

# Getting started with Android Part 1

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**WATERLOO**

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- Android Studio
- Hello World
- API levels
- Project structure and files
- Dealing with UI components
- App lifecycle

# Installing Android Studio

- Install JDK 7+ if you still don't have it
  - <http://www.oracle.com/technetwork/java/javase/downloads/>
- Download:
  - <https://developer.android.com/studio/>
- Instructions
  - <https://developer.android.com/studio/install.html>
- Hardware Acceleration
  - <https://developer.android.com/studio/run/emulator-acceleration.html>
- Troubleshooting
  - [https://docs.google.com/document/d/1w1Xn\\_hnSAODAAtdRDp7haYPBtEwX\\_17Htpf8Wpgbu6w/pub?embedded=true](https://docs.google.com/document/d/1w1Xn_hnSAODAAtdRDp7haYPBtEwX_17Htpf8Wpgbu6w/pub?embedded=true)

# Compiling project

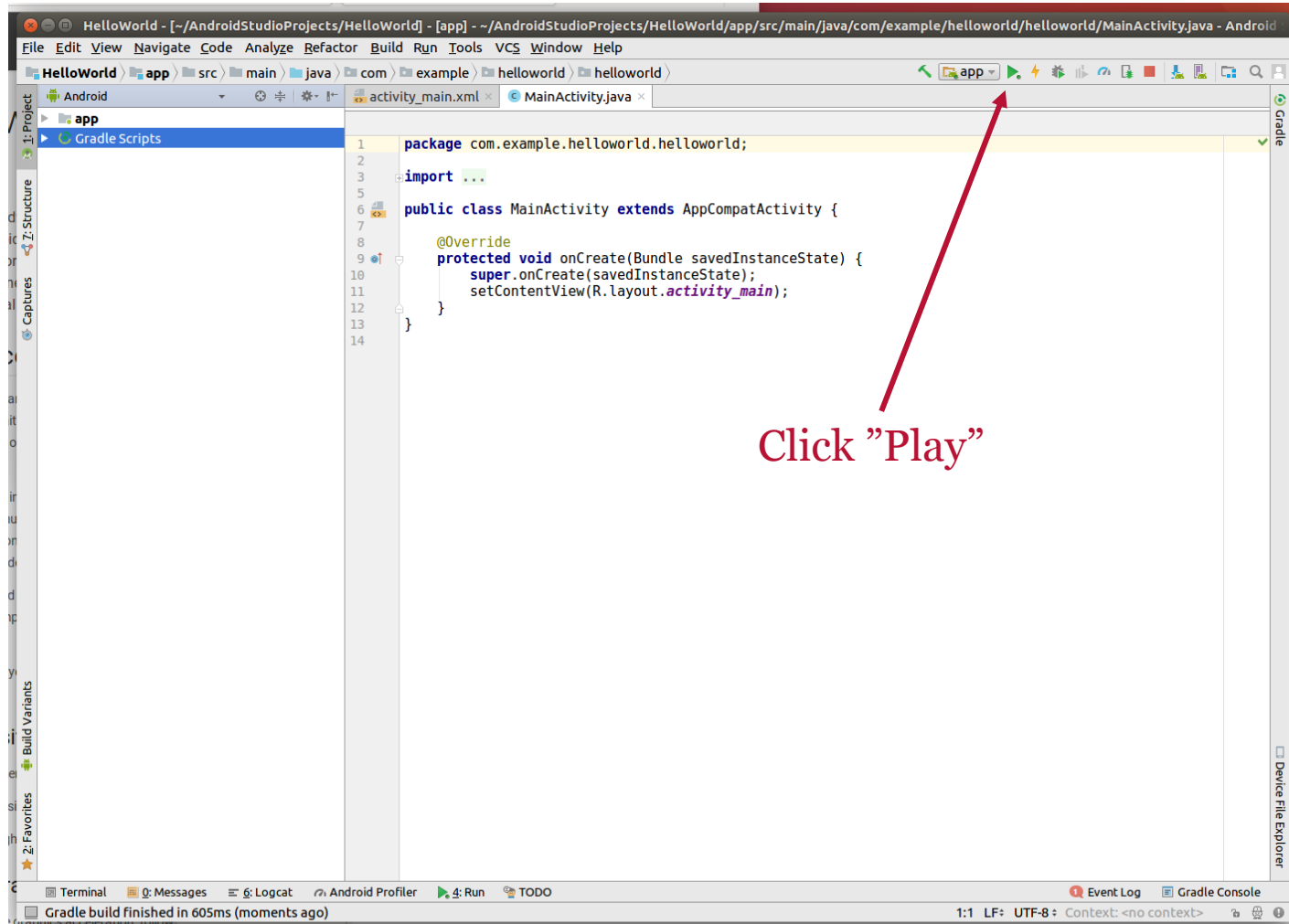
Errors might appear here, just click and follow instructions.

```
1 package com.example.helloworld.helloworld;
2
3 import ...
4
5 public class MainActivity extends AppCompatActivity {
6
7     @Override
8     protected void onCreate(Bundle savedInstanceState) {
9         super.onCreate(savedInstanceState);
10        setContentView(R.layout.activity_main);
11    }
12 }
13
14 }
```

