

Android Lab Assignment #1

Development Environment Setup and “HelloWorld”

Deadline: Feb 22nd 11:59 p.m.

Introduction

In this lab, you will configure an Android development environment using resources available online. Make sure to follow the guide, but you may make small changes that will benefit your productivity. After you completed setting up your development environment, you will create a Android application to show specific pattern and information. Then run that application on an Android Virtual Device (AVD) or physical Android device.

Assignment

1. Setup an Android development environment on your system of choice. (Hopefully you have finished it already.)
2. Create an Android application called “HelloWorld” that follow this layout pattern:



There is no specific requirement about how you implement this pattern. And there is no requirement for margin or padding or color configuration. However, make sure you have 4 views in your main activity and on each of them you fill up the required information. (Please note, “Any picture” means you need to fill up a picture in this view rather than a text line, similar to “Your Name” and “Your Team Name”.

3. Create an Android Virtual Machine (AVD) and run “HelloWorld” on the virtual device. Or connect to your physical device.

4. Write a report to simply describe your work, including your code structure diagram, complete code with necessary comment. Screen shoot on AVD or real smartphone.

Hint & Instruction

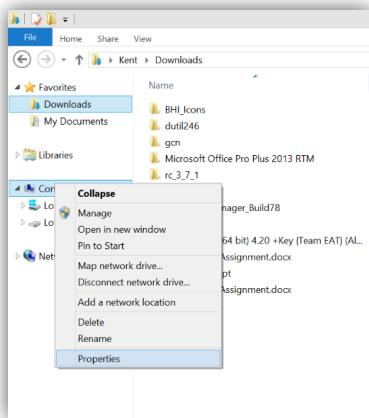
(You can either choose Eclipse or Android Studio as IDE)

Creating Your Development Environment (Eclipse)

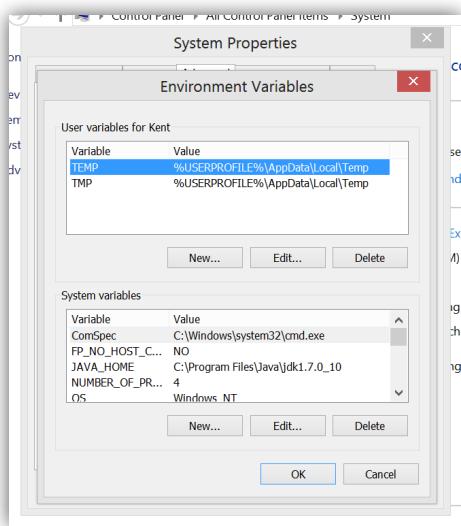
1. Download Java Development Kit (JDK)

Go to <http://www.oracle.com/technetwork/java/javase/downloads/index.html> (Java development site) to download the JDK. Once your download has completed, run the installer with administrative privileges to install both the JDK and the Java Runtime Environment (JRE).

Once the installation has completed, you will need to add a “JAVA_HOME” environment variable to your system, as well as adding the JDK binaries to your system path. In order to do this, open the Windows File Explorer, right-click on “Computer” in the navigation pane, and select “Properties” from the drop down list.



In the popped window, click “Advanced system settings” in the navigation pane. The System Properties dialog box now appears. In order to add or edit environment variables, click on the button labeled “Environment Variables...”, which will in turn display the Environment Variables dialog box.



Now, create a new system variable called “JAVA_HOME” that points to the root directory of your JDK installation. Also select and edit the “Path” variable, appending a semicolon followed by the path to the “bin” directory of your JDK installation to the end of its current contents.

2. Download and Install Android SDK

Download the Android SDK installer from <http://developer.android.com/sdk/index.html> by scrolling down the page, clicking the drop down arrow next to “USE AN EXISTING IDE”, and then clicking the “Download the SDK Tools for Windows” button.

With a single download, the ADT Bundle includes everything you need to begin developing apps:

- Eclipse + ADT plugin
- Android SDK Tools
- Android Platform-tools
- The latest Android platform
- The latest Android system image for the emulator

If you prefer to use an existing version of Eclipse or another IDE, you can instead take a more customized approach to installing the Android SDK. See the following instructions.

