# Tutorial 1.

## Use of Android Studio


2022-2023

COMP3330 Interactive Mobile Application Design and Programming

Dr. T.W. Chim (E-mail: twchim@cs.hku.hk)

Department of Computer Science, The University of Hong Kong

# Using your own computer

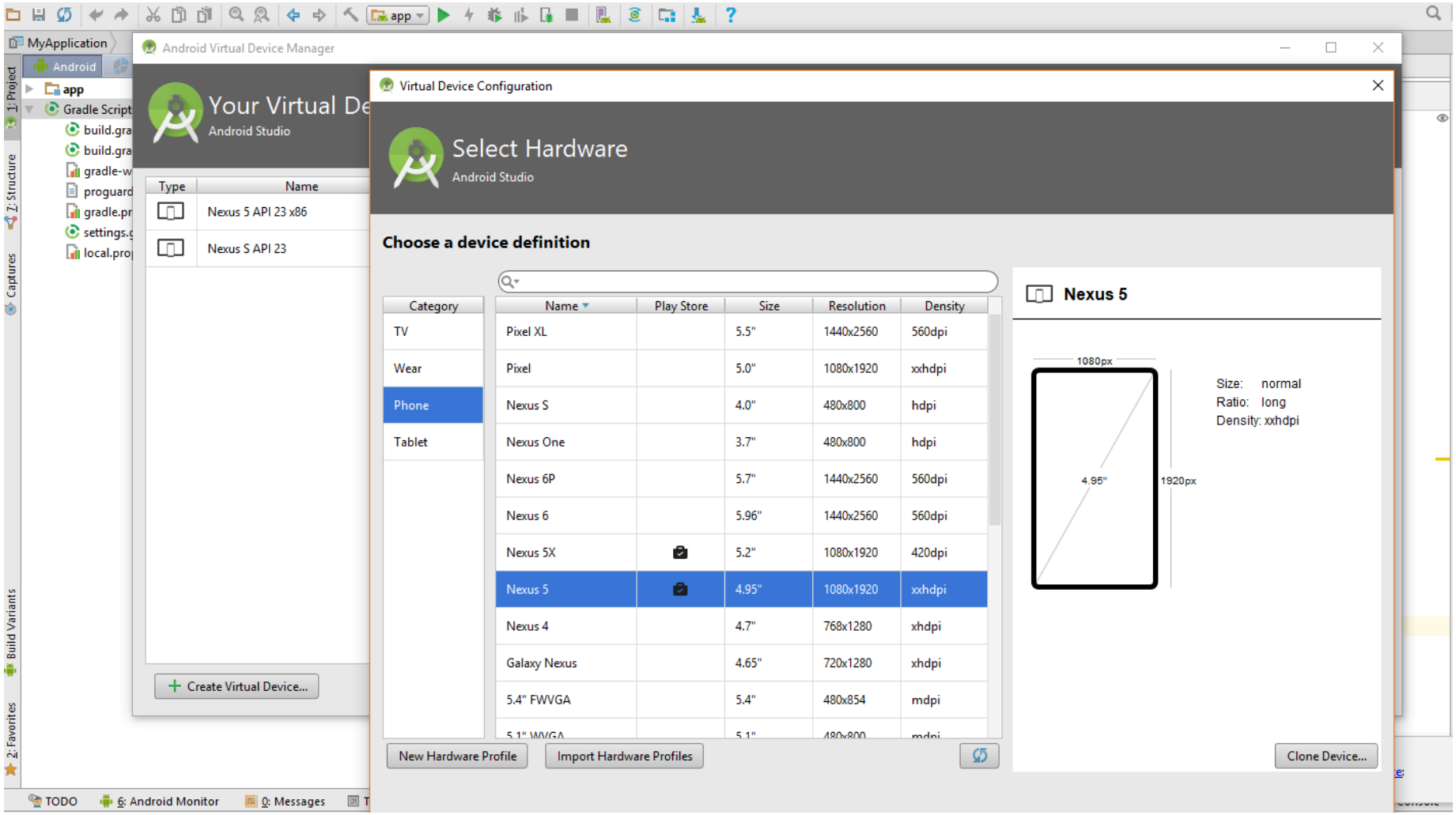
# Installation of Software

- Google provides an ALL-IN-ONE developer tool, Android Studio, which consists of:
  - Android SDK Tools
  - Android Platform-tools
  - The latest Android platform
  - The latest Android system image for the emulator: https://developer.android.com/studio/index.html

# Creating Android Virtual Device

- An Android Virtual Device (AVD) is a configuration that defines the characteristics of an Android phone, tablet, Android Wear, or Android TV device that you want to simulate in the Android Emulator.
- The AVD Manager is an interface you can launch from Android Studio that helps you create and manage AVDs.
- To open the AVD Manager, you can either:
  - Select Tools > Android > AVD Manager, or
  - Click AVD Manager icon in the toolbar.