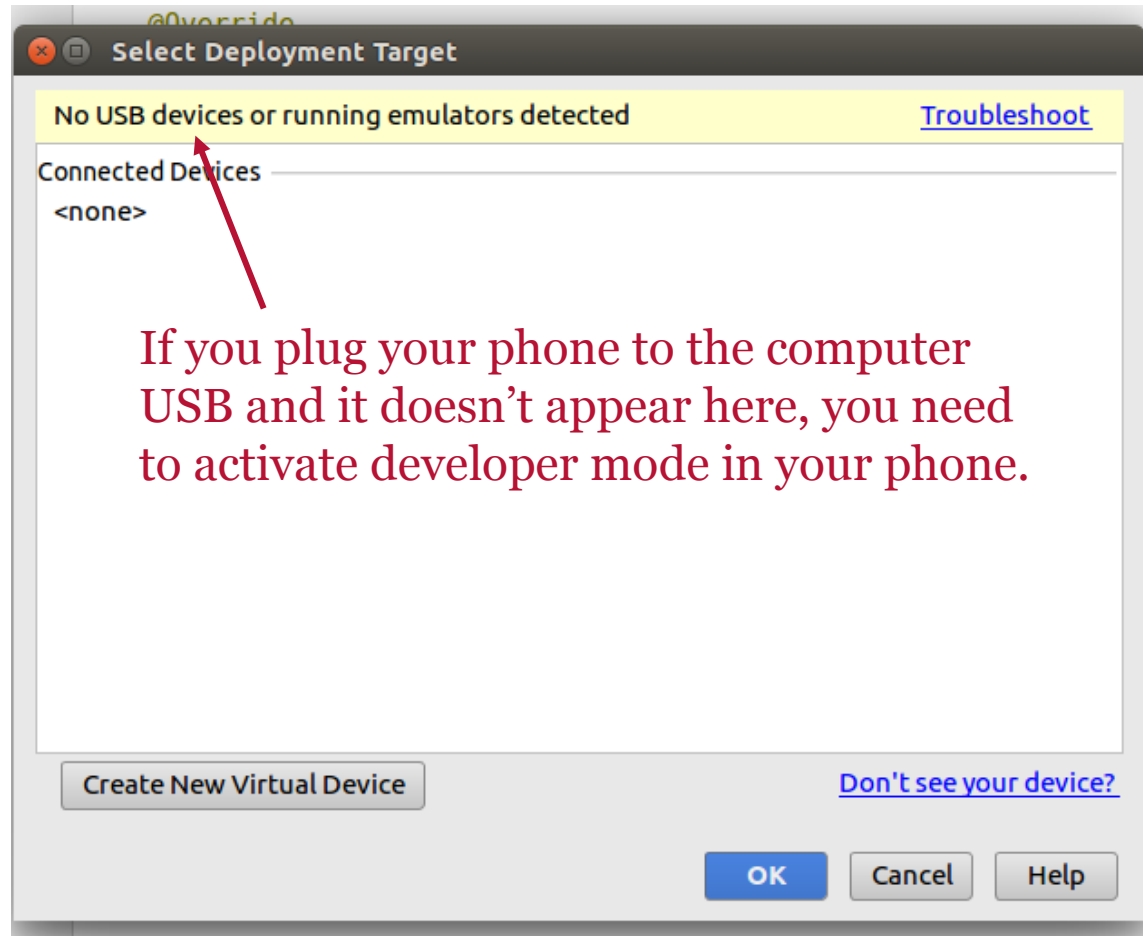
Gradle: 'HelloWorld' project refresh failed  
Error: Failed to find Build Tools revision 26.0.2  
[Install Build Tools 26.0.2 and sync project](#)

Gradle sync failed: Failed to find Build Tools revision 26.0.2 /// Consult IDE log for more details (Help | Show Log) (568ms)