[^ USE AN EXISTING IDE](#)

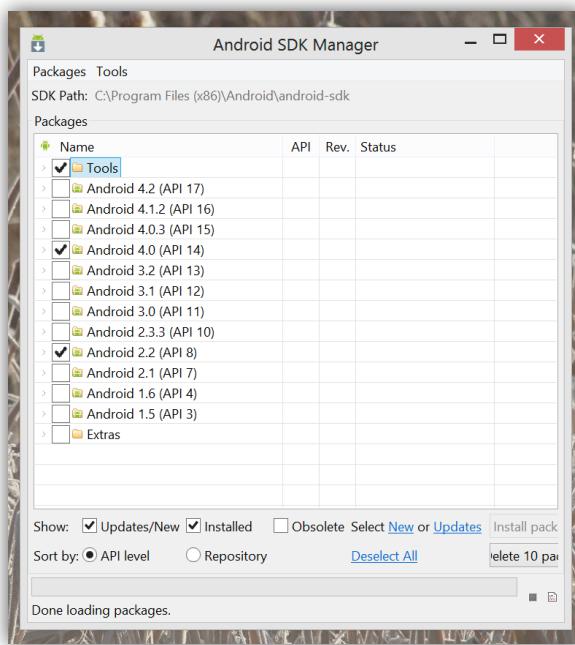
If you already have an IDE you want to use for Android app development, setting up a new SDK requires that you download the SDK Tools, then select additional Android SDK packages to install (such as the Android platform and system image). If you'll be using an existing version of Eclipse, then you can add the ADT plugin to it.

[Download the SDK Tools for Windows](#)

[▼ SYSTEM REQUIREMENTS](#)

[▼ DOWNLOAD FOR OTHER PLATFORMS](#)

Once the download has completed, run the installer wizard. The wizard will install the Android SDK tools onto your system, and create start menu shortcuts for both the Android SDK Manager and the Android Virtual Device (AVD) Manager. Open the Android SDK Manager.



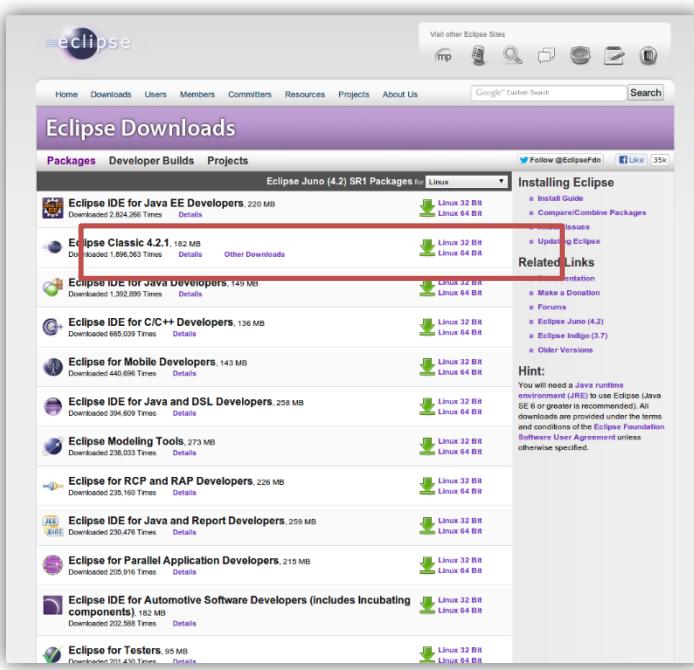
As can be seen in the image, the Android SDK Manager displays a list of all available tools for all available API levels (versions) of the Android operating system. Select the API levels you want to use for this course (you can always add more later). Keep in mind that although Android is fully backward compatible, applications made for new versions of Android cannot be run on any older version of the OS. Because only 30% of Android devices available today are updated beyond Android 4.0, it is recommended that you install and use the tools for Android 2.2. However, it is also recommend that you download and play with the tools for Android 4.0 so that you are familiar with the newer systems as well.

Be sure to select and download the Google USB Driver and Google Web Driver available in the “Extras” category. This will allow you to have plug-and-play support when connecting your Android devices to your system for debugging purposes.