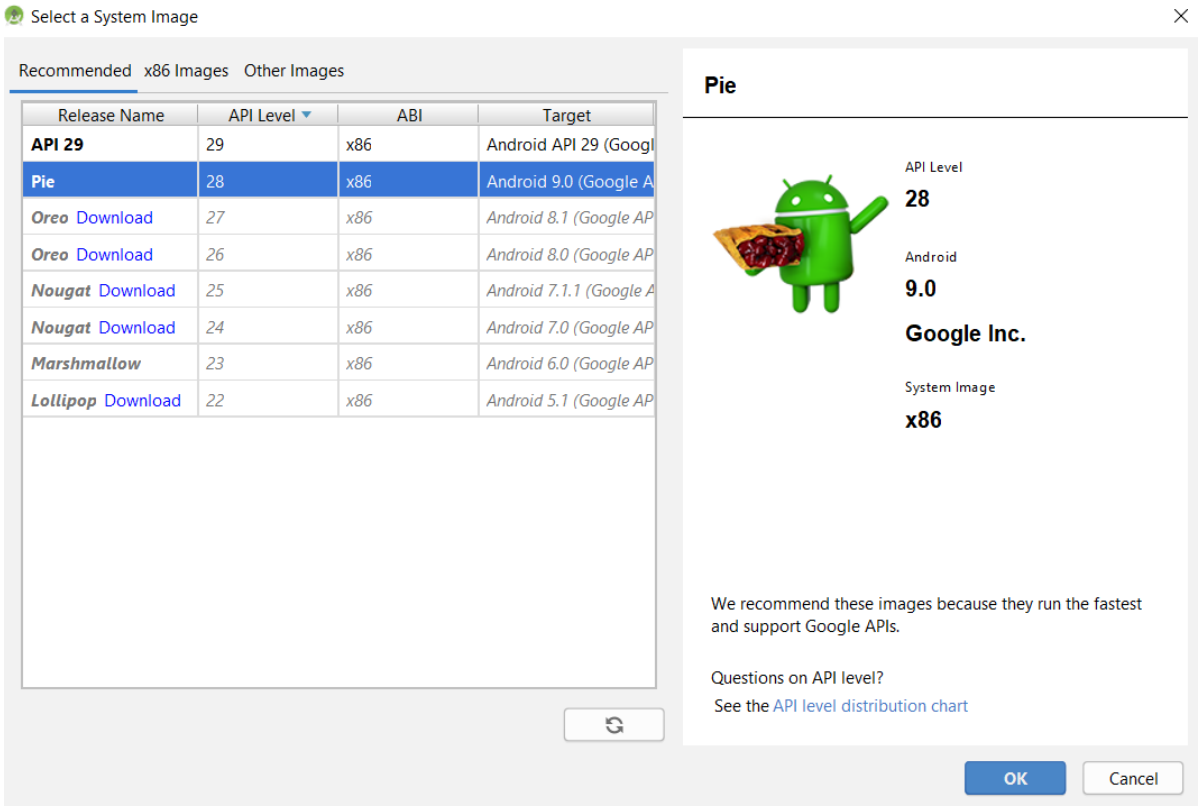
# Creating Android Virtual Device




**Note: Different virtual devices have different CPU and memory requirements on your computer.**

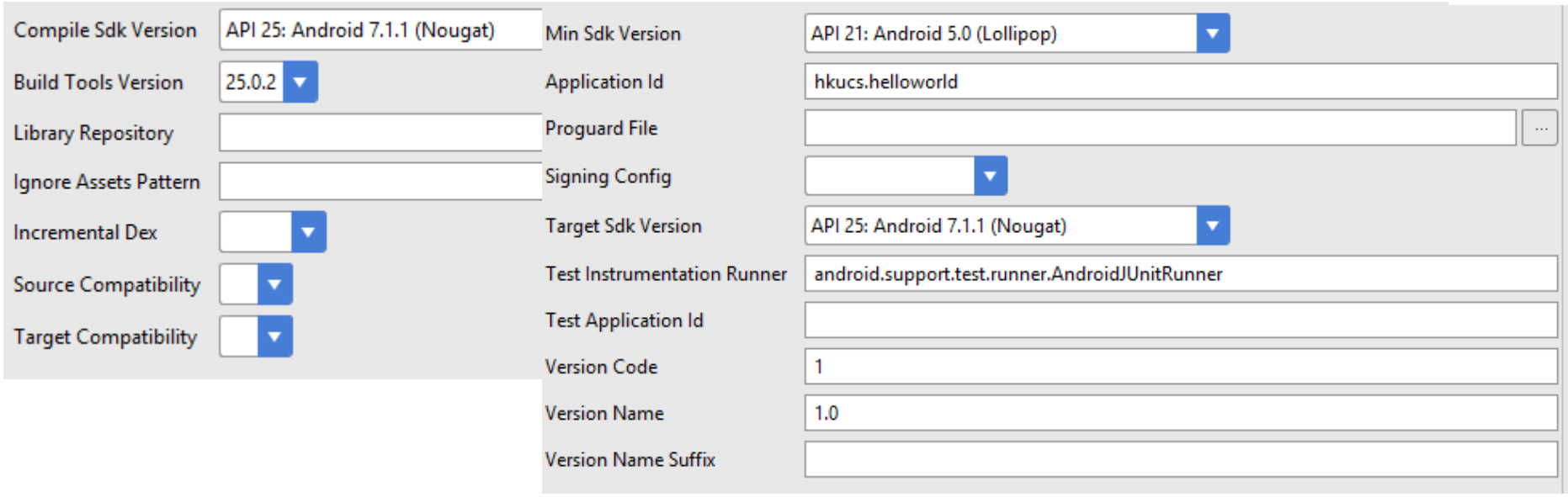
# Installation of proper Android SDK

- You may need to install SDK for different platforms (especially when you want to open existing projects from others).
- To open the SDK Manager, you can select Tools > Android > SDK Manager.
- You are recommended to install API Level 29 for this course.



# Configuration of Modules

- Right-click “app” and choose “Open Module Settings”. There are some important items.
  - “Properties → Compile Sdk Version”: That version of Sdk is used for the compilation.
  - “Properties → Build Tools Version”: That version of build tools are used for building the APK