# Running app



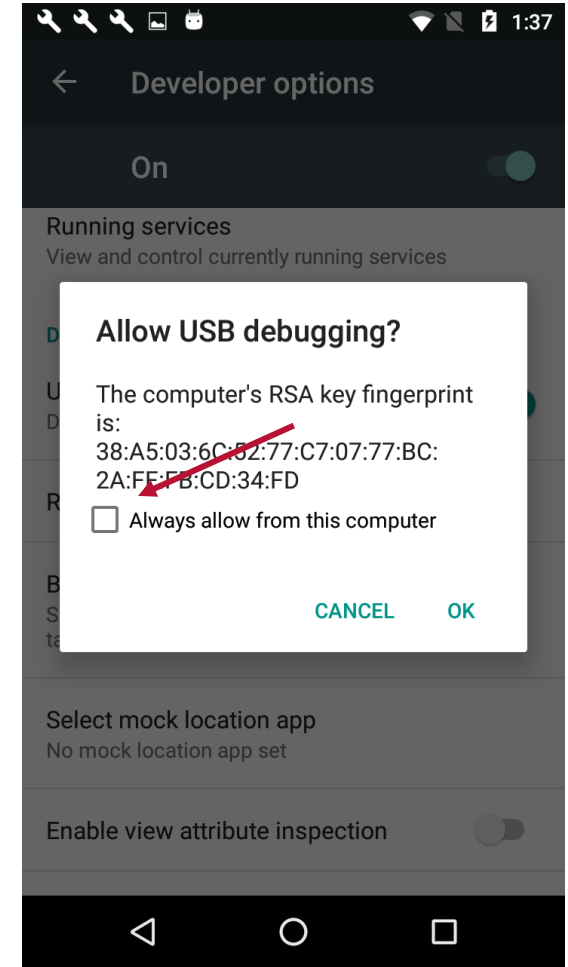
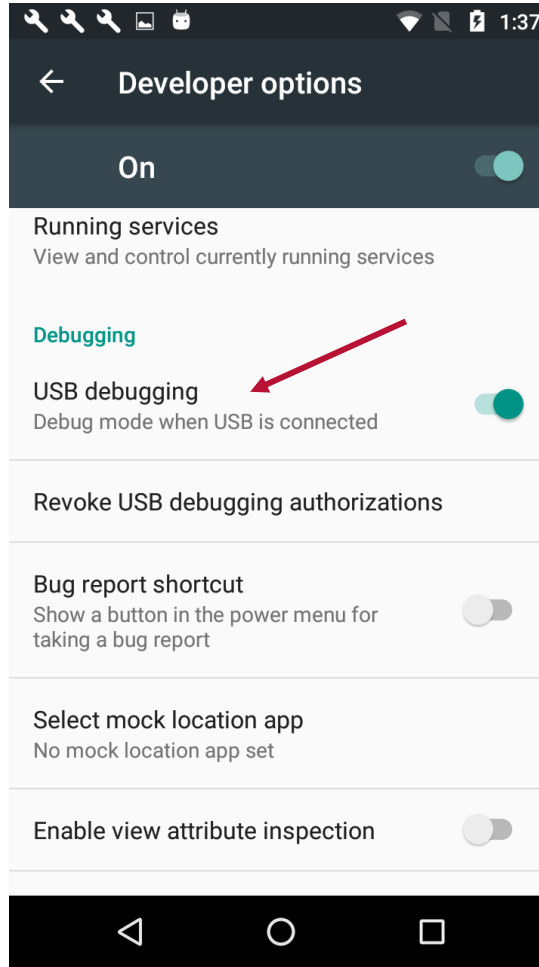
# Running app on device



# Activating developer mode

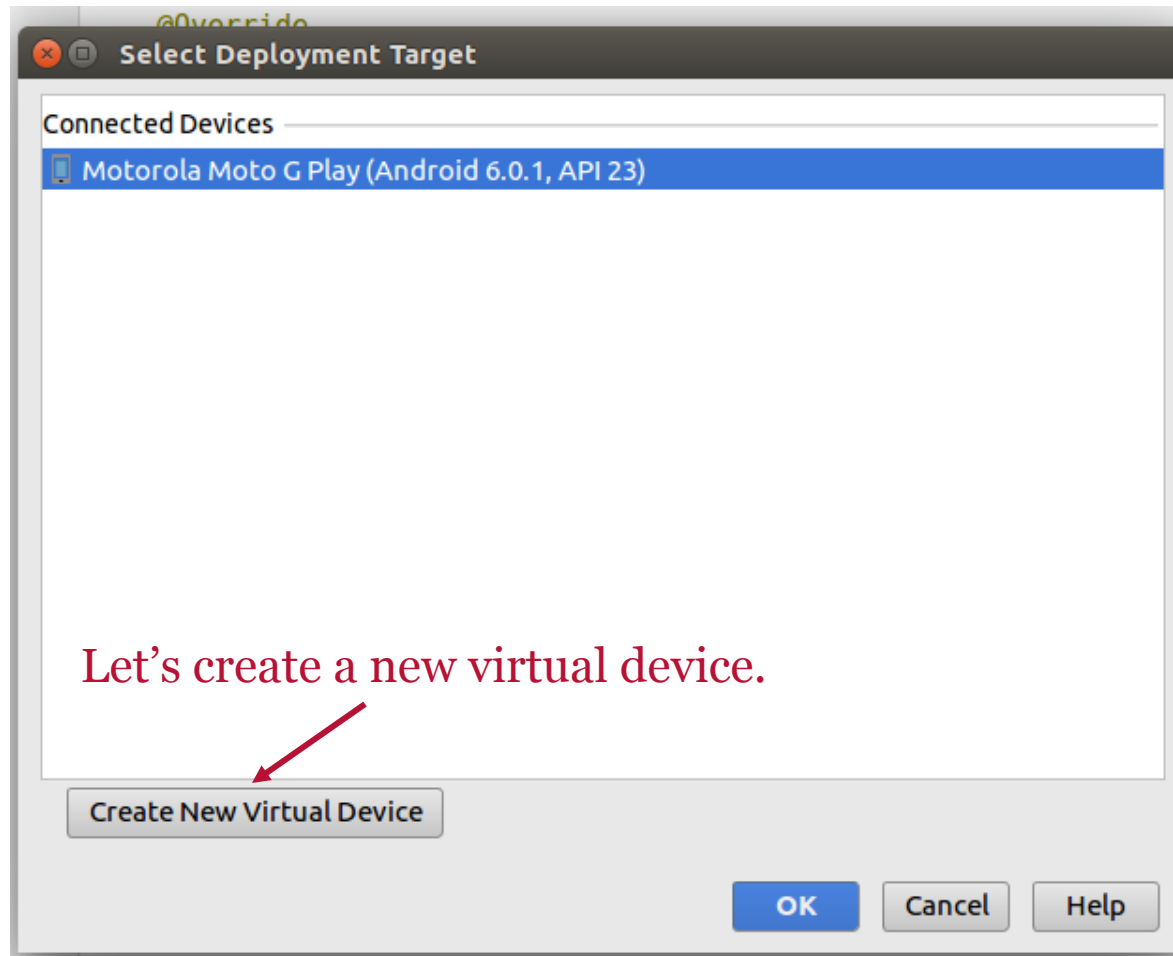
- Make sure it's a DATA USB cable (not charge-only).
- Unplug phone from USB.
- On the phone, go to the settings menu, and scroll down to "About phone." Tap it.
- Scroll down to the bottom again, where you see "Build number."
- Tap it seven (7) times.
- Look for "Developer options" on the settings menu.
- Switch on "USB debugging".
- Plug it back to the USB.
- Allow USB debugging (check always allow).

