UNIVERSITY OF ALBERTA
FACULTY OF SCIENCE
Department of Computing Science

# SOFTWARE DESIGN AND ARCHITECTURE

Android Studio 4, API 29 (Android 10)
Windows

**Android Studio Tutorial - Windows Users**

---

This installation tutorial was completed on Windows 10, but the instructions should not differ for other versions of Windows as long as they are compatible with Android Studio.

## Content



---

## 1. **Download** Android Studio (version 4.1.0 or newer):

https://developer.android.com/studio

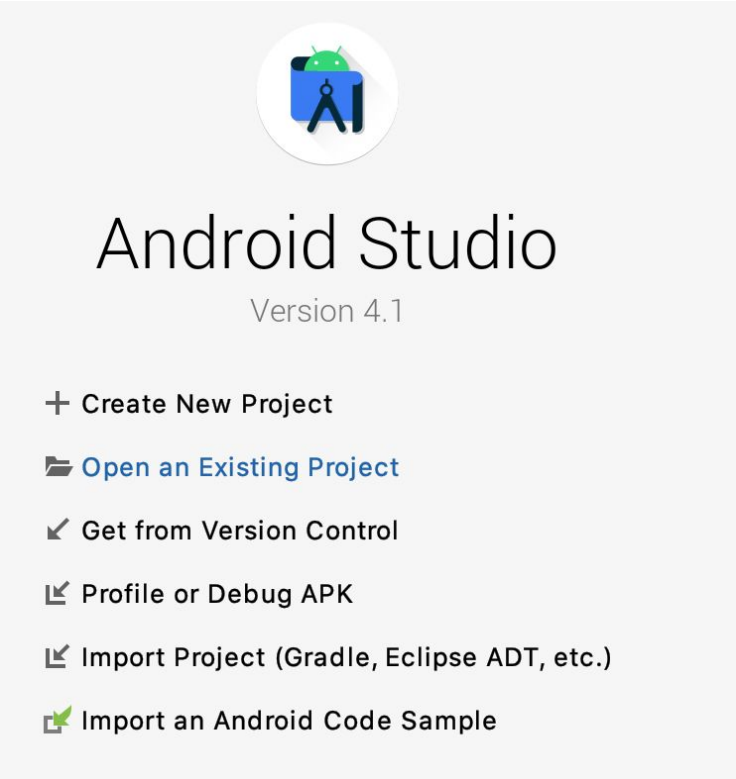
---

## 2. Install it

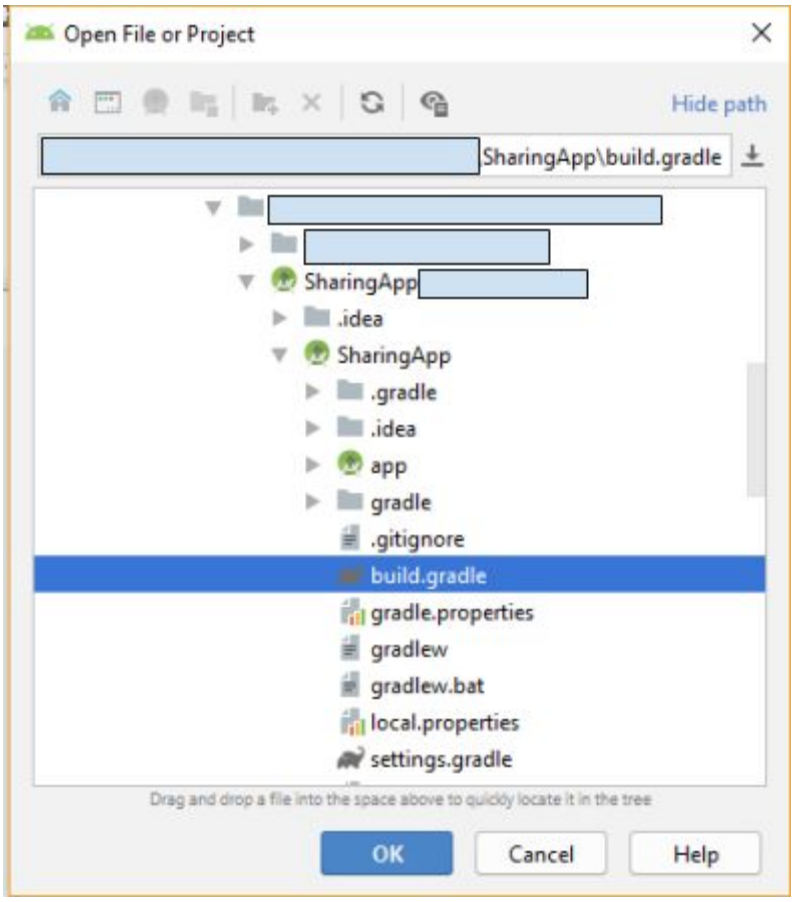
- Leave the Android SDK and Android Virtual Device boxes checked -- they are necessary.
- It may take a while for the program to install.
- If asked to import settings from a previous version/setup, ignore and continue with the setup.

## 3. Open an existing Android Studio project.

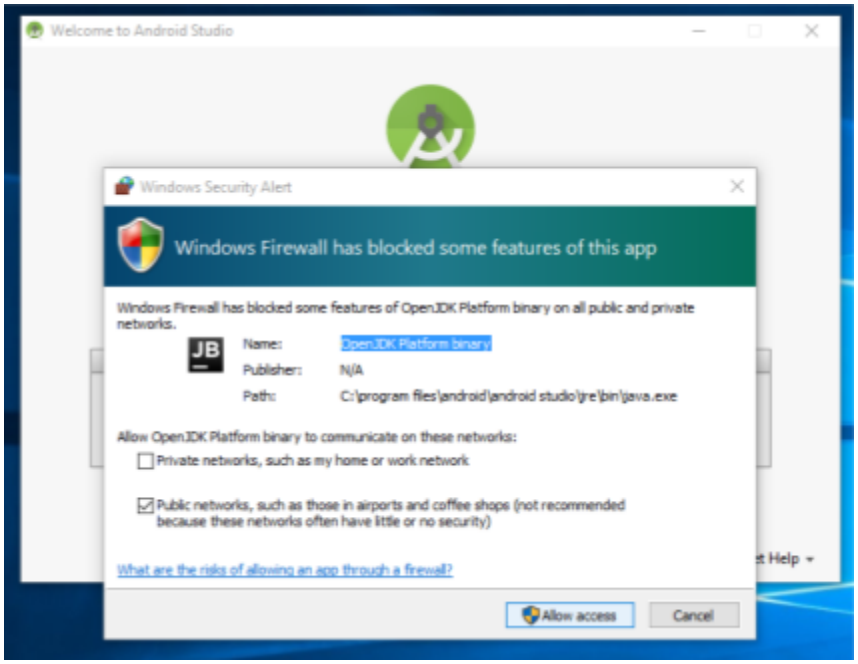
- Open Android Studio and click **“Open an existing Android Studio project”**