  - “Default Config → Min Sdk Version”: Your user needs that Sdk version or above to install and run your app.
  - “Default Config → Target Sdk Version”: Your app is targeted at that Sdk version and if the user is using that Sdk version, the performance will be optimal.



# Location of APK

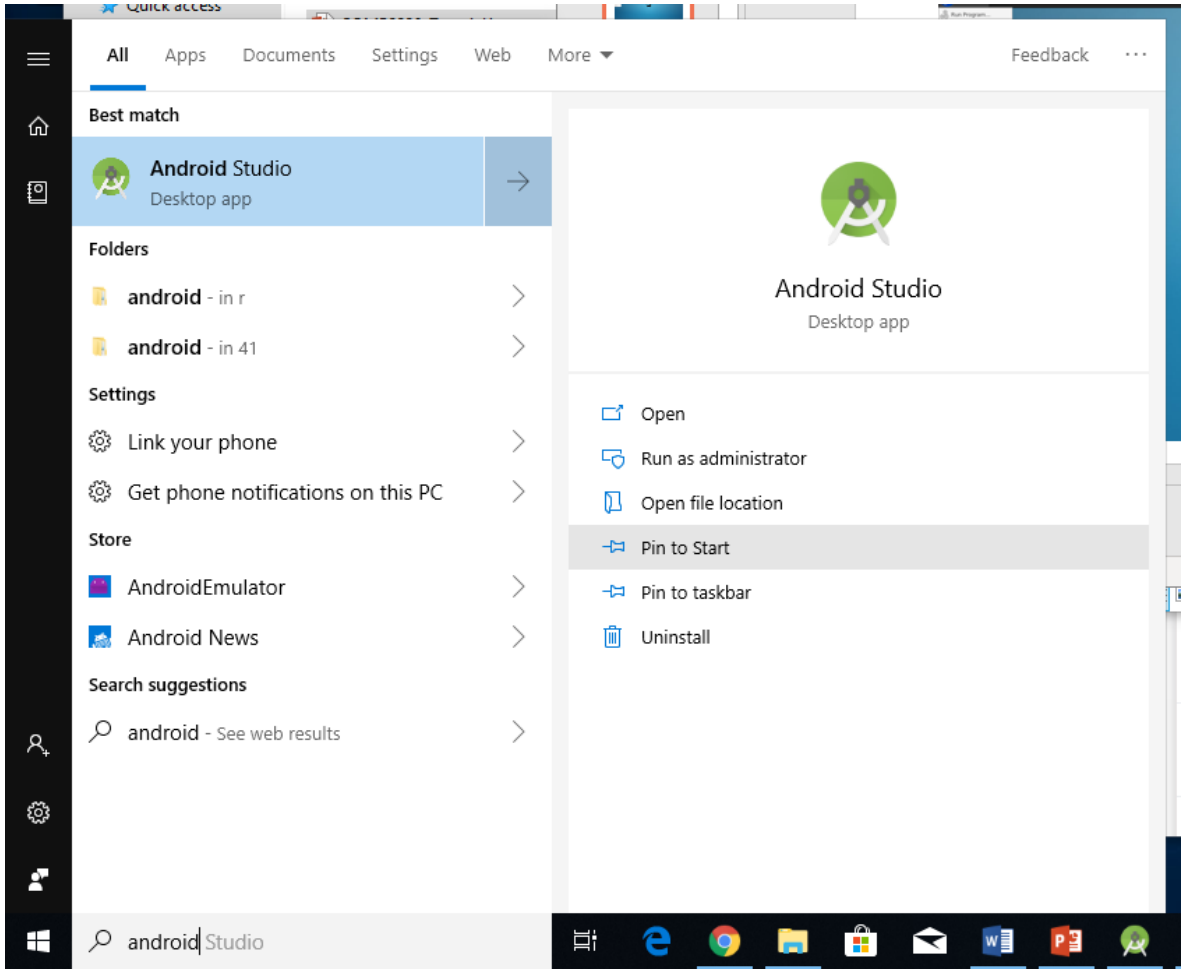
- Android system can recognize signed APK files by default. On the Android phone, you can click onto any signed APK file and start the installation.
- To test your app on real Android phone, you can connect your phone with your computer via USB cable. When you run your app, in addition of emulators, you should see your real Android phone as a target.
- Note: You may need to turn on the “Developer options” on your Android phone before it can run your app. For example, users of Samsung phone need to follow the steps below to turn on the “Developer options”.