# Activating developer mode

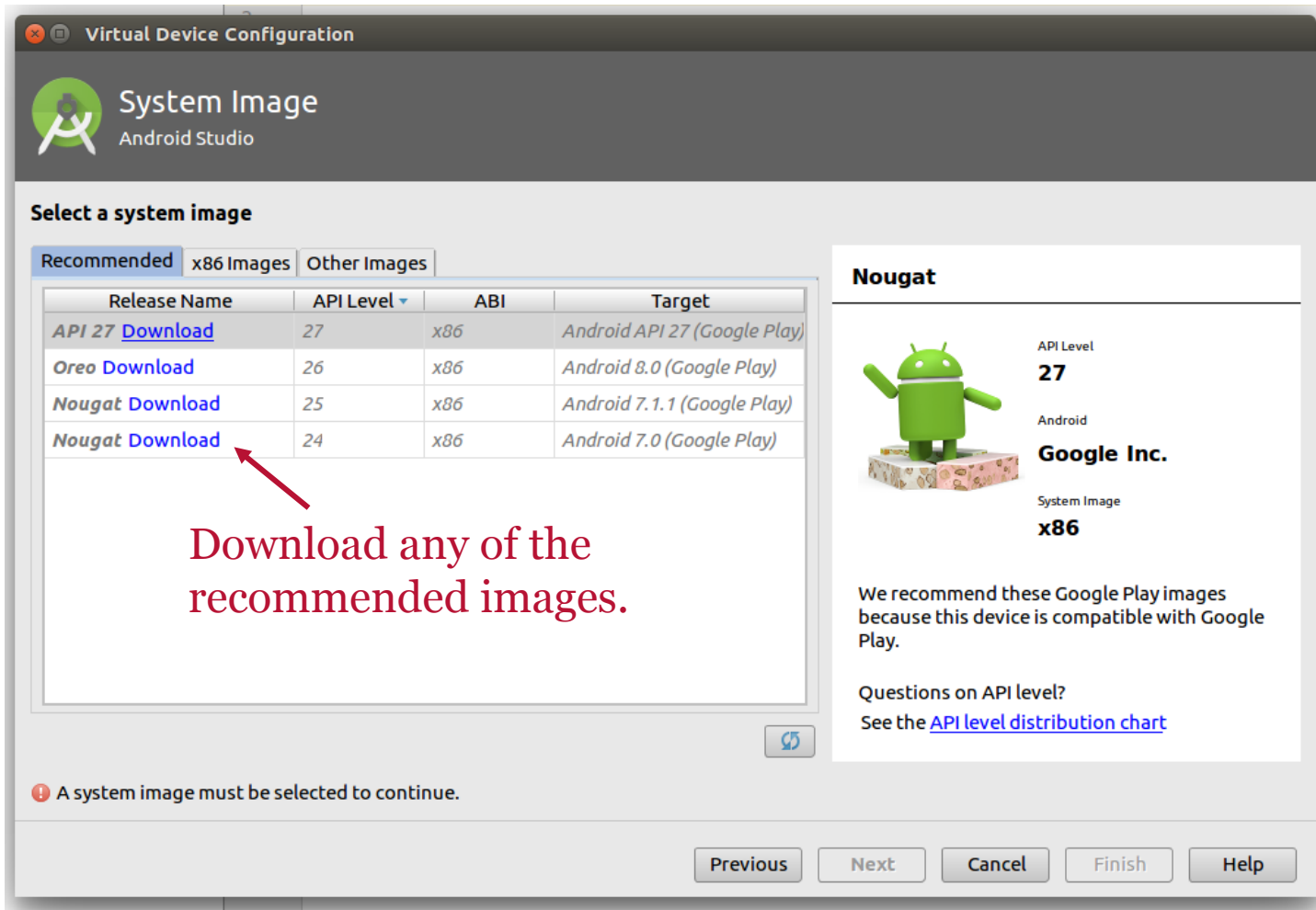




# Running app on emulator



# Create virtual device



Virtual Device Configuration

System Image  
Android Studio


Select a system image

Recommended x86 Images Other Images

Release Name	API Level	ABI	Target
API 27 <a href="#">Download</a>	27	x86	Android API 27 (Google Play)
Oreo <a href="#">Download</a>	26	x86	Android 8.0 (Google Play)
Nougat <a href="#">Download</a>	25	x86	Android 7.1.1 (Google Play)
Nougat <a href="#">Download</a>	24	x86	Android 7.0 (Google Play)

Download any of the recommended images.