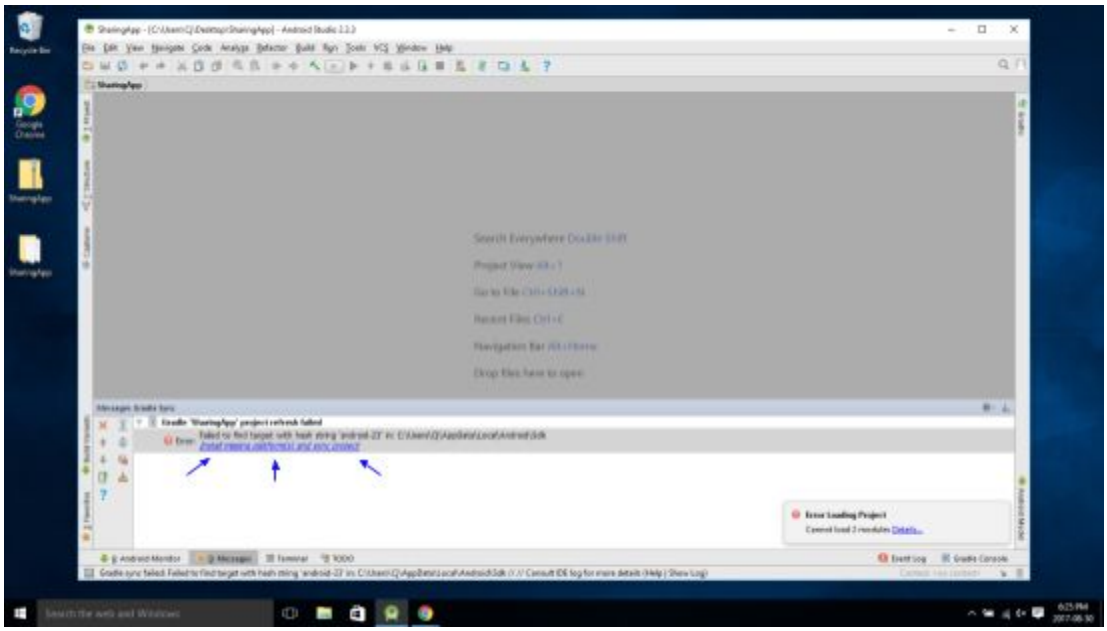

- Download the provided codebase. Navigate and select **build.gradle**




- Once you click **OK** it will start 'Building "SharingApp" Gradle project info', which may take a few minutes to complete.
- You may receive this message from Windows Firewall when it is done. For the purposes of this app, it is alright to select 'Public networks' and click 'Allow Access'.



- You may need to download or update Java -- Android Studio will let you know when you try to build the project.



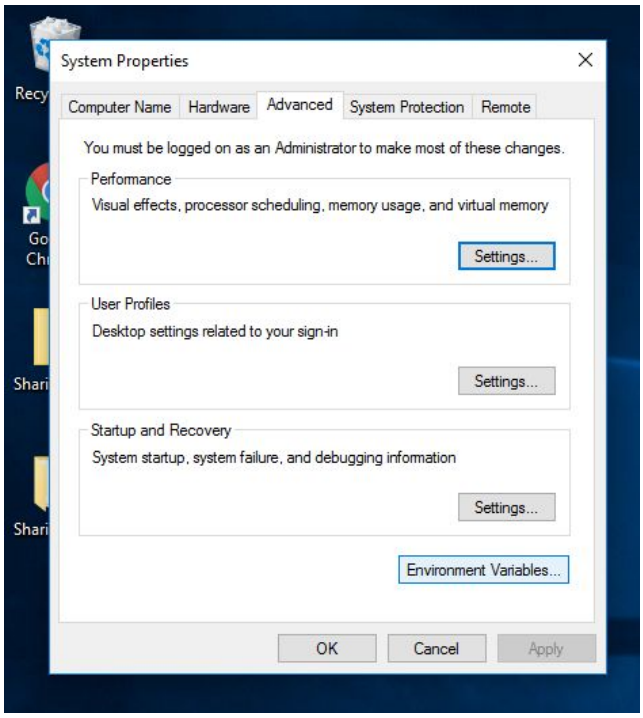
- Update everything it prompts you to update by clicking on the blue link.
- When it is done updating, it will still show the previous prompt and clicking on it will do nothing. Restart Android Studio to fix this and no prompts should pop up.
- At some point, if you've downloaded/updated to the correct version of Java, you must complete the extra step below or you will continue getting errors.

---

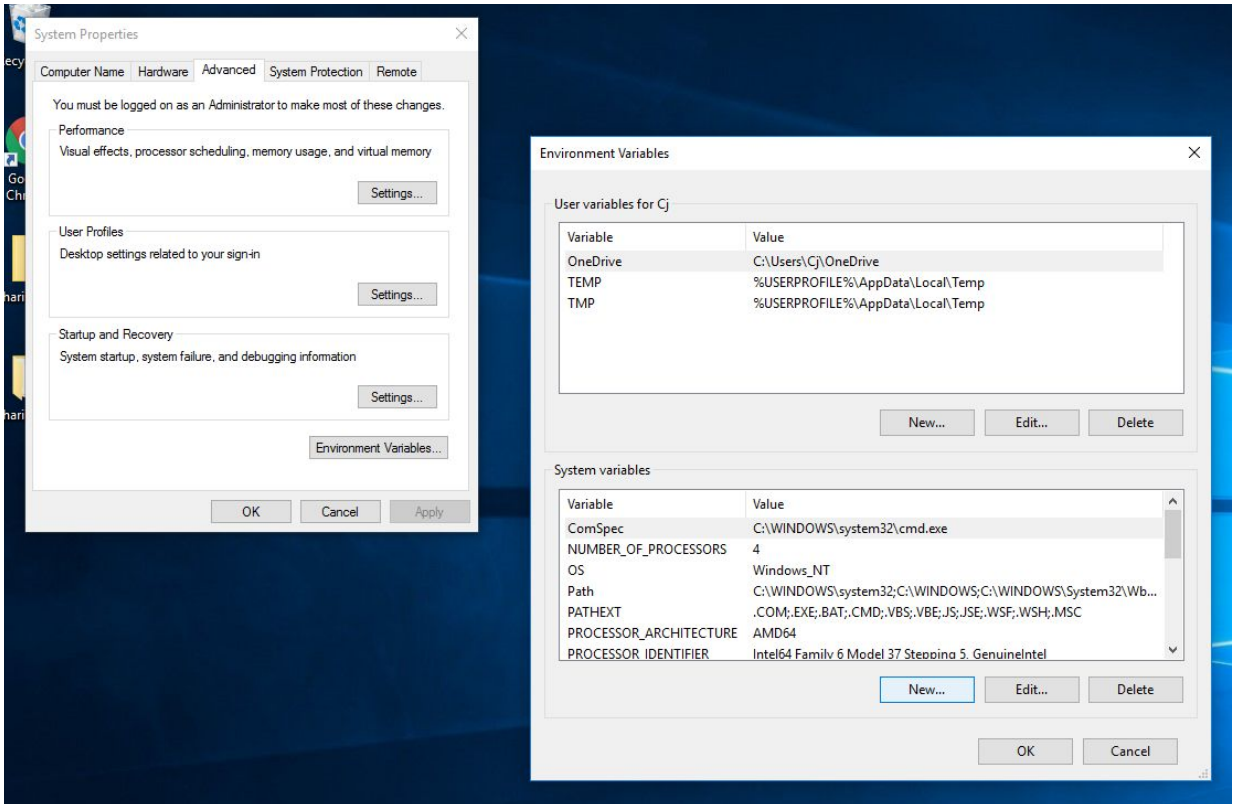
## 4. EXTRA STEP:

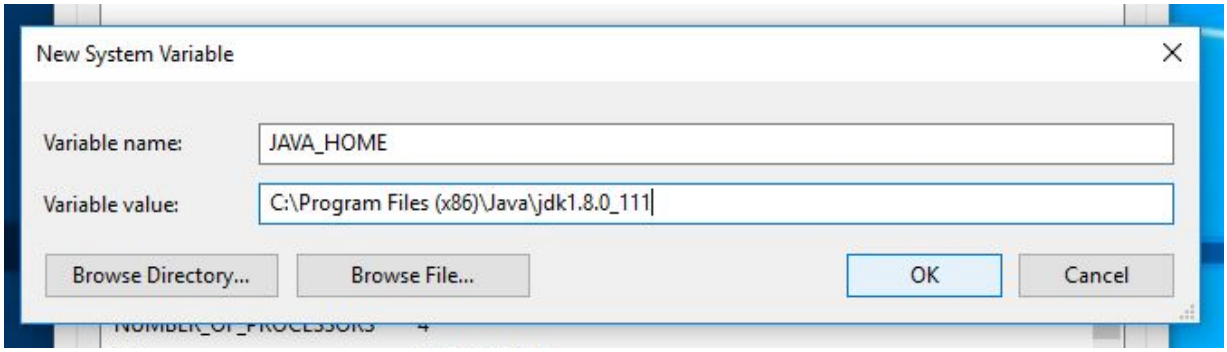
This step is for Windows users only. Android Studio will **not** run the project if you do not complete this step.

- Go to System Properties > Advanced > Environment Variables. You can find System Properties under the advanced system settings in the Control Panel.




- Create a New System Variable called JAVA_HOME. Android Studio will use JAVA_HOME to find the version of java that you require and is saved in Program Files by default.





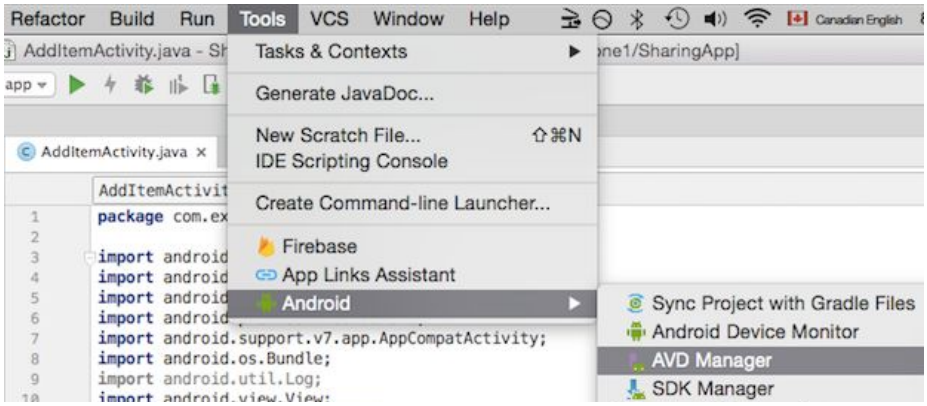

- After accepting the new System Variable, you can close these windows. No other variables need to be made, nor do you have to delete any others.

---

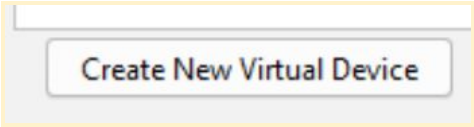
## 5. Create an Android Virtual Device (AVD)

Next you will need to **create an Android Virtual Device (AVD)** i.e., an android emulator.

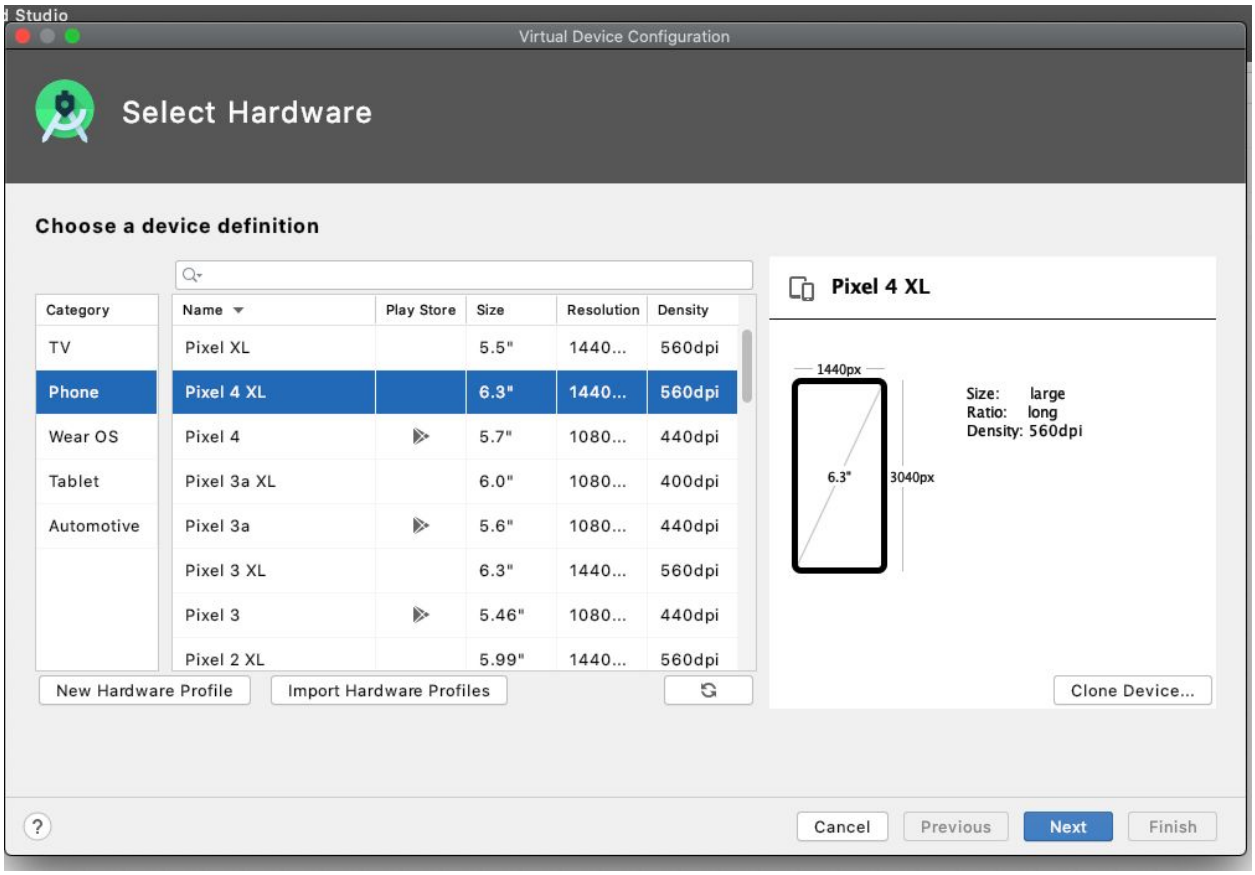
- Open the AVD Manager: **Tools → Android → AVD Manager**

