

# COMP4336/9336 Laboratory General Instructions

This document includes the general information for the lab exercises of COMP4336/9336. The labs will use Android devices. You are welcome to bring your own Android device to the lab and use it for all lab tasks. If you do not have access to an Android device, you can borrow one of the Samsung Galaxy S3 devices from the central pool, which you must return at the end of each lab session.

## 1- Pre-requisites

For the lab exercises of COMP4336/9336, students will develop programs running for Samsung Galaxy S3 smart phone using Java programming language via Android Studio. While prior expertise in programming with Android Studio is not required for successful completion of these labs, you are assumed to be familiar with Java and have the ability to obtain and learn necessary materials by yourself.

## 2- Assessment

There are a total of ten 2-hour labs running from Weeks 2-11, plus a lab test to be taken on Week 12 (applicable to all students including WEBSTREAM). The lab test will basically select some questions (tasks) from labs 1-10 and you must complete those tasks using the lab environment (personal equipment will not be allowed for the test) at the university. It is therefore important for you to familiarise yourself with the lab environment during the lab sessions prior to the test in Week 12.

It is **HIGHLY RECOMMENDED** that you read the lab instructions and do some homework before attending each lab. You can download Android Studio to your own computer and try out the lab tasks before attending the lab session.

## 3- Preparation (You are supposed to finish these works before first lab)

The Android programming is based on Java. If you are beginner in Java get a Java programming book and have a quick reading on the first 2 or 3 chapters to understand some fundamental concepts of Java.

In this series of labs exercises, in order to write an android program for mobile phones. we use Android Studio, which is designed to give you a powerful, integrated environment in which to build Android applications. You have to get familiar with Android Studio IDE. You can find some useful information in this links:

This link gives you some brief information about Java programming.

<http://mobile.tutsplus.com/tutorials/android/java-tutorial/>

Here is a useful video about how you can create and run an Android project via Android Studio IDE.

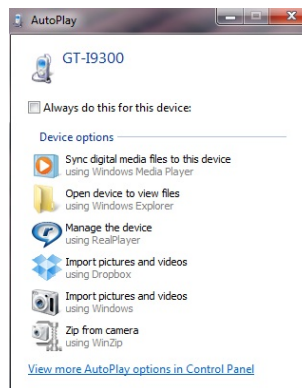
<http://www.youtube.com/watch?v=mAJeK283j0I>

## 4- Borrowing & Returning Smart phones

- Before starting each lab, get a Samsung Galaxy SIII smart phone from the lab instructor.
- The smart phone is in a box with, battery, USB cable, charger and other accessories.
- Before leaving, turn off the phone, put all the contents back to the box and return it to the lab instructor.
- The box will be checked by the lab instructor when you returning it. You are responsible for the loss or damage of any content in the box.

## 5- Connecting the smart phone PC to Your Computer

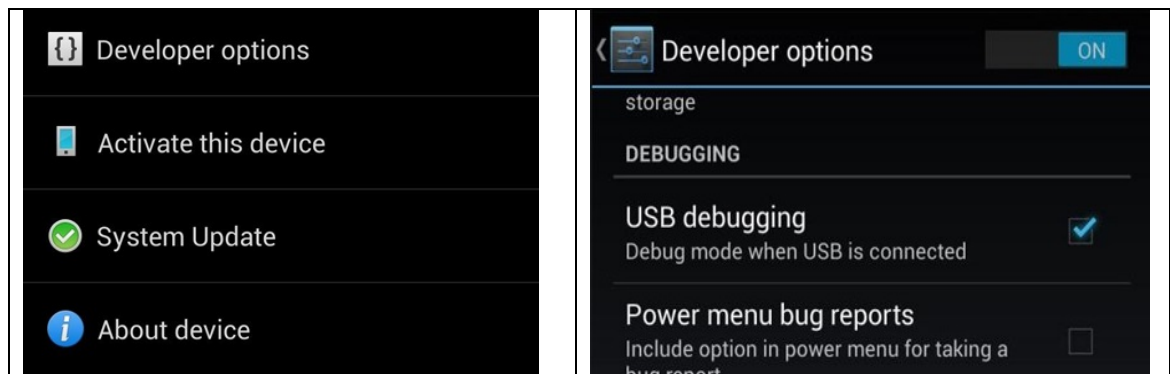
- After booting up, connect the smart phone with PC using the USB cable.
- The following window will pop up in a few seconds indicating that the connection is established.



- By clicking the “[Open device to view files](#)” button on the menu bar, you can explore the files in the smart phone. You can also drag/drop files to/from the explorer window to exchange files between the smart phone and your computer.

## 6- Enable USB Debugging

In order to run Android programs on this smart phone you have to enable USB debugging. For that, in your device, follow these steps: “Settings” -> “Developer options” -> “USB debugging”.



Note: In first run the developer option is not active. You have to active it first. In some version of Android OS, developer options is hidden and to make it visible you have to hit “build number” button in “About menu” **seven** times.

## 7- Computing Environment in the Lab

- The computers in the lab have Internet access and Android Studio is installed in all computers.
- You are not allowed to install other software on the lab computers

## 8- Using Your Own Computer

You can setup the developing environment on your own computer to:

- Prepare the lab exercises  
You can start coding on your own computer before going to the lab. You can do some preliminary tests without the real device by deploy the program into the emulator. You will learn how to use the emulator in Lab1. However, with emulator, you cannot test the functionalities relating to GPS or WiFi devices.
- Do the lab exercises  
You are allowed to bring your own computer to the lab, but you will not have wired network connectivity.
- There are other IDE to develop android application such as Android Development Tools (ADT) plugin in Eclipse IDE, which you can install and use. The final developed application is important for marking not your IDE.

To setup the environment, the following steps are required:

- Download an appropriate version of Android Studio from below link  
<https://developer.android.com/studio/>
- To install Android Studio on Windows, proceed as follows:
  1. If you downloaded an .exe file (recommended), double-click to launch it. If you downloaded a .zip file, unpack the ZIP, copy the android-studio folder into your Program Files folder, and then open the android-studio > bin folder and launch studio64.exe (for 64-bit machines) or studio.exe (for 32-bit machines).
  2. Follow the setup wizard in Android Studio and install any SDK packages that it recommends.

- To install Android Studio on your Mac, proceed as follows:
  1. Launch the Android Studio DMG file.
  2. Drag and drop Android Studio into the Applications folder, then launch Android Studio.
  3. Select whether you want to import previous Android Studio settings, then click OK.
  4. The Android Studio Setup Wizard guides you through the rest of the setup, which includes downloading Android SDK components that are required for development.
- To develop and run an Android based application you have to follow these steps, which will be explained in more details in the first lab instruction (This figure is originally from Android developer site <http://developer.android.com/tools/workflow/index.html> ).