**Nougat**



API Level  
**27**

Android  
**Google Inc.**

System Image  
**x86**

We recommend these Google Play images because this device is compatible with Google Play.

Questions on API level?  
See the [API level distribution chart](#)

! A system image must be selected to continue.

Previous Next Cancel Finish Help

# Select system image

Virtual Device Configuration


System Image  
Android Studio

Select a system image

Recommended x86 Images Other Images

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**Nougat**



API Level  
**27**

Android  
**Google Inc.**

System Image  
**x86**

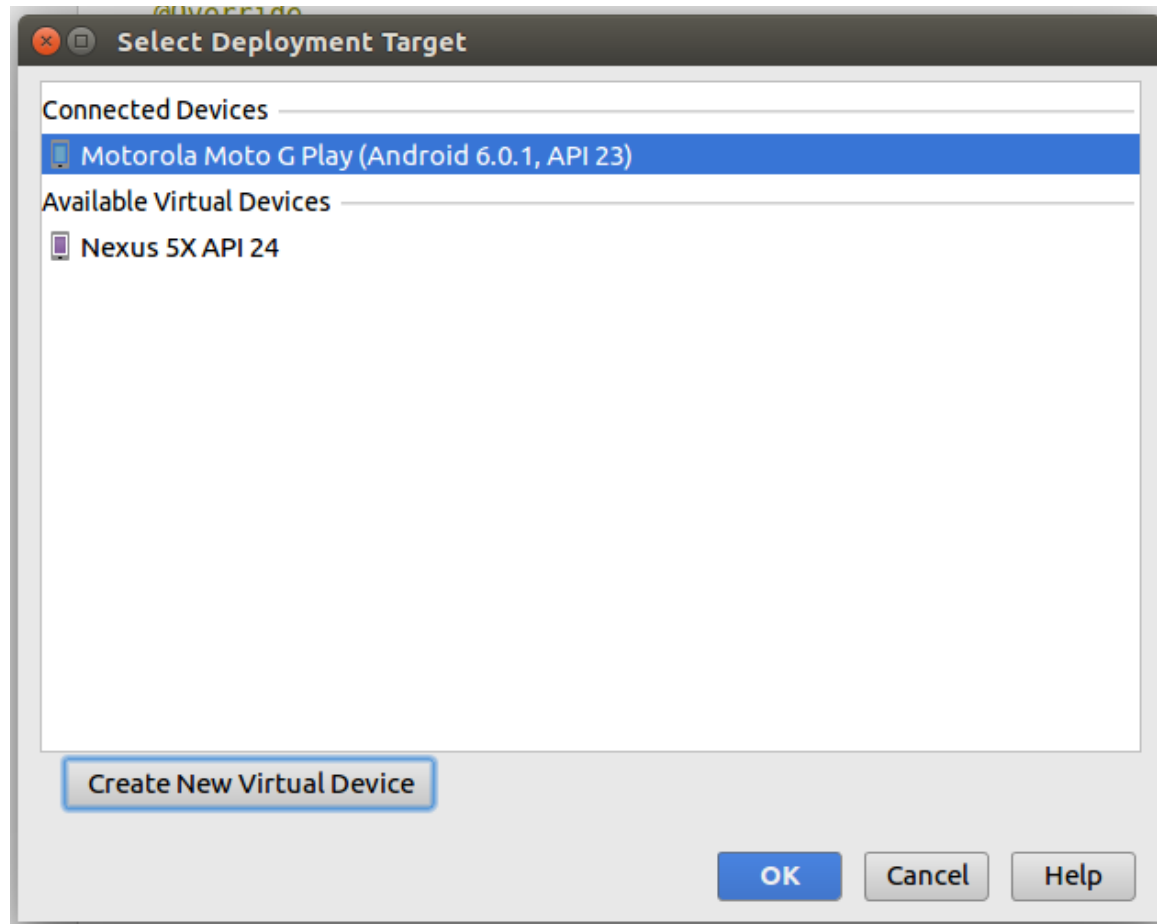
We recommend these Google Play images because this device is compatible with Google Play.