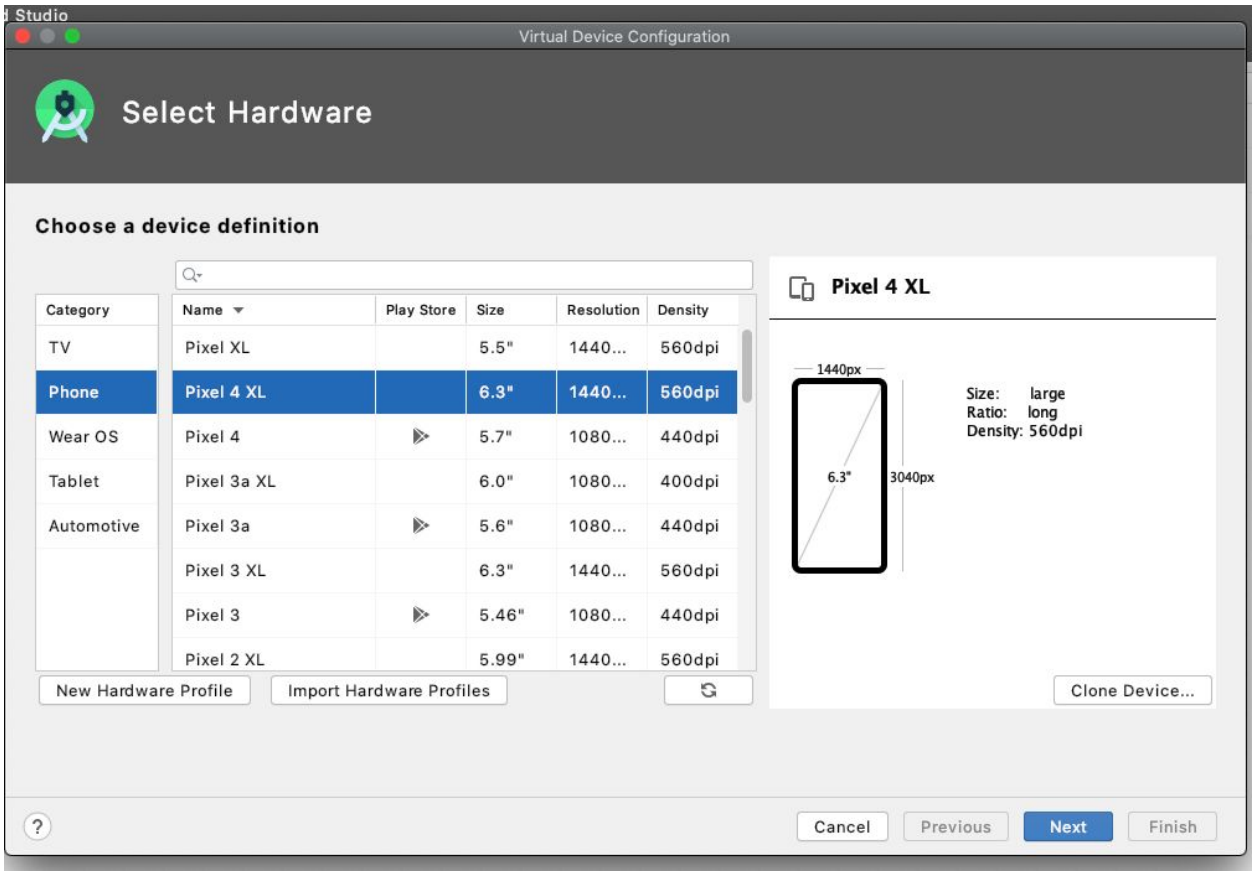



- Click **Create Virtual Device**




- Select any device of your choice; here we use **Pixel 4 XL.** Click **Next**


Studio
Virtual Device Configuration
Select Hardware
Choose a device definition
Category
Name
Play Store
Size
Resolution
Density
TV
Phone
Wear OS
Tablet
Automotive
Pixel XL 5.5" 1440... 560dpi
Pixel 4 XL 6.3" 1440... 560dpi
Pixel 4 5.7" 1080... 440dpi
Pixel 3a XL 6.0" 1080... 400dpi
Pixel 3a 5.6" 1080... 440dpi
Pixel 3 XL 6.3" 1440... 560dpi
Pixel 3 5.46" 1080... 440dpi
Pixel 2 XL 5.99" 1440... 560dpi
Pixel 4 XL
1440px
6.3"
3040px
Size: large
Ratio: long
Density: 560dpi
New Hardware Profile
Import Hardware Profiles
Clone Device...
Cancel
Previous
Next
Finish


Studio
Virtual Device Configuration
Select Hardware
Choose a device definition
Category
Name
Play Store
Size
Resolution
Density
TV
Phone
Wear OS
Tablet
Automotive
Pixel XL 5.5" 1440... 560dpi
Pixel 4 XL 6.3" 1440... 560dpi
Pixel 4 5.7" 1080... 440dpi
Pixel 3a XL 6.0" 1080... 400dpi
Pixel 3a 5.6" 1080... 440dpi
Pixel 3 XL 6.3" 1440... 560dpi
Pixel 3 5.46" 1080... 440dpi
Pixel 2 XL 5.99" 1440... 560dpi
Pixel 4 XL
1440px
6.3"
3040px
Size: large
Ratio: long
Density: 560dpi
New Hardware Profile
Import Hardware Profiles
Clone Device...
Cancel
Previous
Next
Finish

-

- Select ***Q*** **-** API level 29 (Aka Android 10). You may have to download this first and this may take a while.

| Release Name | API Level | ABI | Target |
|---|---|---|---|
| **R** | R | x86 | Android 11.0 (Google APIs) |
| **R** | 30 | x86 | Android 11.0 (Google APIs) |
| **Q** | 29 | x86 | Android 10.0 (Google APIs) |
| *Oreo* Download | *27* | *x86* | *Android 8.1 (Google APIs)* |
| **Oreo** | 26 | x86 | Android 8.0 (Google APIs) |
| *Nougat* Download | *25* | *x86* | *Android 7.1.1 (Google APIs)* |
| *Nougat* Download | *24* | *x86* | *Android 7.0 (Google APIs)* |
| *Marshmallow* Download | *23* | *x86* | *Android 6.0 (Google APIs)* |
| *Lollipop* Download | *22* | *x86* | *Android 5.1 (Google APIs)* |

- After accepting the agreement, it will prompt you to give it a name to identify it. The name will have no effect on how the program runs, as long as you know which one you need to run the app.

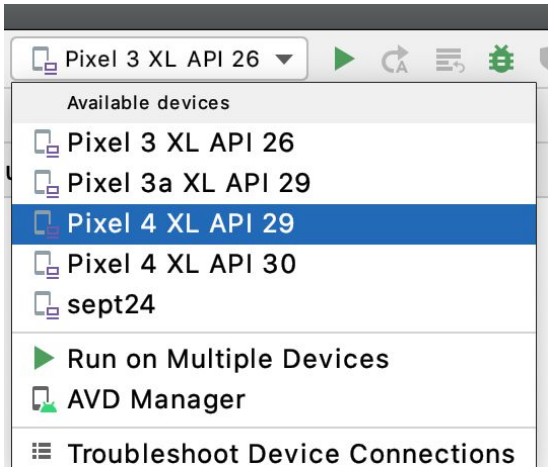

-

- Click **Finish** when this is complete.

