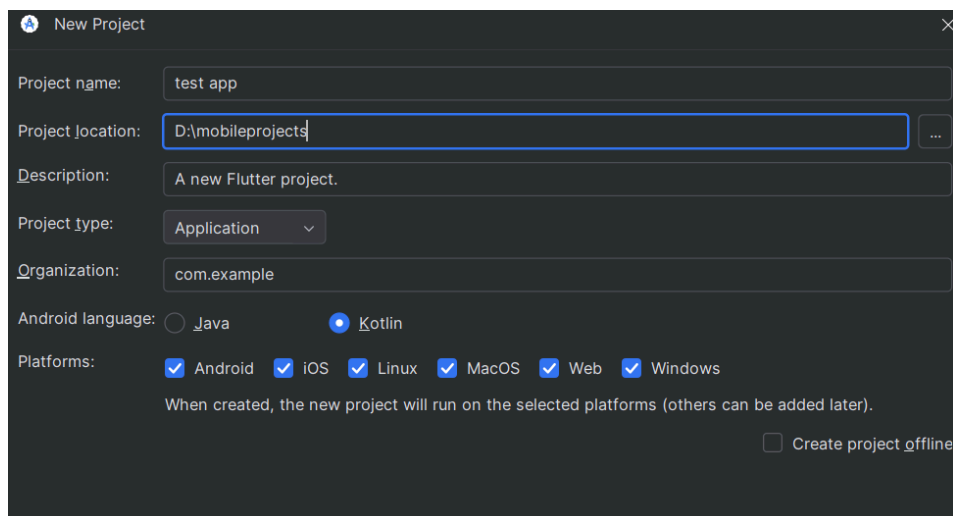
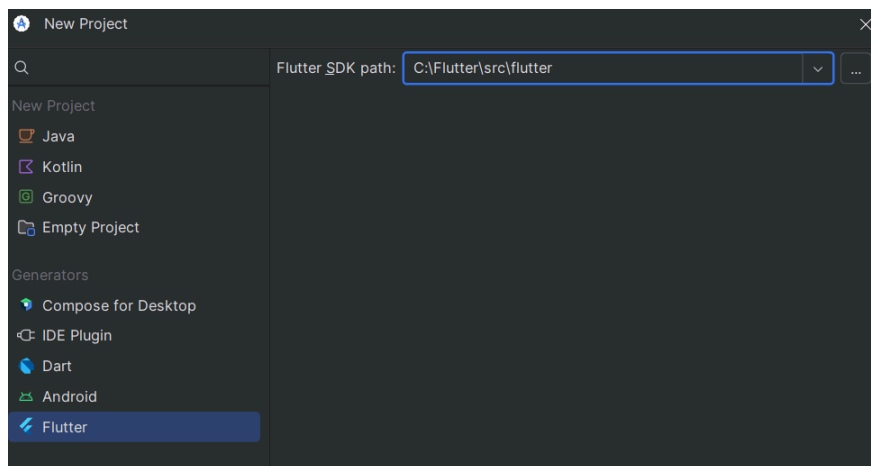
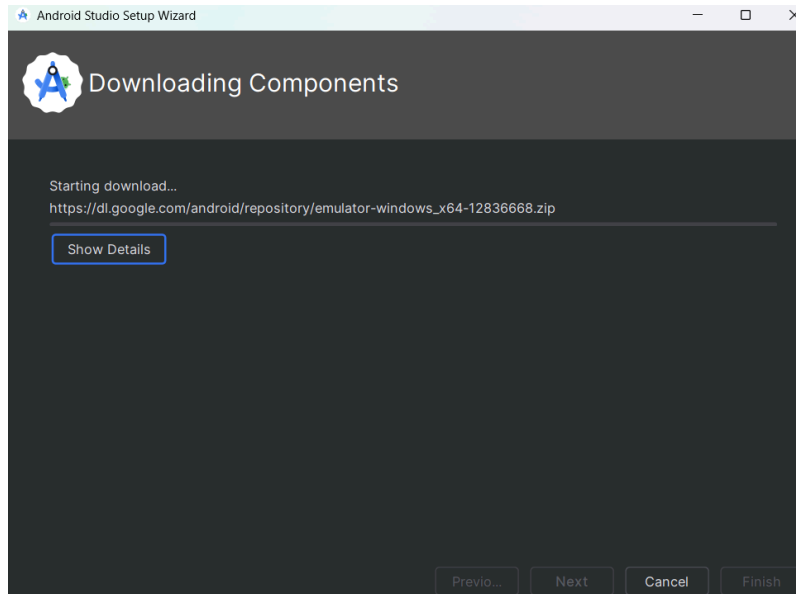
Flutter SDK
  bash-completion  Output command line shell completion setup scripts.