Questions on API level?  
See the [API level distribution chart](#)

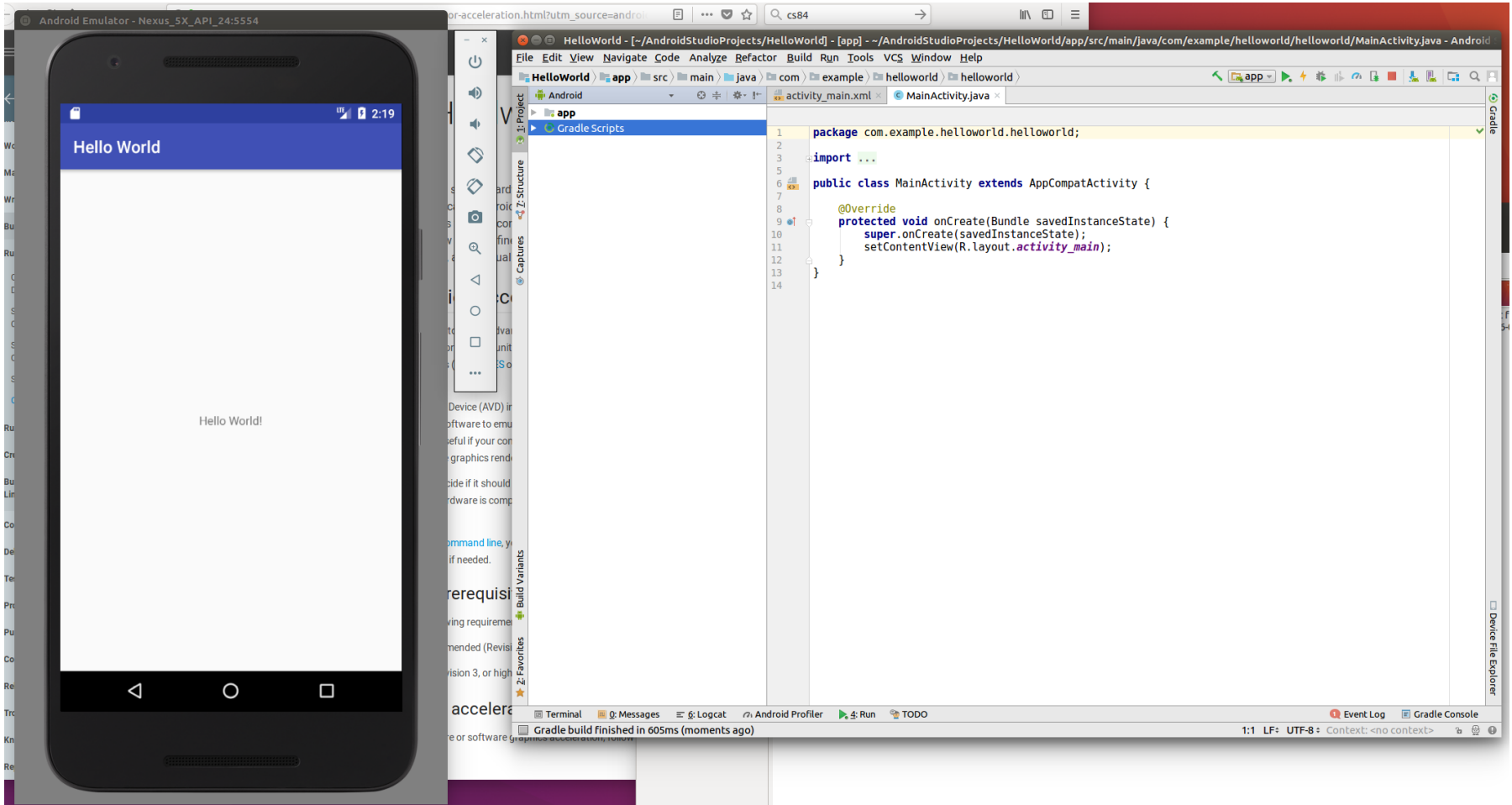
! A system image must be selected to continue.