---

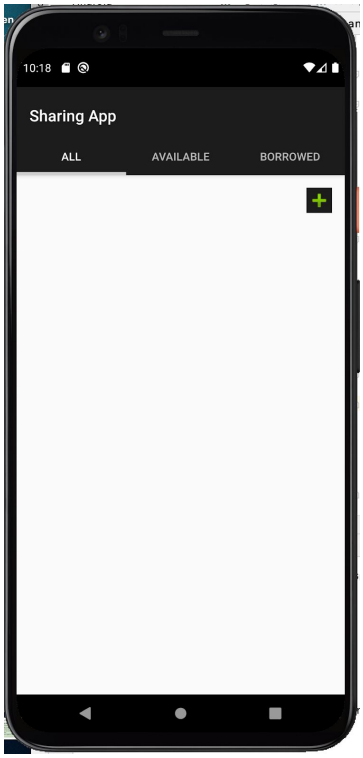
## 6. Run the App

- Select a virtual device from the drop down menu




- Click the **play button** to run the app.


- The emulator takes a while to load, install and run your app. Be patient!
- Once your emulator finish loading and the app will start:

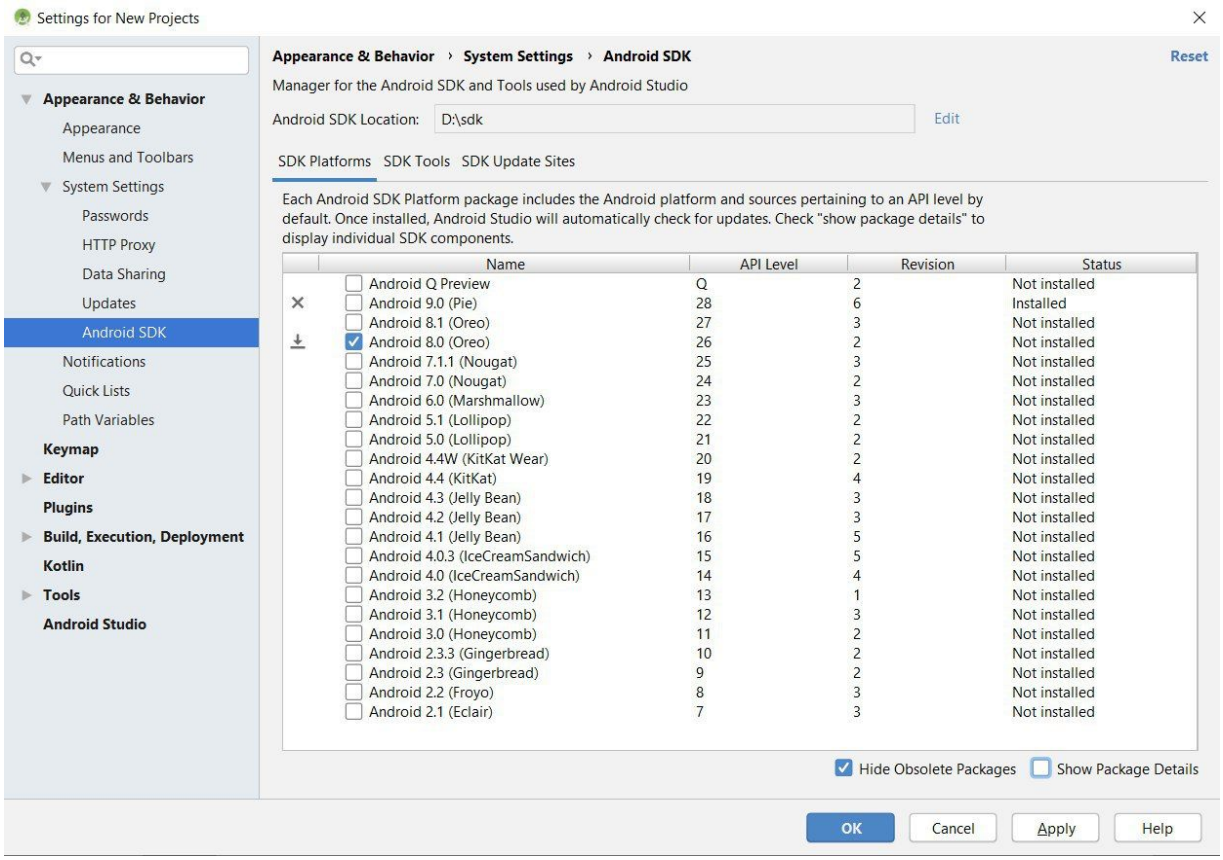


**Congrats,** you can now start programming in Android Studio! Play around with the app to see how it works!

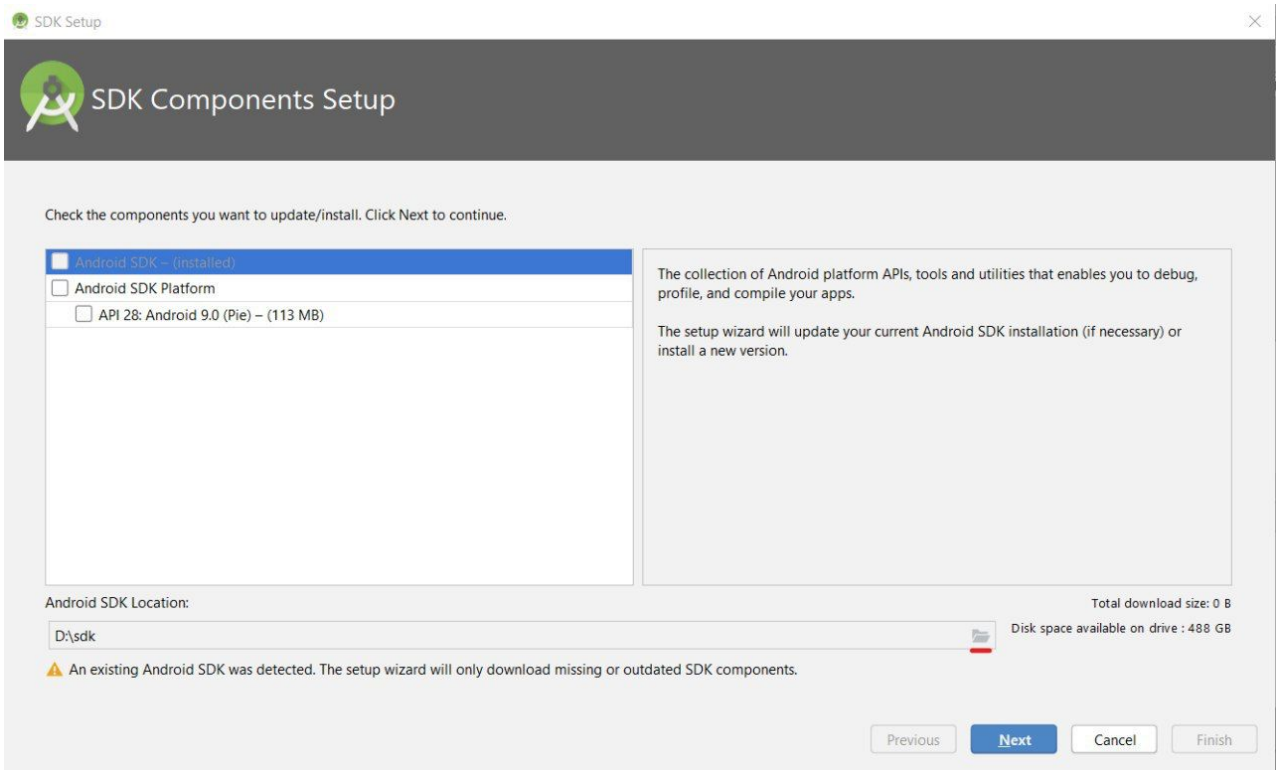
# Extra: Common Problems:

## 1. The SDA package(s) is missing

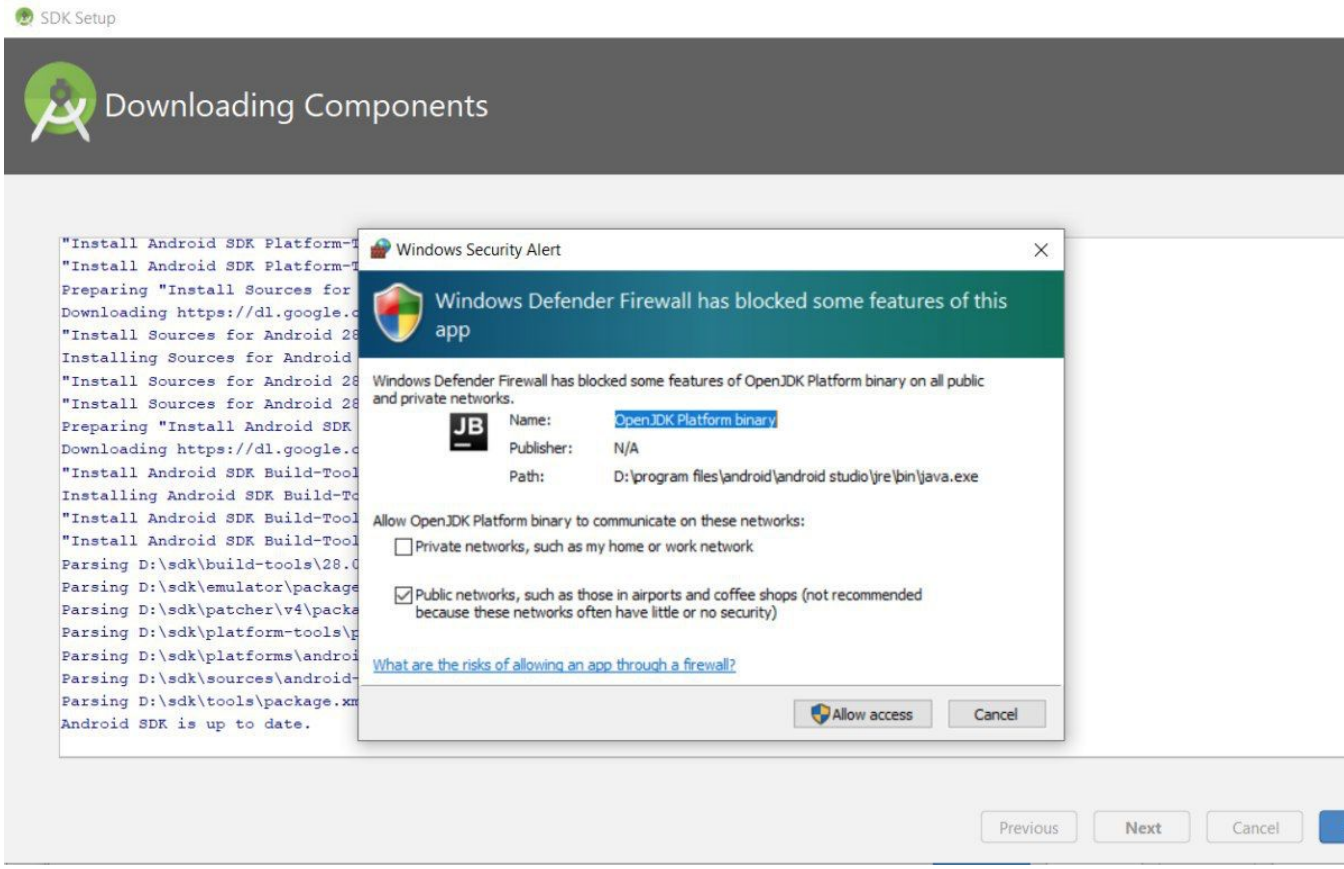
If the SDK package(s) is missing, go into **Tools > SDK Manager.** Once you open the SDA Manager, this window should pop-up. If you want to specify a path for Android SDK Location, you can click “Edit” and change it.




If you click “Edit”, this window should pop-up:




Click on the folder icon to specify a path for it. You may receive this message from Windows Firewall when it is done. For the purposes of this app, it is alright to select ‘Public networks’ and click ‘Allow Access’.

