

Experiment 1

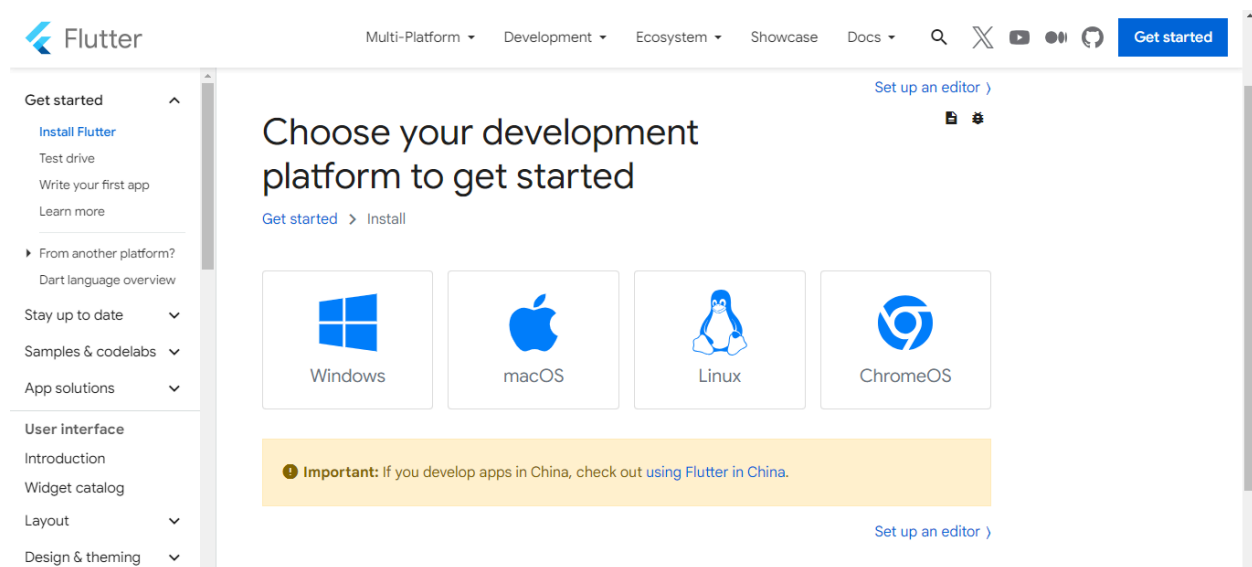
Aim: Installation and Configuration of Flutter Environment.

Theory:

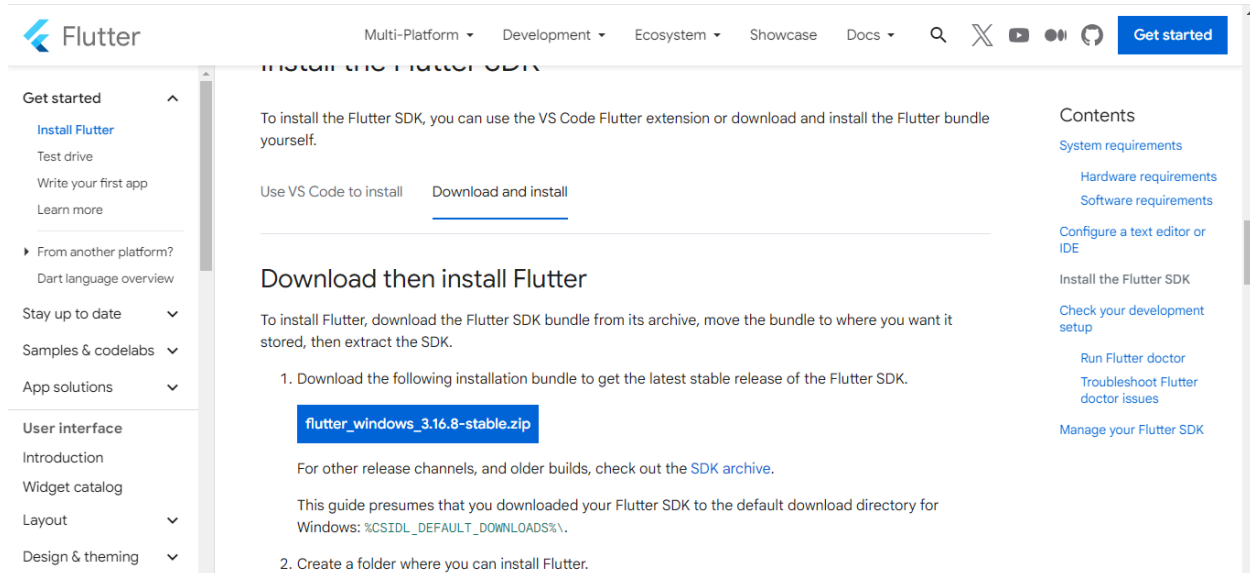
Flutter serves as Google's Mobile SDK, enabling the creation of native iOS, Android, Desktop (Windows, Linux, macOS), and Web applications using a unified codebase. In the realm of Flutter app development, Widgets take center stage as the fundamental building blocks. These Widgets, akin to structural components, come equipped with various functionalities tailored to material design. Additionally, developers have the flexibility to craft new widgets by combining existing ones, a process referred to as composition. The app's User Interface, in essence, is a collection of these simple widgets, each assigned a specific task. This approach encourages Flutter developers to view their applications as a tree of widgets.