Once you have made your selections, click the “Install x packages” button, accept the license agreements, and allow the SDK manager to install the tools you need. The tools for each version of Android can generally be measured in the hundreds of megabytes, so be prepared to allow a lot of time for all of your selections to download and install. Once the download is completed and installed successfully, close the Android SDK Manager.

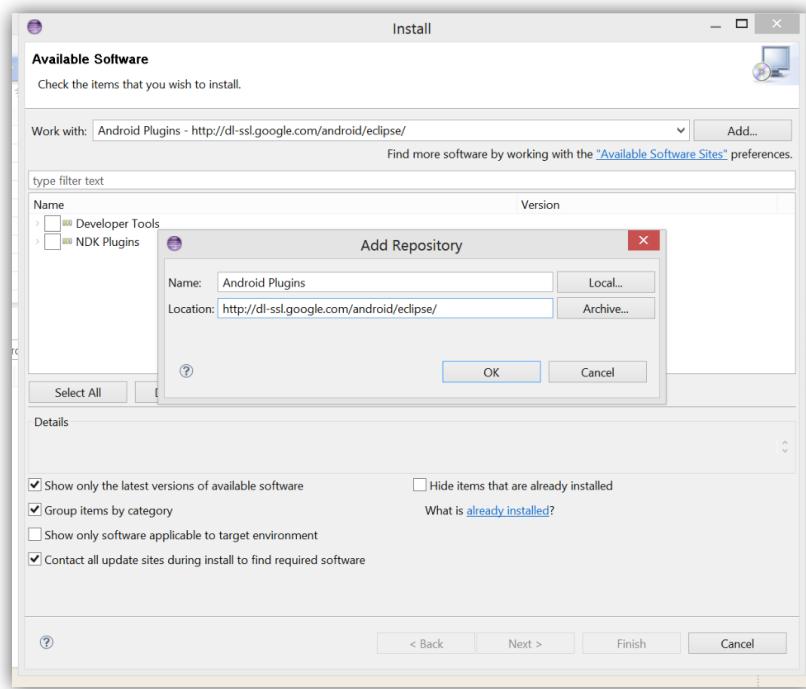
3. *Install Eclipse*

Eclipse is available as a free download at <https://www.eclipse.org/downloads/packages/eclipse-classic-421/junosr1>. Multiple versions of Eclipse are available, each with a set of included tools customized for a certain programming purpose. For developing for Android, we will need to install our toolset separately. So please download “Eclipse Classic”, which does not come with any preconfigured extras or bloat. Be sure to select the version of Eclipse that matches your version of Java (either 32-bit or 64-bit).

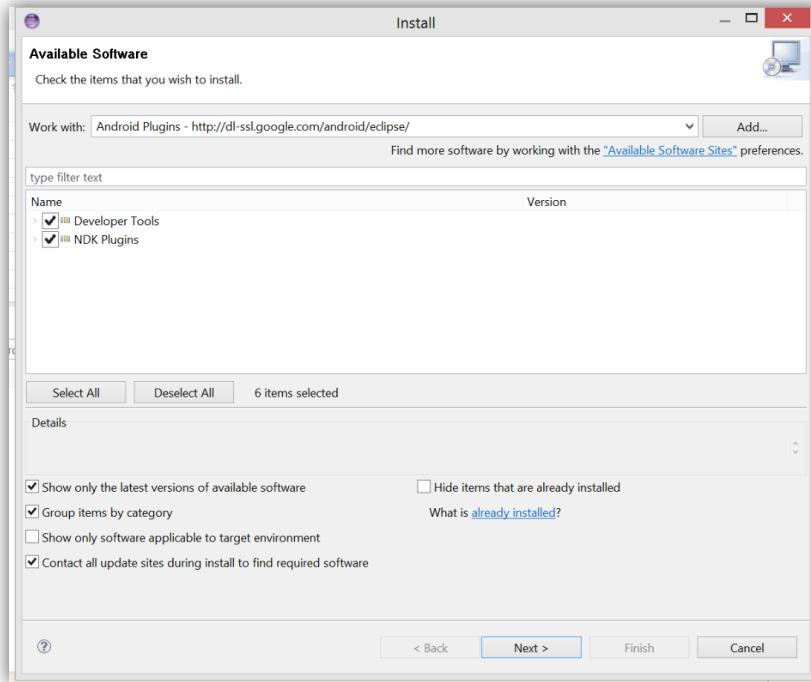


Once the download has completed, extract the .zip archive to a location on your file system that you have read and write access to. You can then launch Eclipse by executing “eclipse.exe”, which is located in the root directory of the extracted Eclipse files, with no installation being necessary.