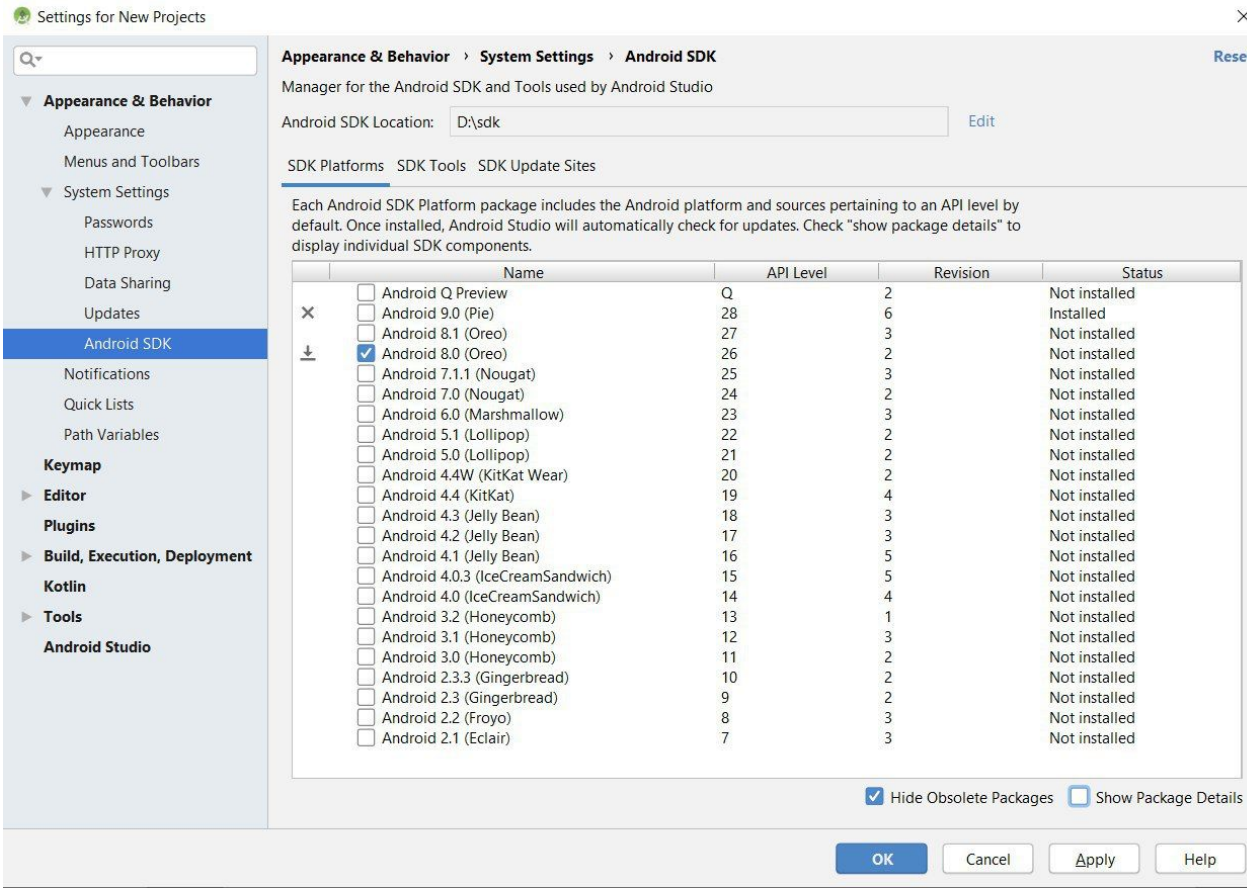



Once it’s done the appropriate SDK package(s) should be installed.

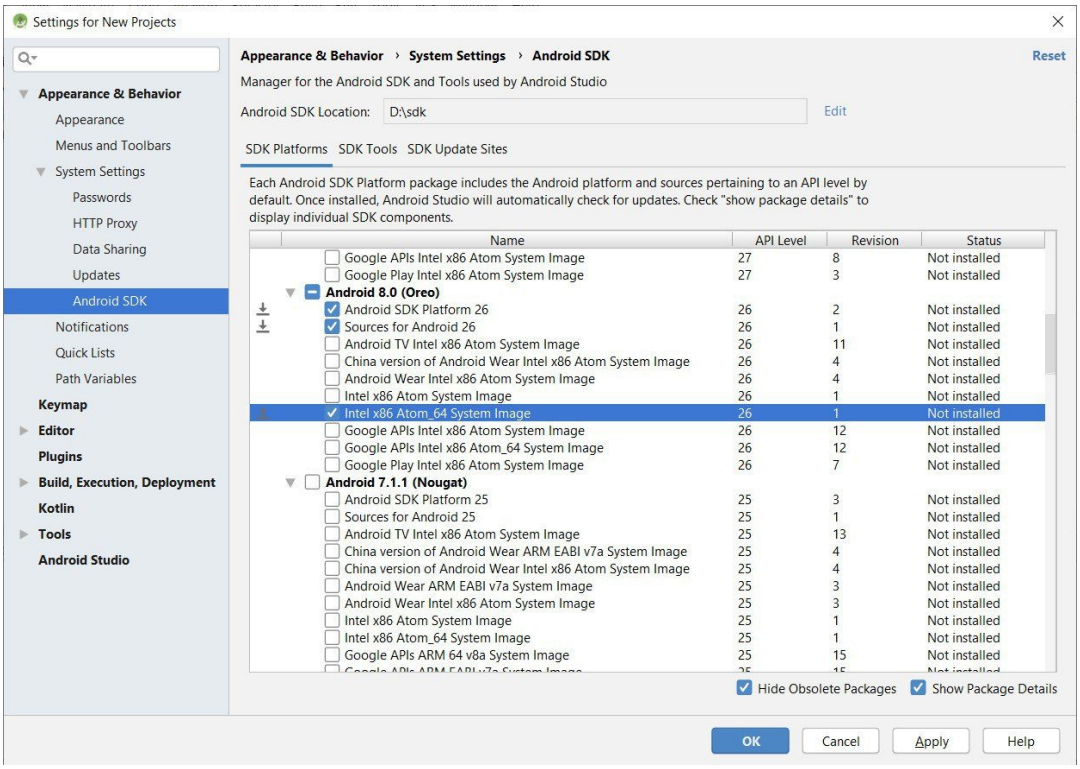
## 2. The Emulator Won't Show Up

If you are running into a problem that your emulator won't show up, try to complete the following steps:

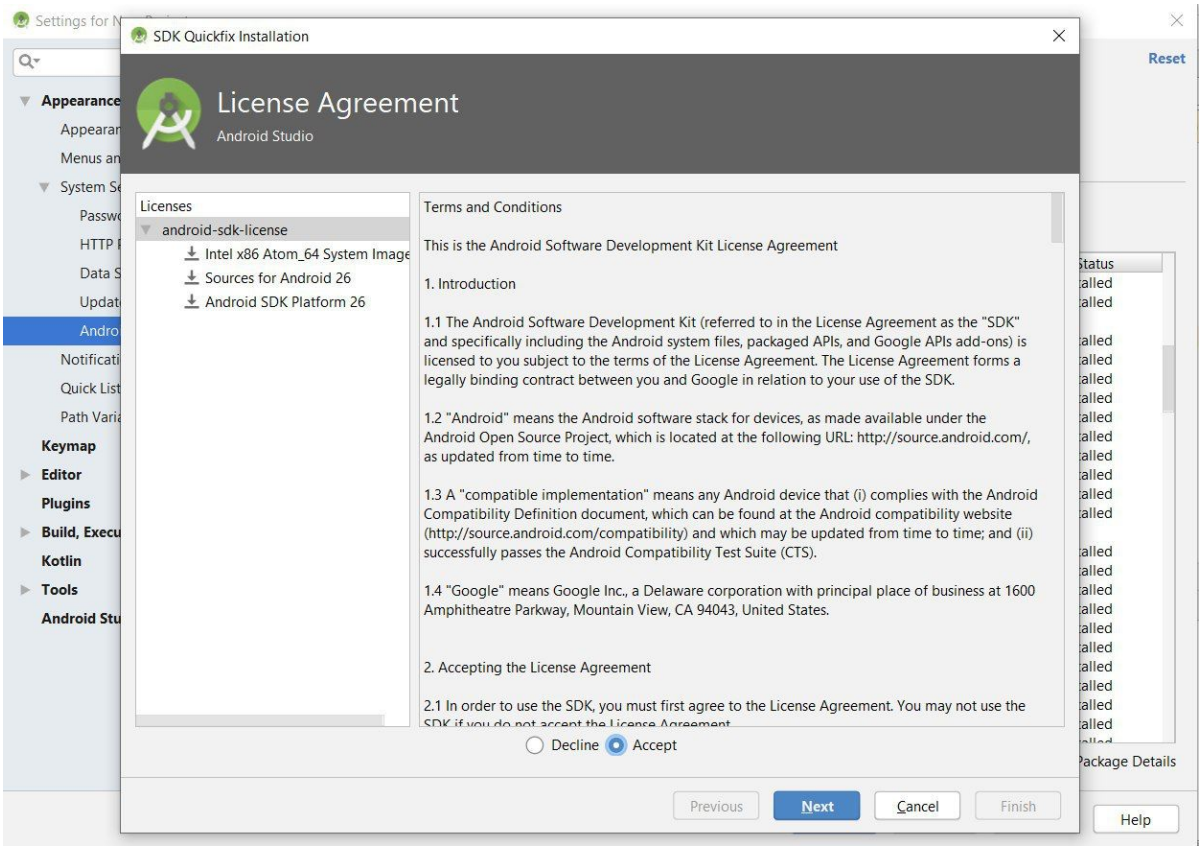
- Click **Tool -> SDK Manager**, then click on "Show Package Details":




- Depending on the version of your Windows Processor, (eg. 32-bit vs 64-bit), click on either **Intel x86 Atom System Image** for 32-bit or **Intel x86 Atom_64 System Image** for 64-bit. In our case, we have the 64-bit so we are going with the **Atom_64** one. Click Apply.