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.



The screenshot shows the Flutter website's 'Install the Flutter SDK' page. The page has a navigation bar at the top with links for Multi-Platform, Development, Ecosystem, Showcase, Docs, and a 'Get started' button. A left sidebar contains a 'Get started' section with links like 'Install Flutter', 'Test drive', and 'Write your first app', as well as other sections like 'From another platform?', 'Stay up to date', 'Samples & code labs', 'App solutions', 'User interface', and 'Design & theming'. The main content area is titled 'Install the Flutter SDK' and includes a sub-header 'Download then install Flutter'. It provides instructions on how to install the Flutter SDK, mentioning the VS Code Flutter extension and the Flutter bundle. A list of steps is provided: 1. Download the following installation bundle to get the latest stable release of the Flutter SDK. A blue button labeled 'flutter_windows_3.16.8-stable.zip' is shown. 2. Create a folder where you can install Flutter. A right sidebar titled 'Contents' lists various links including 'System requirements', 'Hardware requirements', 'Software requirements', 'Configure a text editor or IDE', 'Install the Flutter SDK', 'Check your development setup', 'Run Flutter doctor', 'Troubleshoot Flutter doctor issues', and 'Manage your Flutter 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.

Select a Destination and Extract Files

Files will be extracted to this folder:

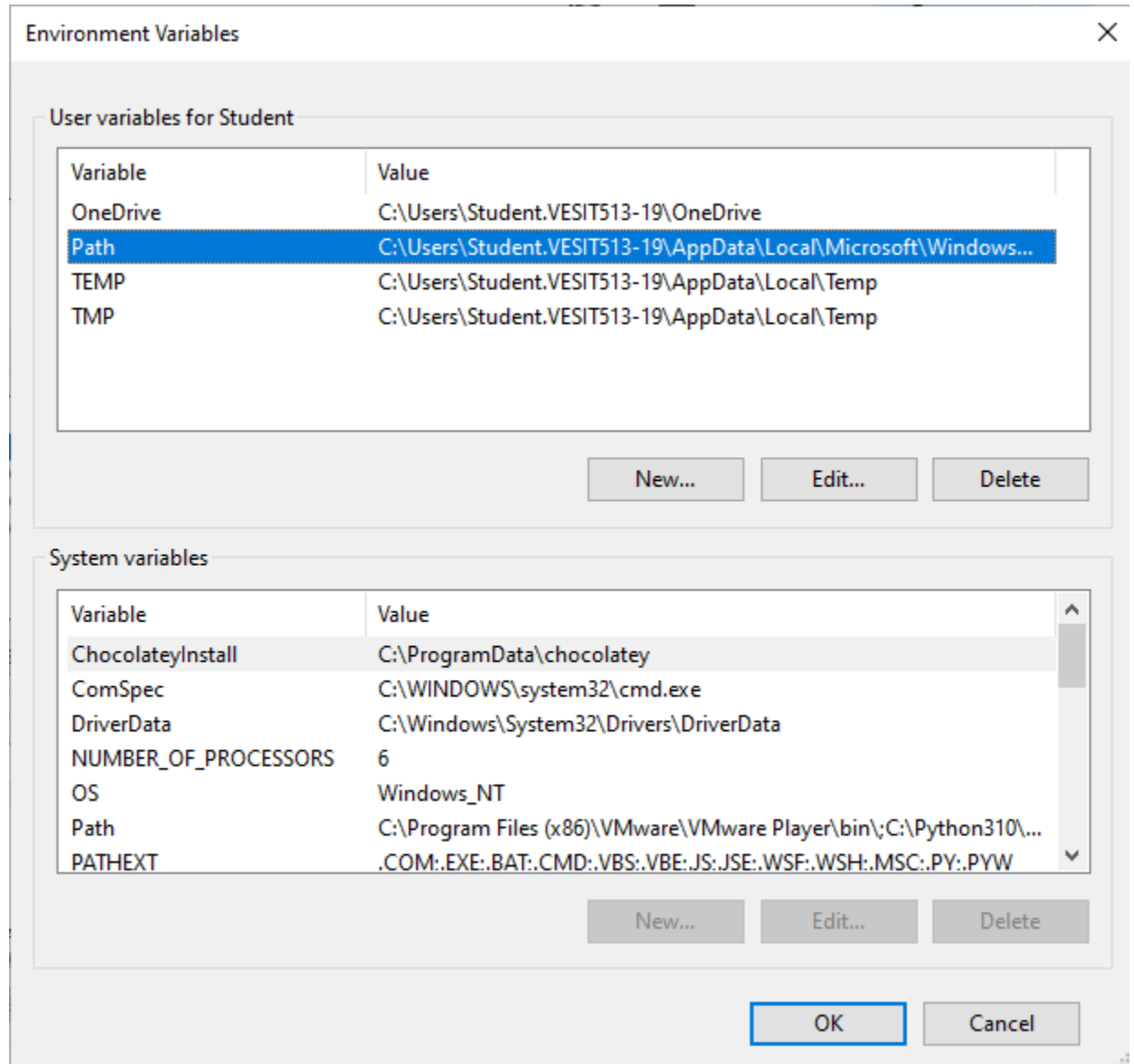
C:\flutter

Browse...

☒ Show extracted files when complete

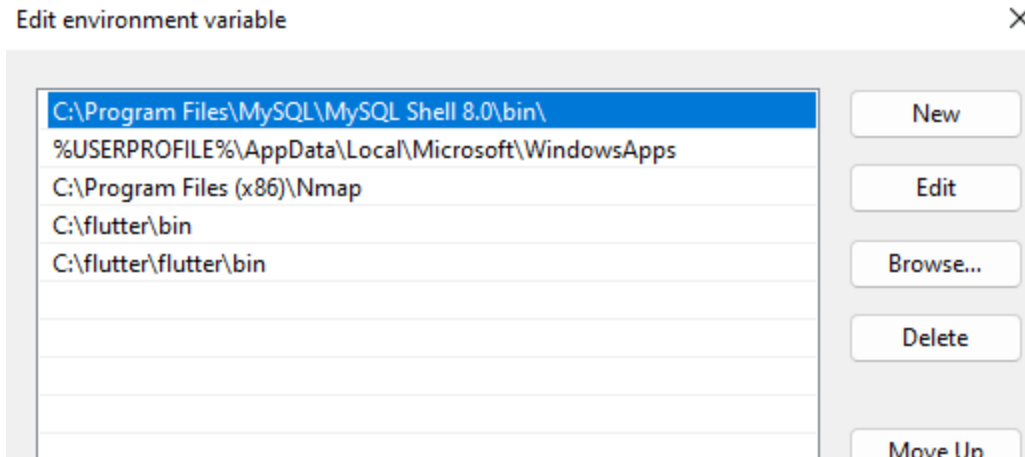
Step 4: To run the Flutter command in regular windows console, you need to update the system path to include the flutter bin directory. The following steps are required to do this:

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.