Previous Next Cancel Finish Help

# Select device to run app



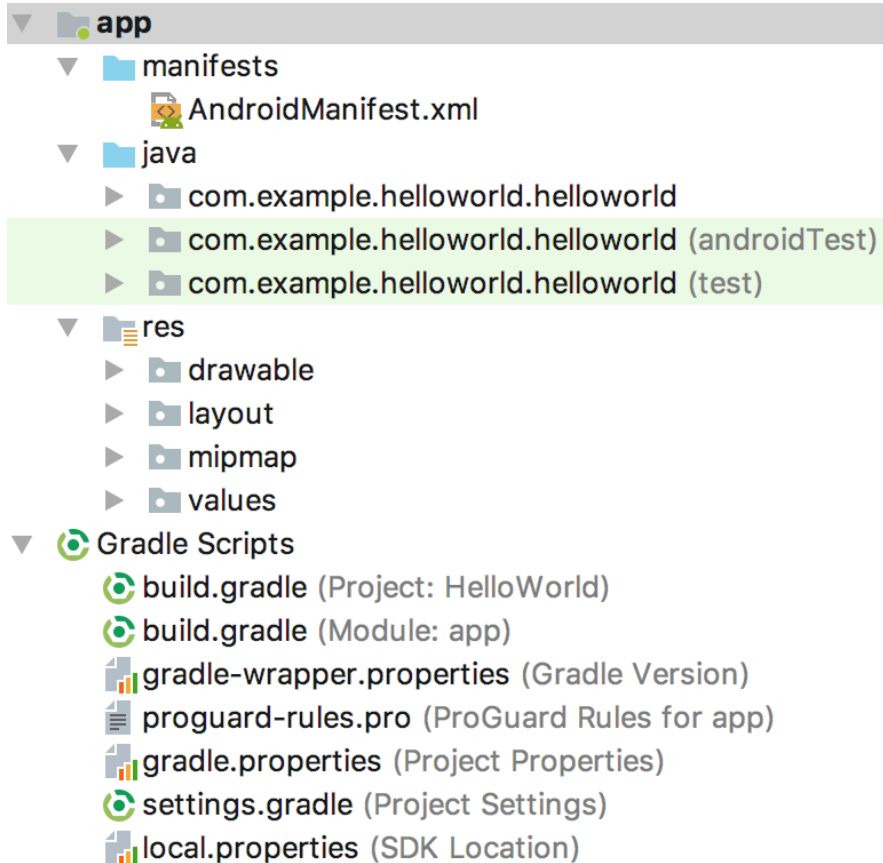
# App running on emulator



# Android API Levels

- Be careful to work at least with the API level of your device
- 21 – Android 5.0 (Lollipop)
- 22 – Android 5.1 (Lollipop)
- 23 – Android 6.0 (Marshmallow)
- 24 – Android 7.0 (Nougat)
- 25 – Android 7.1/7.1.1 (Nougat)
- 26 – Android 8.0 (Oreo)
- 27 – Android 8.1 (Oreo)
- <https://developer.android.com/guide/topics/manifest/uses-sdk-element.html>

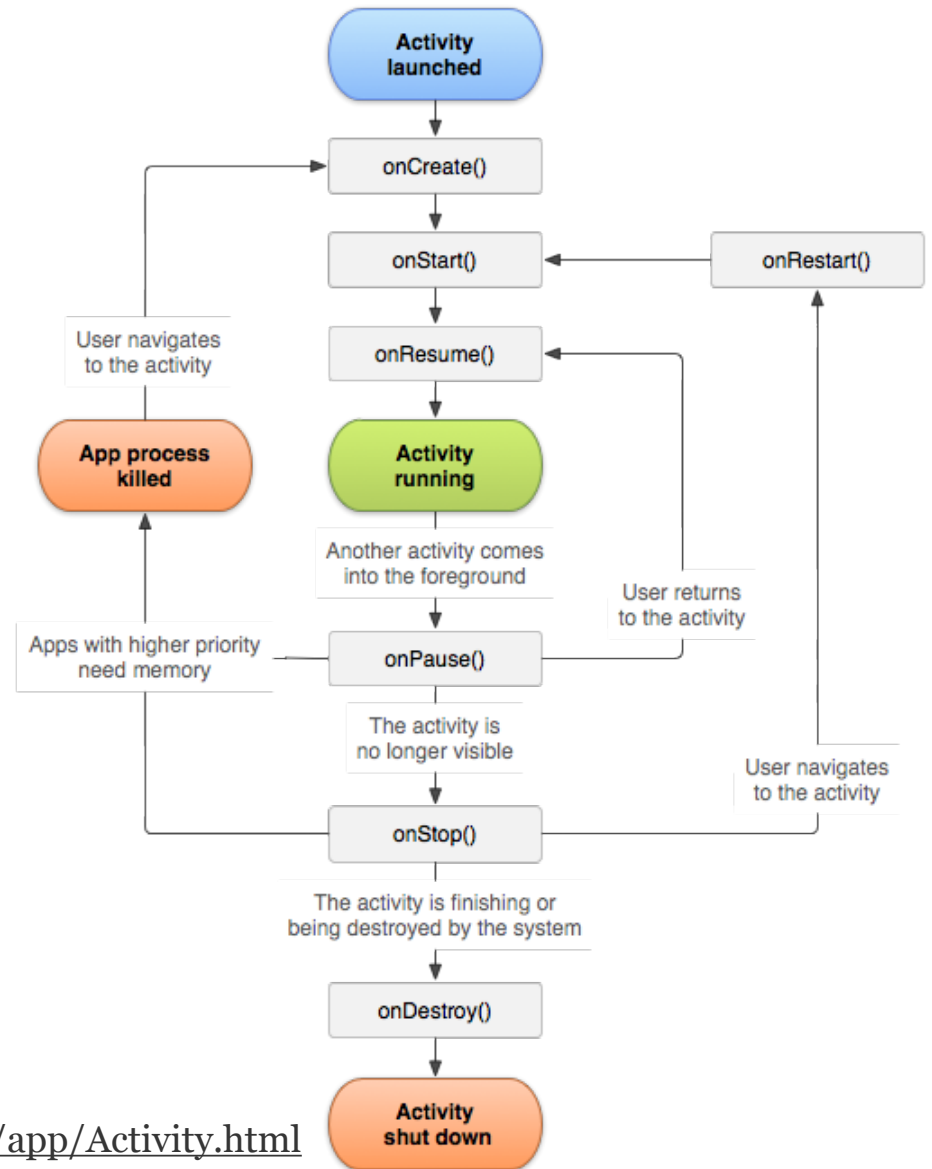
# Project structure and files



- **AndroidManifest.xml**
  - general app configurations
- **java folder: source code**
  - production code
  - unit tests (test)
  - instrumental tests (androidTest)
- **res folder: resources**
  - drawable: images (bitmap or vector)
  - layout: views (screens) xml files
  - mipmap: launcher icons in different resolutions (bitmap or vector)
  - values: other constant resources (internationalization strings, color themes, styles, etc)
- **Gradle scripts**
  - project scope: all modules - commons (put build and deploy stuff here)
  - module scope: different deployment environments (put dependencies here)