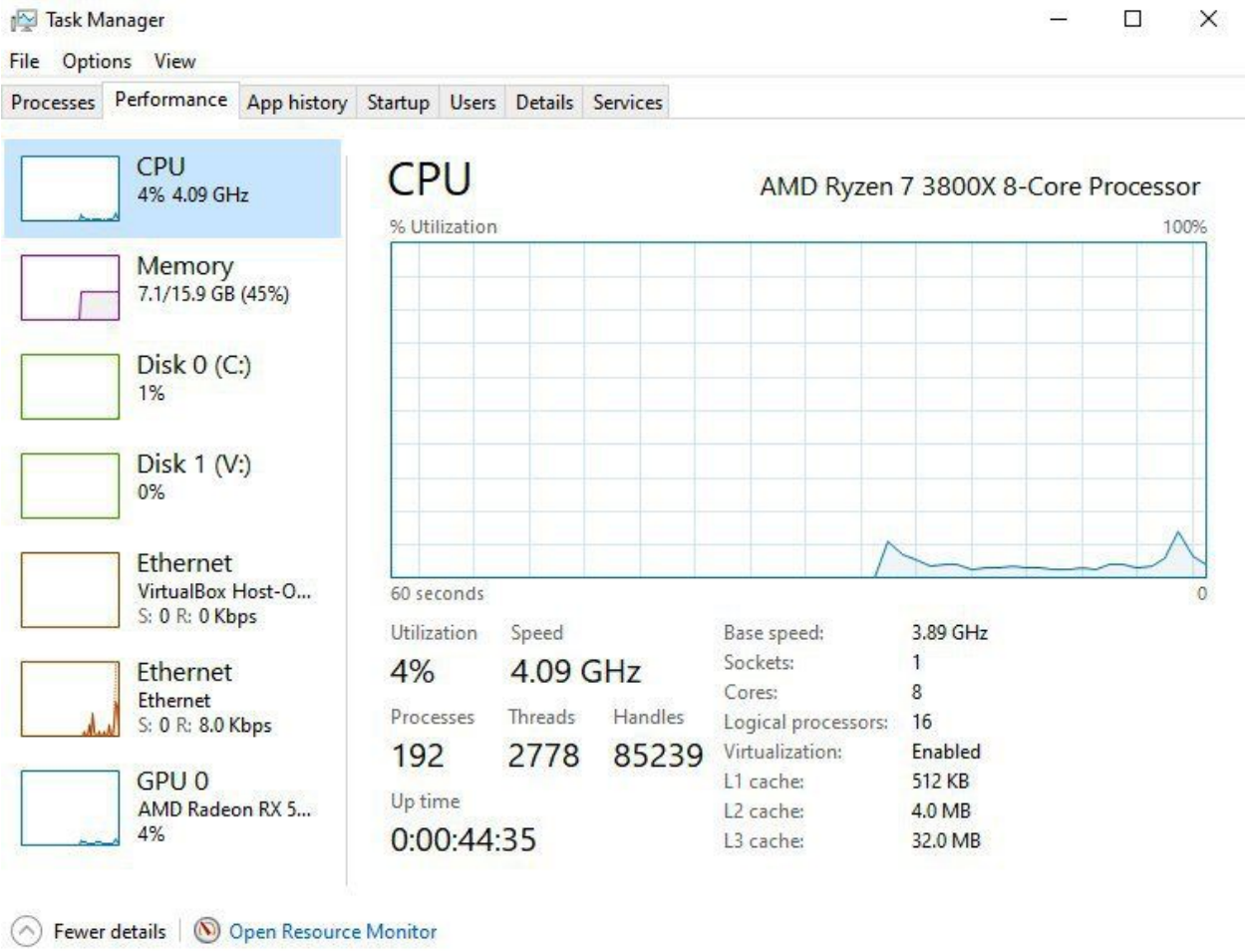

After clicking Apply, this window will pop-up:




Accept the terms and select Finish. Re-run your app and your emulator should work!

## 3. Enable Virtualization in your BIOS

A number of people using Windows 10 machines have run into problems when attempting to use the Android Studio 4.
To fix this, you may consider to enable virtualization in your BIOS.
It can sometimes be tricky to enter the BIOS configuration on a Windows 10 machine, since there may be a feature to prevent the computer from shutting down all the way. If you regularly see an "interrupt normal setup" message when starting your computer, you can press whatever key is included in that message to access the BIOS menu. You can also follow these instructions, which are to hold shift and select "Shut Down". Then hold F2 and press the power button to turn your computer back on. Do not let F2 go until you view the BIOS menu.
Then you will need to locate the virtualization option in the BIOS menu. On the computer I tested this with, there was a virtualization option at the top level of the menu, with a sub-menu item to enable or disable virtualization. Your BIOS configuration may look different. You can search "enable virtualization windows 10" for a more specific example of enabling virtualization for your computer. For example, here is another set of instructions that you may find helpful:
link 1: https://www.asus.com/ca-en/support/FAQ/1013015/
link 2: https://www.tutorialspoint.com/windows10/windows10_virtualization.htm
After you have ensured that virtualization is enabled for your computer, save your changes. Exit the BIOS configuration and wait for your computer to start normally. Then try running the Android Studio 4 again.
**To verify if virtualization is enabled or not:**
CTRL + ALT + DELETE to open Task Manager > Performance > CPU


Task Manager
File Options View
Processes Performance App history Startup Users Details Services
CPU
4% 4.09 GHz
Memory
7.1/15.9 GB (45%)
Disk 0 (C:)
1%
Disk 1 (V:)
0%
Ethernet
VirtualBox Host-O...
S: 0 R: 0 Kbps
Ethernet
Ethernet
S: 0 R: 8.0 Kbps
GPU 0
AMD Radeon RX 5...
4%
CPU
AMD Ryzen 7 3800X 8-Core Processor
% Utilization
100%
60 seconds
0
Utilization
4%
Speed
4.09 GHz
Processes
192
Threads
2778
Handles
85239
Up time
0:00:44:35
Base speed: 3.89 GHz
Sockets: 1
Cores: 8
Logical processors: 16
Virtualization: Enabled
L1 cache: 512 KB
L2 cache: 4.0 MB
L3 cache: 32.0 MB
Fewer details
Open Resource Monitor