  https://www.samsung.com/uk/support/mobile-devices/how-do-i-turn-on-the-developer-options-menu-on-my-samsung-galaxy-device/

# Starting Android Studio

# Starting Android Studio

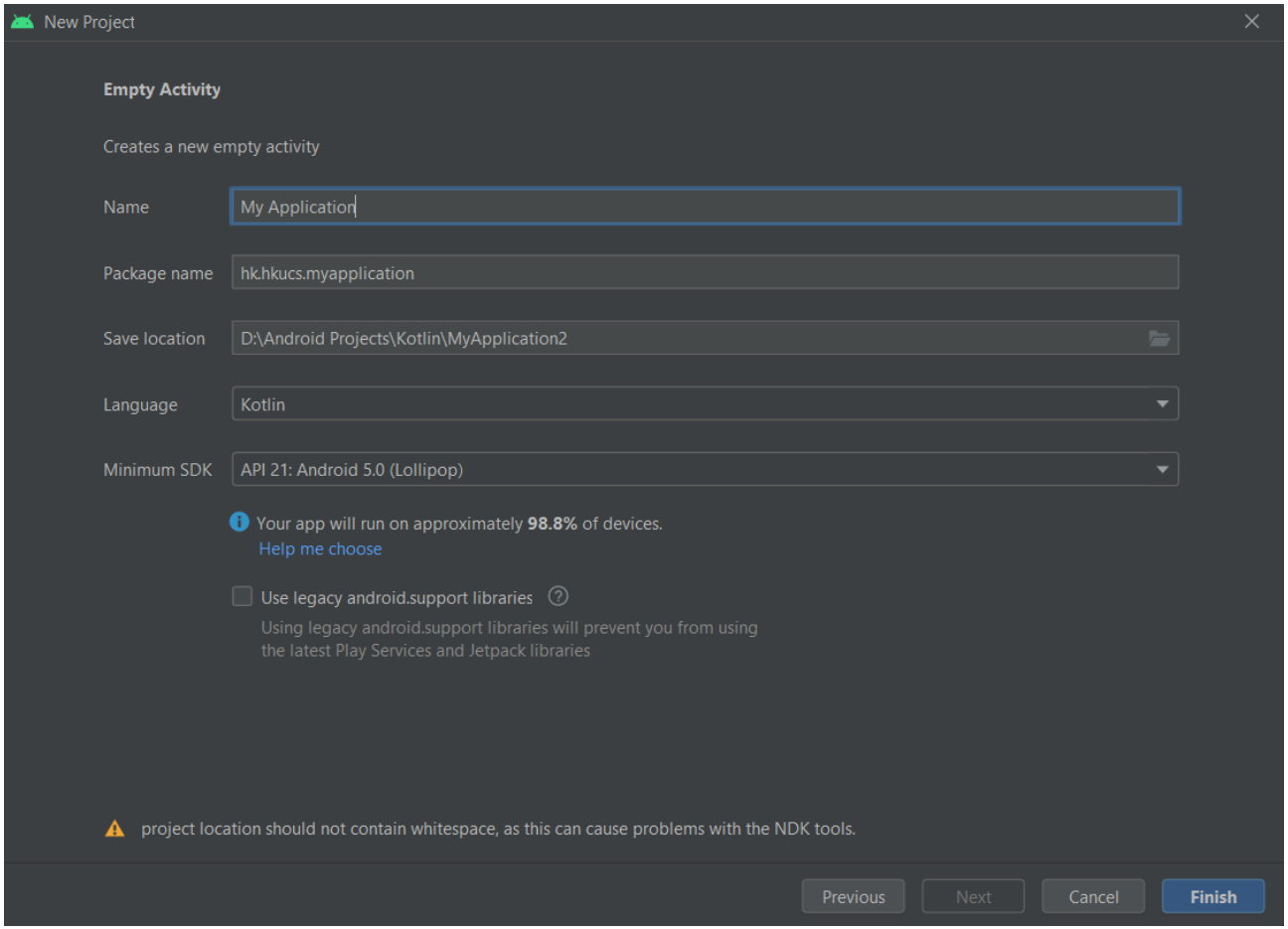
- Launch “Android Studio”