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.

```
cmd Command Prompt - flutter
Microsoft Windows [Version 10.0.22000.2538]
(c) Microsoft Corporation. All rights reserved.

C:\Users\INF513-12>flutter
Unhandled exception:
Exception: Cannot find the executable for `where`. This can happen if the System32 folder (e.g. C:\Windows\System32 ) is
removed from the PATH environment variable. Ensure that this is present and then try again after restarting the termina
l and/or IDE.
#0      throwToolExit (package:flutter_tools/src/base/common.dart:10:3)
#1      _WindowsUtils._which (package:flutter_tools/src/base/os.dart:488:7)
#2      OperatingSystemUtils.whichAll (package:flutter_tools/src/base/os.dart:101:43)
#3      AndroidSdk.locateAndroidSdk.findAndroidHomeDir (package:flutter_tools/src/android/android_sdk.dart:121:46)
#4      AndroidSdk.locateAndroidSdk (package:flutter_tools/src/android/android_sdk.dart:145:36)
#5      AppContext._generateIfNecessary.<anonymous closure> (package:flutter_tools/src/base/context.dart:104:42)
#6      _LinkedHashMapMixin.putIfAbsent (dart:collection-patch/compact_hash.dart:543:23)
#7      AppContext._generateIfNecessary (package:flutter_tools/src/base/context.dart:92:20)
#8      AppContext.get (package:flutter_tools/src/base/context.dart:121:32)
#9      androidSdk (package:flutter_tools/src/globals.dart:66:39)
#10     generateCommands (package:flutter_tools/executable.dart:180:25)
#11     main.<anonymous closure> (package:flutter_tools/executable.dart:92:11)
#12     run.<anonymous closure> (package:flutter_tools/runner.dart:49:13)
<asynchronous suspension>
#13     AppContext.run.<anonymous closure> (package:flutter_tools/src/base/context.dart:150:19)
<asynchronous suspension>
#14     main (package:flutter_tools/executable.dart:90:3)
```

```
Command Prompt - flutter - flutter doctor
#13   AppContext.run.<anonymous closure> (package:flutter_tools/src/base/context.dart:150:19)
<asynchronous suspension>
#14   main (package:flutter_tools/executable.dart:90:3)
<asynchronous suspension>

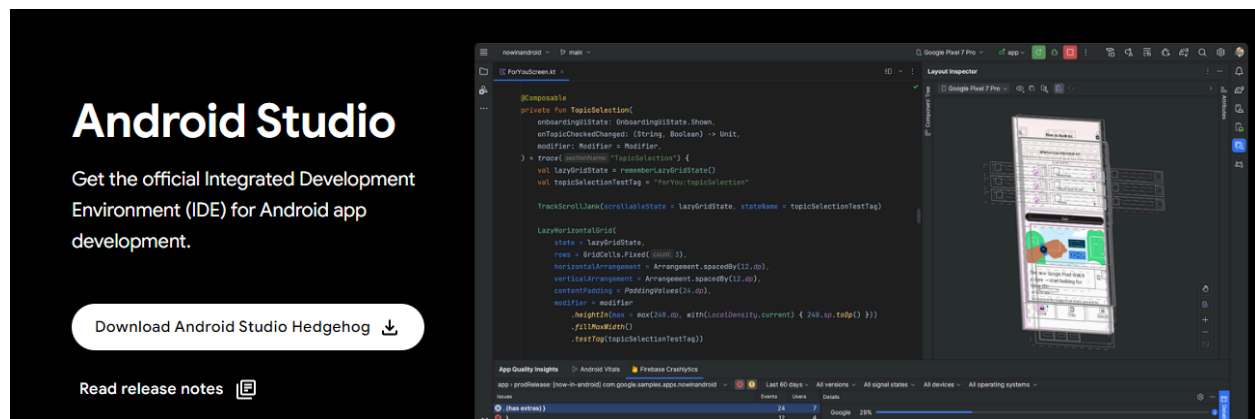
C:\Users\INFT513-12>flutter doctor
Unhandled exception:
Exception: Cannot find the executable for `where`. This can happen if the System32 folder (e.g. C:\Windows\System32) is removed from the PATH environment variable. Ensure that this is present and then try again after restarting the command prompt and/or IDE.

#0   throwToolExit (package:flutter_tools/src/base/common.dart:10:3)
#1   _WindowsUtils._which (package:flutter_tools/src/base/os.dart:488:7)
#2   OperatingSystemUtils.whichAll (package:flutter_tools/src/base/os.dart:101:43)
#3   AndroidSdk.locateAndroidSdk.findAndroidHomeDir (package:flutter_tools/src/android/android_sdk.dart:121:42)
#4   AndroidSdk.locateAndroidSdk (package:flutter_tools/src/android/android_sdk.dart:145:36)
#5   AppContext._generateIfNecessary.<anonymous closure> (package:flutter_tools/src/base/context.dart:104:42)
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<asynchronous suspension>
#13  AppContext.run.<anonymous closure> (package:flutter_tools/src/base/context.dart:150:19)
<asynchronous suspension>
#14  main (package:flutter_tools/executable.dart:90:3)
<asynchronous suspension>
```