# Activity Lifecycle

- Activity active (running)
  - Visible and can interact with user
- Activity paused
  - Partially visible, no interaction
- Activity stopped
  - Not visible, still on memory
- Activity destroyed
  - Process killed

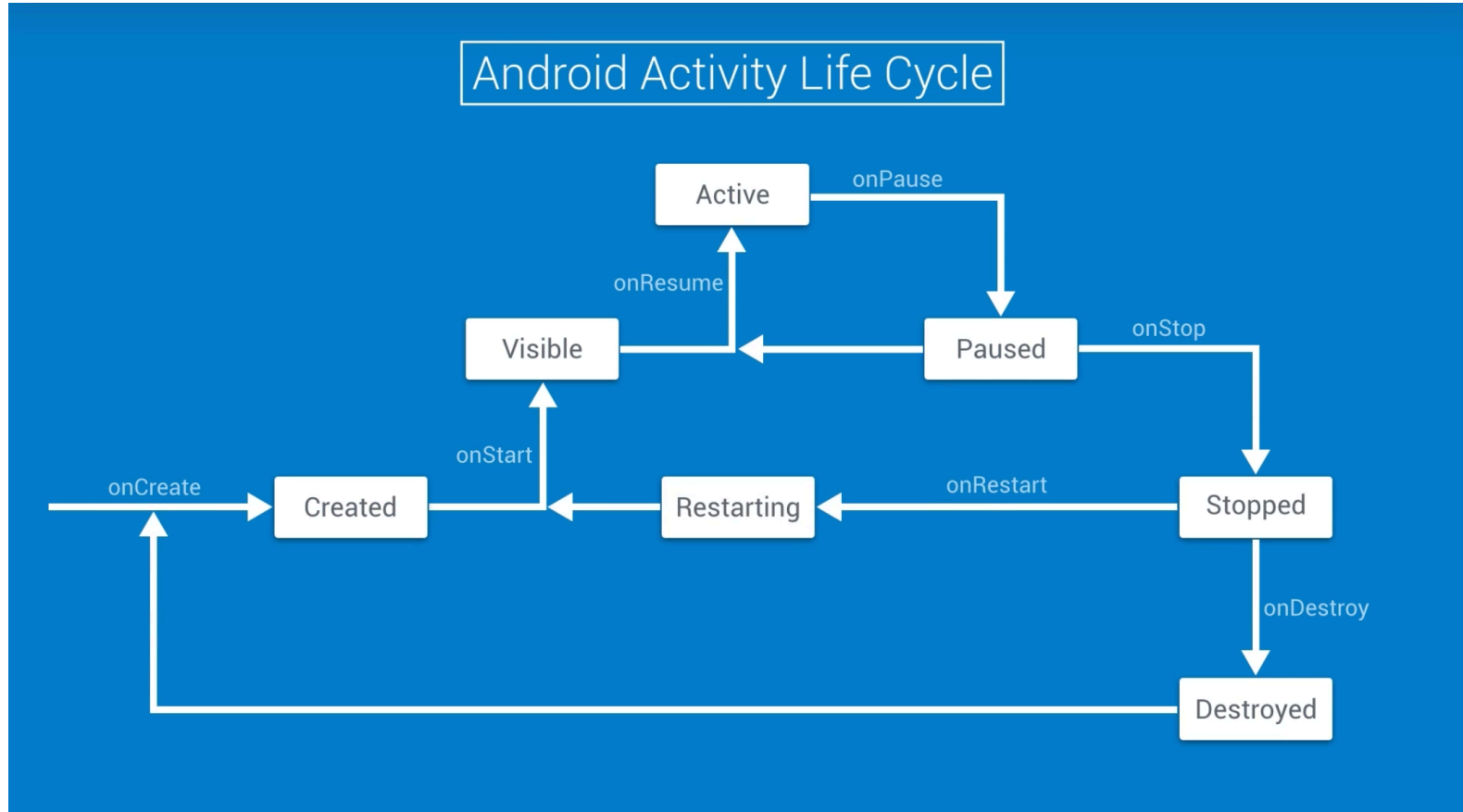


\* <https://developer.android.com/reference/android/app/Activity.html>





# Activity Lifecycle



\* <https://youtu.be/LFTYZrYARUw>

# Useful links

- Main Android developer website
  - <https://developer.android.com/>
- Tutorials and training:
  - Google tutorials (text): <https://developer.android.com/training/index.html>
  - Google official courses on Udacity (videos): <https://www.udacity.com/google>
  - Recommended Android Basics: <https://www.udacity.com/course/android-basics-nanodegree-by-google--nd803>
- Reference
  - APIs Reference: <https://developer.android.com/reference>
  - Material design: <https://material.io>
  - Colors: <https://material.io/guidelines/style/color.html>
  - Fonts: <https://material.io/guidelines/style/typography.html>