# Creating a new project

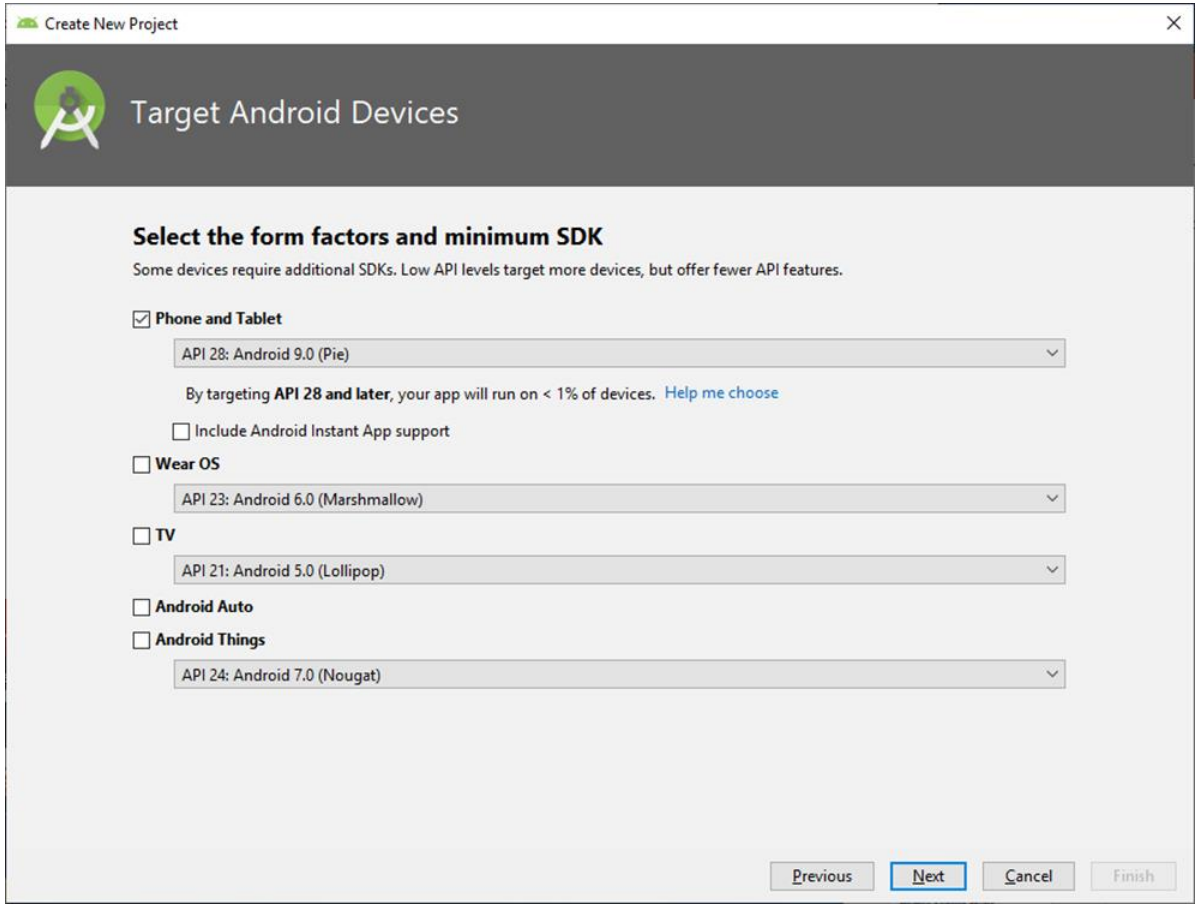
# Start a new Android Studio project

- Type the Application name, then Click “Next”