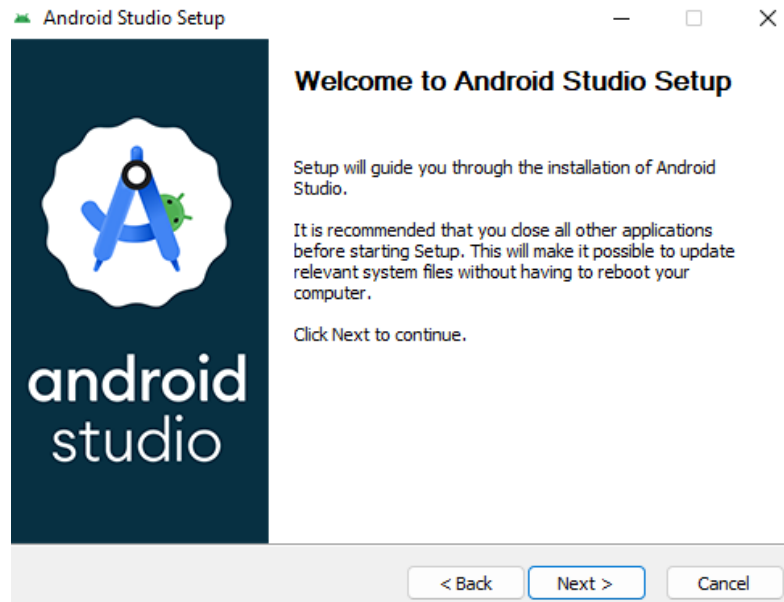
Step 6: When you run the above command, it will analyze the system and show its report, as shown in the below image. Here, you will find the details of all missing tools, which required to run Flutter as well as the development tools that are available but not connected with the Device.

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.

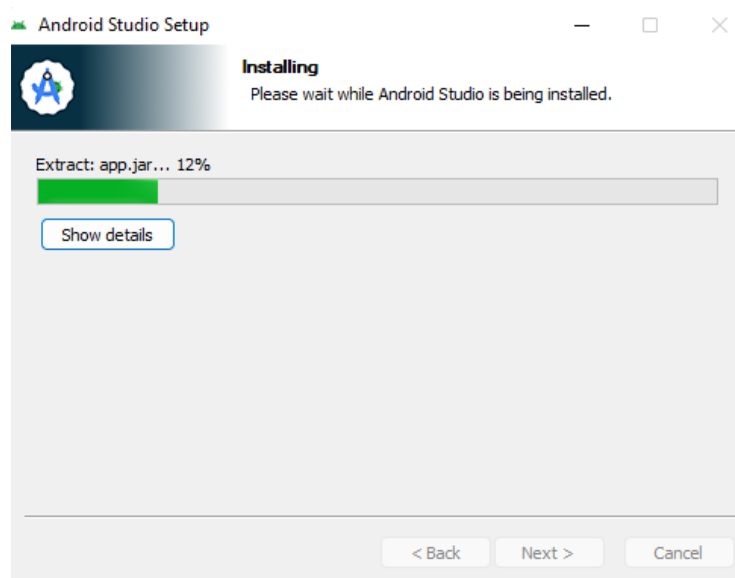
Step 7.1: Download the latest Android Studio executable or zip file from the official site.



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

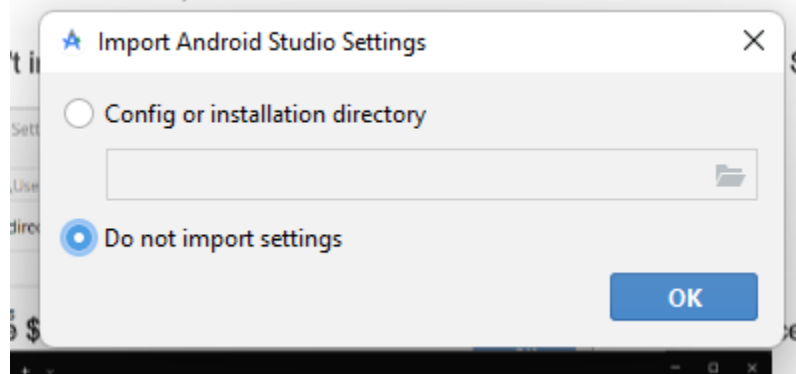


Step 7.3: Follow the steps of the installation wizard. Once the installation wizard completes, you will get the following screen.