```

Step 7: Download and install android studio from the website

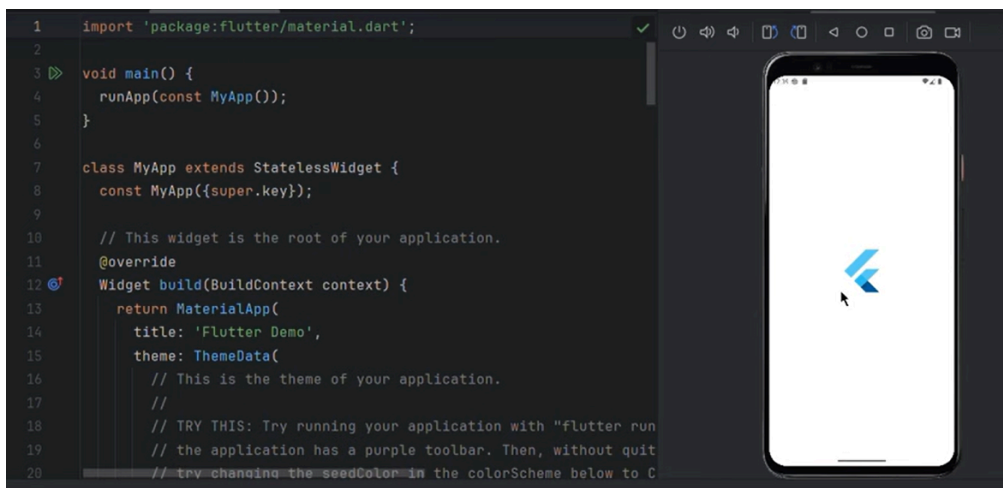
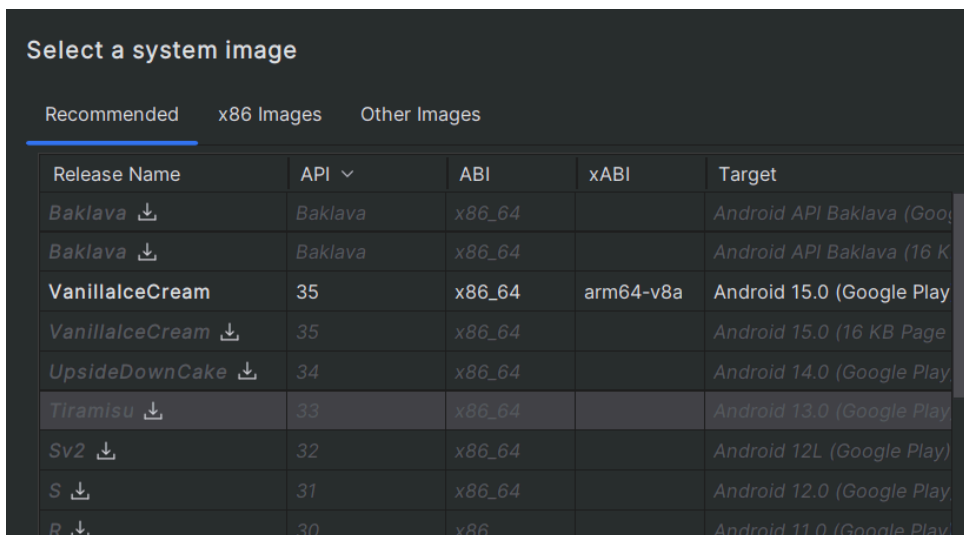
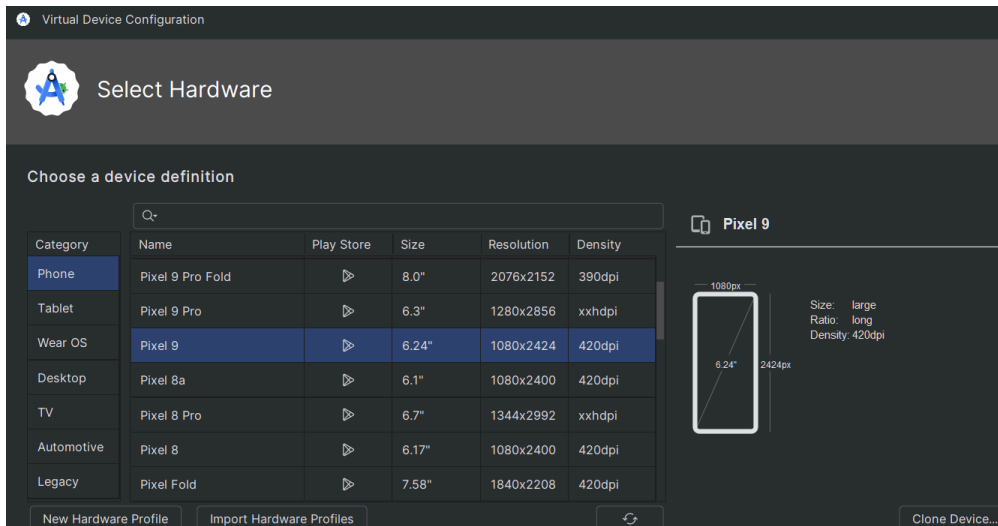


Step 8: Start Android Studio with default configurations and Download the components

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.