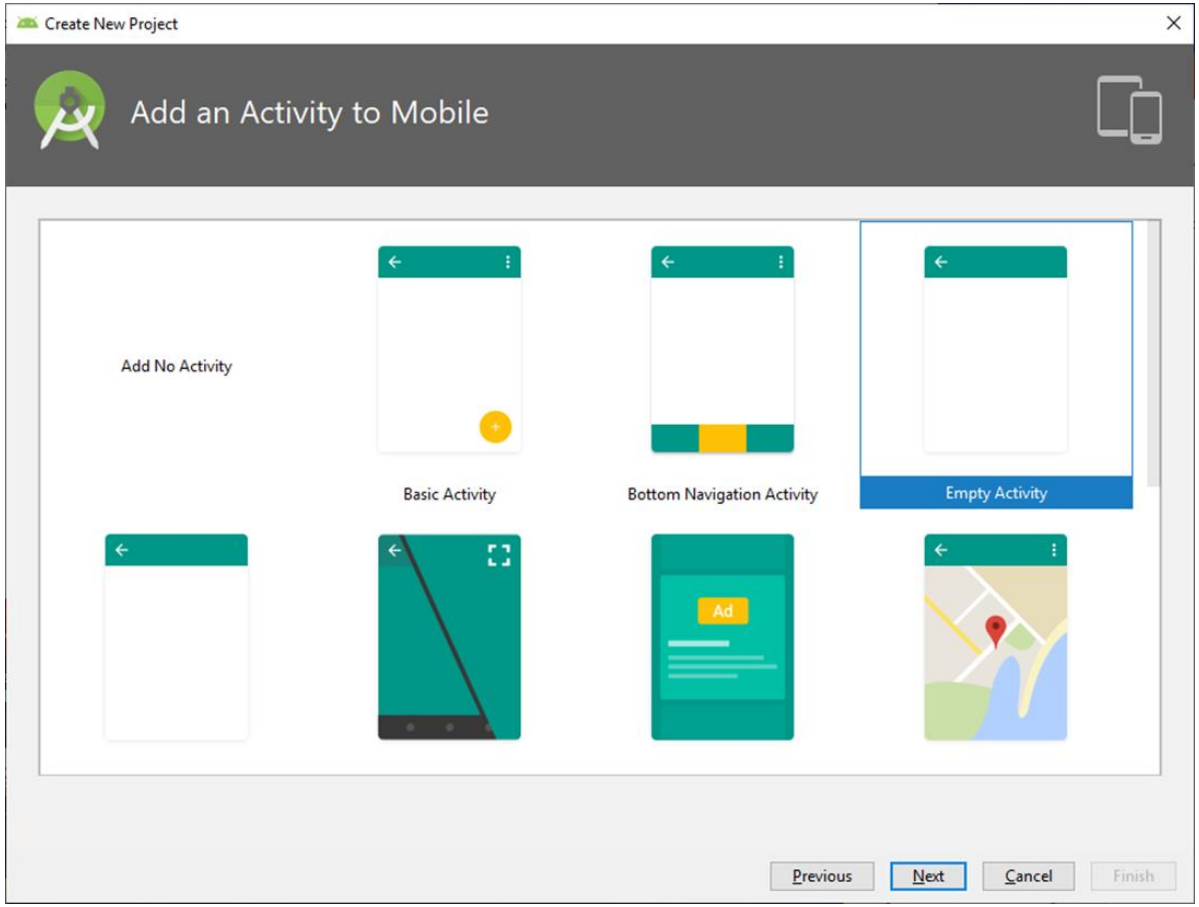
# Start a new Android Studio project

- Select “API 28” as minimum SDK



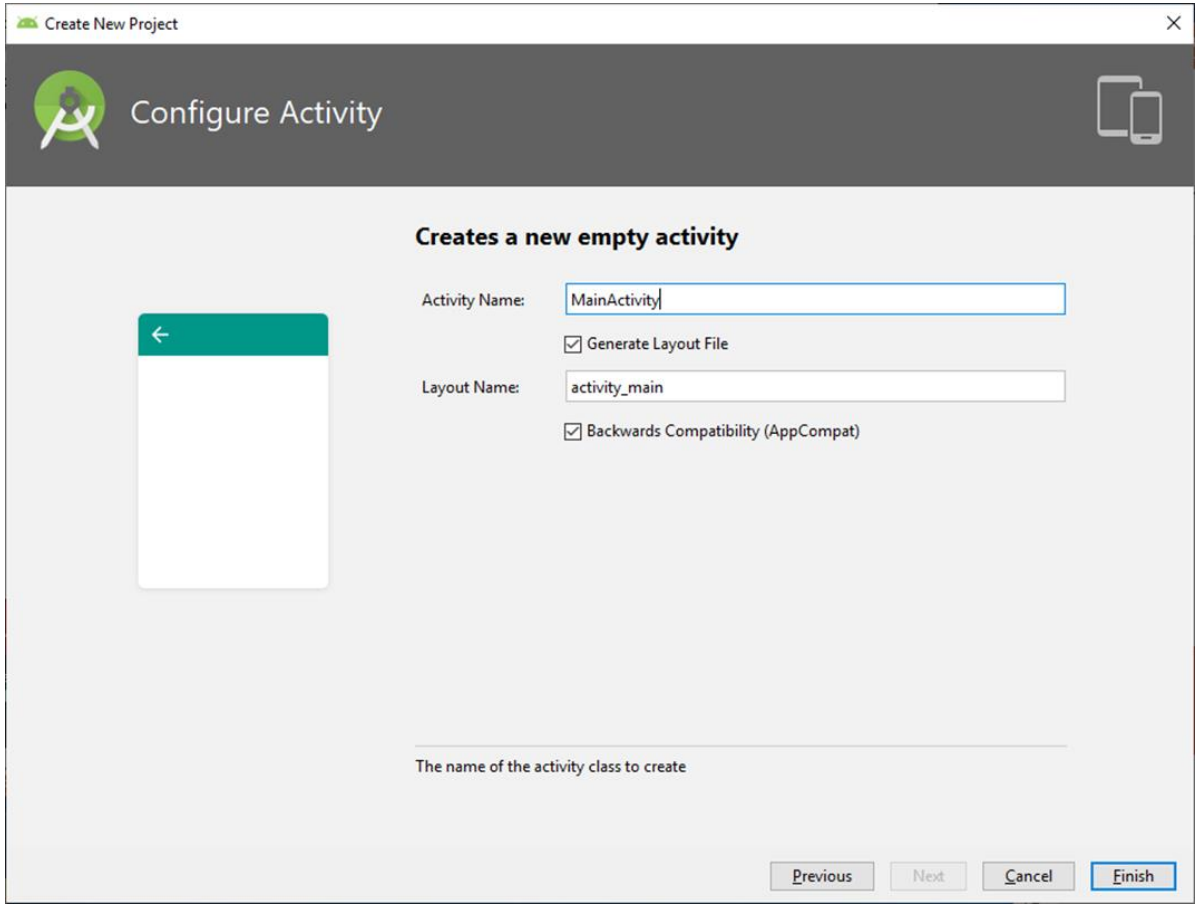
# Start a new Android Studio project

- Select “Empty Activity”