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.

above screen, click Next-> Finish. Once the Finish button is clic



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

```
C:\Users\INFT513-12>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.

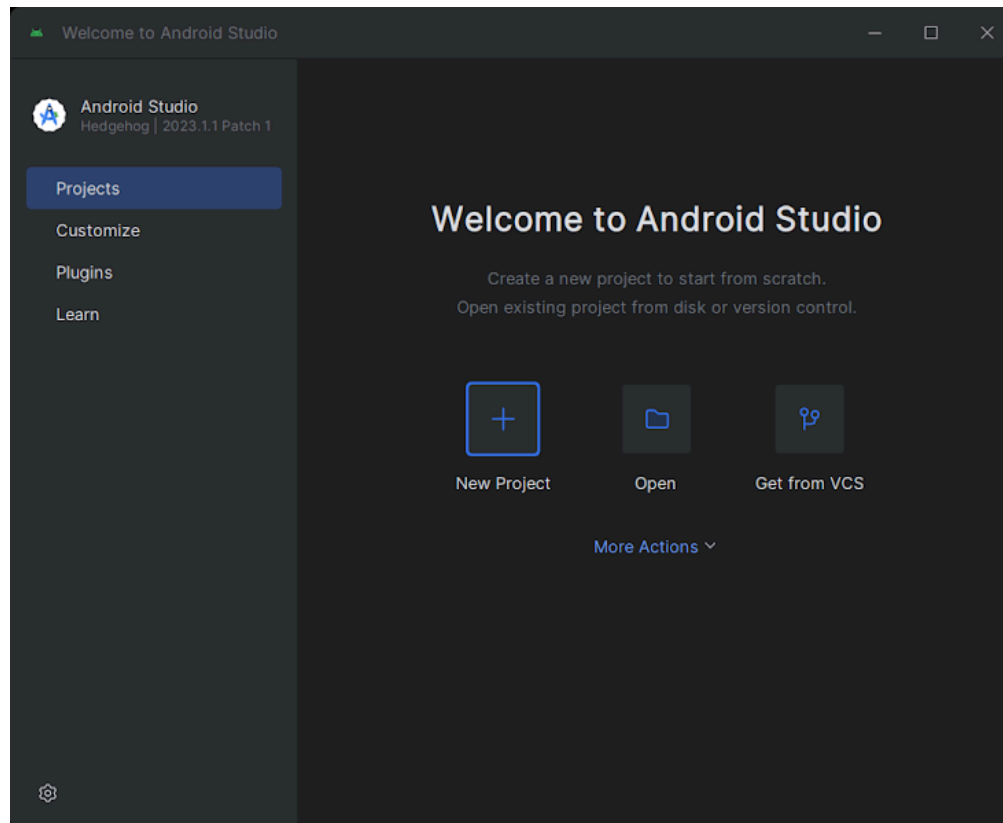
Usage: flutter <command> [arguments]

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.
```

```
C:\Users\INFT513-12>flutter doctor
Doctor summary (to see all details, run flutter doctor -v):
[✗] Flutter (the doctor check crashed)
     X Due to an error, the doctor check did not complete. If the error message below is not helpful
     X about this issue at https://github.com/flutter/flutter/issues.
     X Exception: Cannot find the executable for `where`. This can happen if the System32 folder (e.
     X C:\Windows\System32 ) is removed from the PATH environment variable. Ensure that this is pres
     X again after restarting the terminal and/or IDE.
[✓] Windows Version (Installed version of Windows is version 10 or higher)
[✗] Android toolchain - develop for Android devices
     X cmdline-tools component is missing
     X Run `path/to/sdkmanager --install "cmdline-tools;latest"`
     X See https://developer.android.com/studio/command-line for more details.
[✓] Chrome - develop for the web
[!] Visual Studio - develop Windows apps (Visual Studio Community 2019 16.11.17)
     X Visual Studio is missing necessary components. Please re-run the Visual Studio installer for
     X development with C++ workload, and include these components:
       MSVC v142 - VS 2019 C++ x64/x86 build tools
       - If there are multiple build tool versions available, install the latest
```

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

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.



Conclusion:

Building a strong Flutter development environment is like putting together pieces of a puzzle, where each puzzle piece is equally important. It all starts with downloading the Flutter SDK and moving on to configuring an Android emulator and adding crucial plugins in Android Studio. After we configure an Android emulator, it feels as if we create a dynamic aspect to your puzzle. We then ensure that everything fits seamlessly on Windows, so that designing cross-platform apps becomes easy. The detailed installation, setting up paths, and integrating plugins creates a well-prepared Flutter workspace, making the journey of developing native iOS, Android, Desktop, and Web applications from a single codebase a smooth and enjoyable experience.