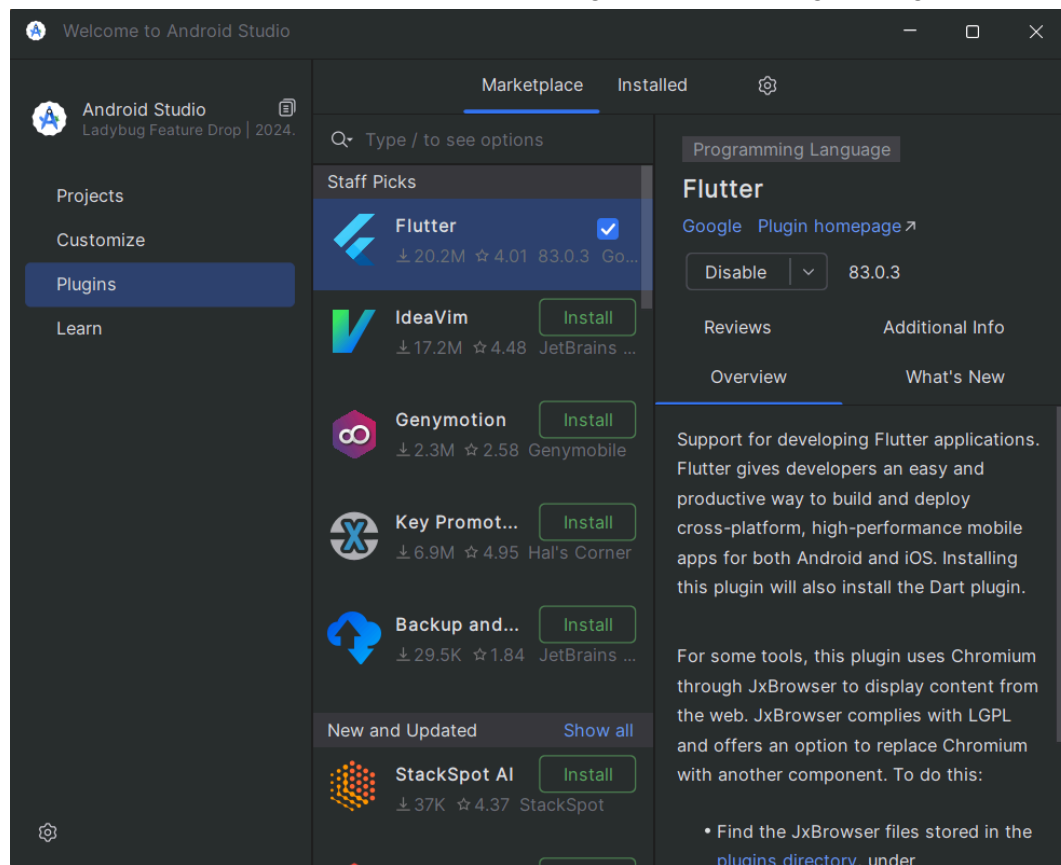
Step 8.2: Choose your device definition and click on Next.



Step 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 conclusion, you've successfully installed Flutter and Android Studio, set up the Android Emulator, and are now ready to begin developing cross-platform mobile applications. With these tools in place, you can efficiently build, test, and debug your apps. Start creating your Flutter projects, experiment with different widgets, and enjoy the development process!