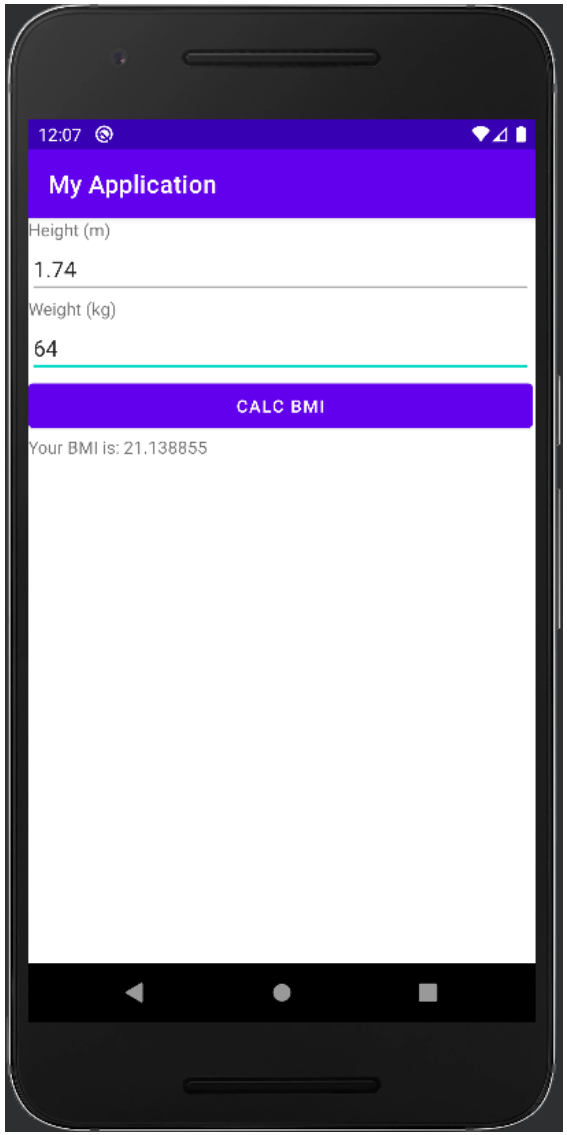
# Start a new Android Studio project

- Click “Finish”



# Building a BMI calculator

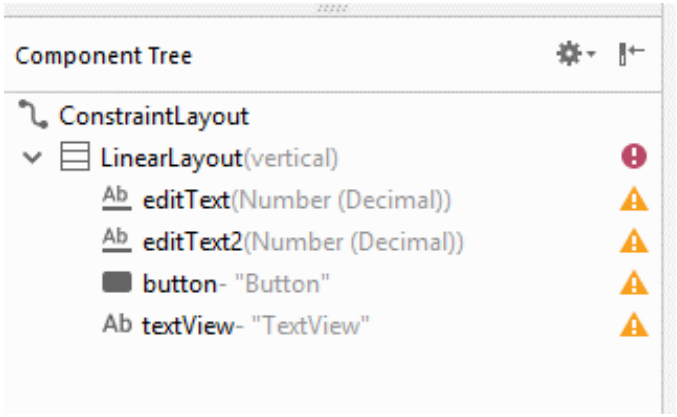
# Definition of BMI

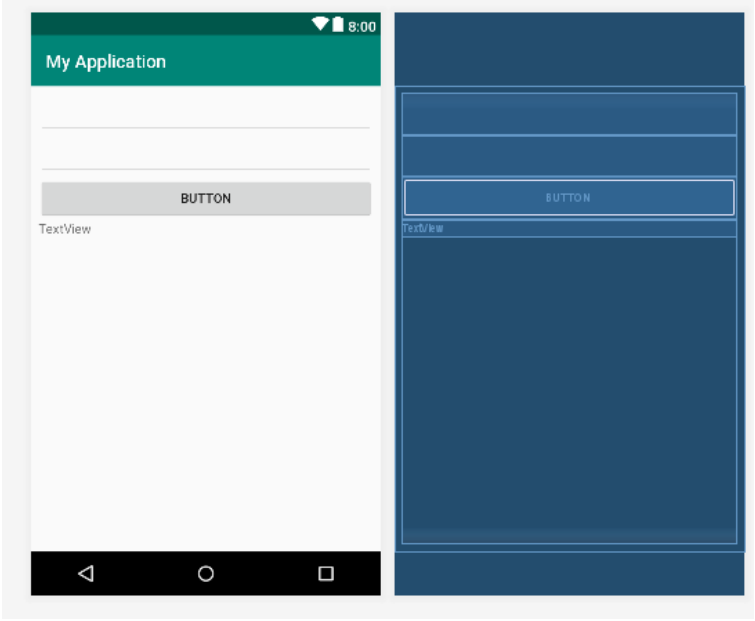



$$BMI = \frac{weight\ (kg)}{[Height\ (m)]^2}$$

# In activity_main.xml

- Drag a LinearLayout (vertical) into the screen
- Drag 2 editTexts (Decimal), 1 button and 1 textView into the LinearLayout



# In MainActivity.java

- Declare variables for UI components

```
class MainActivity : AppCompatActivity() {
    private var height: EditText? = null
    private var weight: EditText? = null
    private var result: TextView? = null
```

- Initialize them in OnCreate()

```
override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        height = findViewById<EditText>(R.id.editText)
        weight = findViewById<EditText>(R.id.editText2)
        result = findViewById<TextView>(R.id.textView)
    }
```

# In MainActivity.java

- Implement the function for calculating BMI

```
fun calc(v: View?) {
        val h = height!!.text.toString().toFloat()
        val w = weight!!.text.toString().toFloat()
        val bmi = w / h / h
        result!!.text = "Your BMI is: $bmi"
    }
```

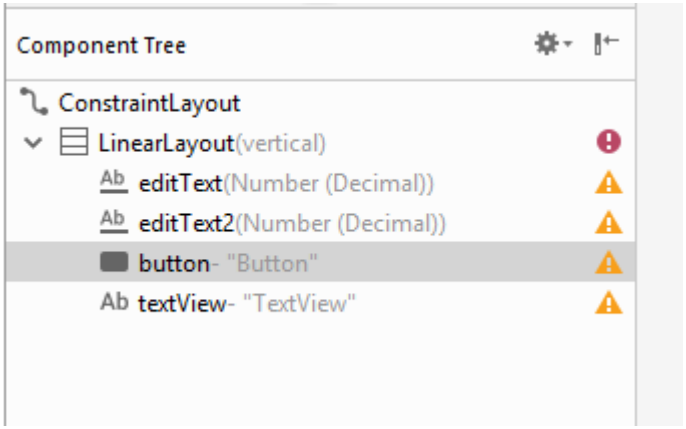
# In MainActivity.java

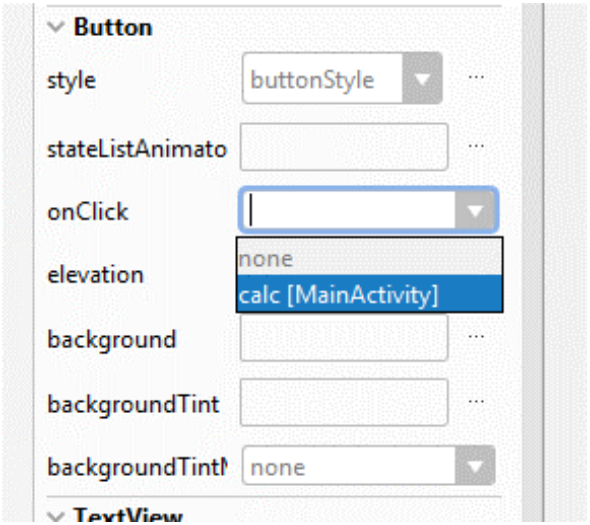
activity_main.xml | MainActivity.kt

```kotlin
package hk.hkucs.myapplication

import androidx.appcompat.app.AppCompatActivity
import android.widget.EditText
import android.widget.TextView
import android.os.Bundle
import android.view.View

class MainActivity : AppCompatActivity() {
    private var height: EditText? = null
    private var weight: EditText? = null
    private var result: TextView? = null
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        height = findViewById<EditText>(R.id.editText)
        weight = findViewById<EditText>(R.id.editText2)
        result = findViewById<TextView>(R.id.textView)
    }

    fun calc(v: View?) {
        val h = height!!.text.toString().toFloat()
        val w = weight!!.text.toString().toFloat()
        val bmi = w / h / h
        result!!.text = "Your BMI is: $bmi"
    }
}
```

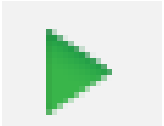
# Assign calc() to the button

- Select the button
- In attribute windows, onClick -> calc




- Done! Click “Run”



Oh… The user interface is not the same as the one on P.17. Modify “activity_main.xml” to enhance the user interface.

# Save and Submit Your Work

- Please save your work, issue “File → Export → Export to Zip File…” to zip the project and submit to Moodle by October 6, 2022 (Thursday) as a proof of tutorial participation.

# Seeking for help?

- In case you encounter any problems or errors in the installation and execution of Android Studio, you can talk to us.
- But since we also haven't encountered all kinds of problems or errors, you can post a message to the "Problems about Android Studio" forum on our Moodle page and describe your problems clearly. Your peer classmates who have encountered similar problems or errors before may help.

# Tutorial 1.

## End


2022-2023

COMP3330 Interactive Mobile Application Design and Programming

Dr. T.W. Chim (E-mail: twchim@cs.hku.hk)

Department of Computer Science, The University of Hong Kong