When Eclipse launches, it will prompt you to choose a location for your working and source code files and then display a welcome screen. Close the welcome screen, and select Help>Install New Software... from the menu bar. In the dialog box that appears, click the “Add...” button. Create a new repository called “Android Plugins” and located at <http://dl-ssl.google.com/android/eclipse/>. The dialog box should now appear as below.



Once you click the “OK” button, Eclipse will download the metadata associated with the plugins included in the Android repository and then display them in the Install window. Select all of the available plugins from the Android Plugins repository so that your selections match the image below.



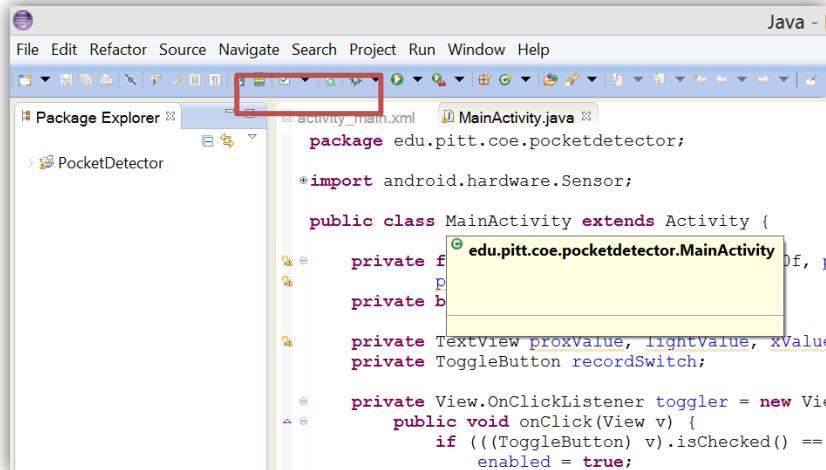
After making your selections, hit the “Next >” button and proceed through the steps to install the plugins. At some point you will get a warning about installing unsigned content –

simply accept it, the plugins are safe. Eclipse will prompt you to restart after the installation is finished.

Creating Your First Application on Eclipse

1. Download Java Development Kit (JDK)

After Java, Eclipse, and the Android SDK are all installed and running, you can begin creating Android applications. After launching Eclipse, you will notice that there are now four extra buttons on the toolbar. One of the buttons is a link to launch the Android SDK Manager, and the other launches the Android Virtual Device (AVD) Manager.



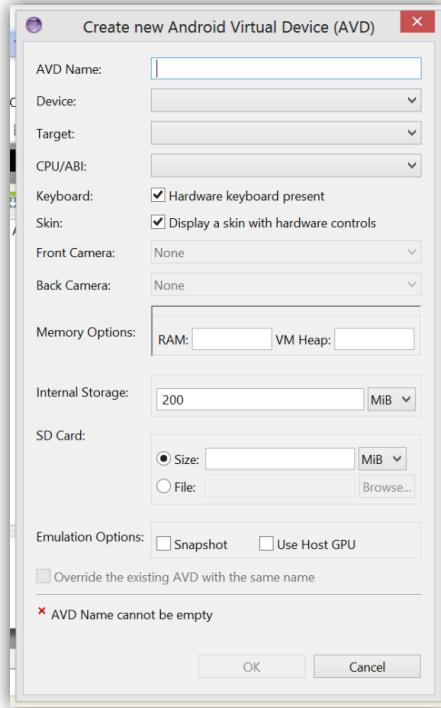
To debug and test your future Android applications, you need to create an AVD. The AVD will allow you to see (approximately) how your app will run on a phone of any size and configuration.

To create your first AVD, click the button that looks like a little Android phone (the second from the left in the previous screenshot). The Android Virtual Device Manager dialog box will appear as shown below.



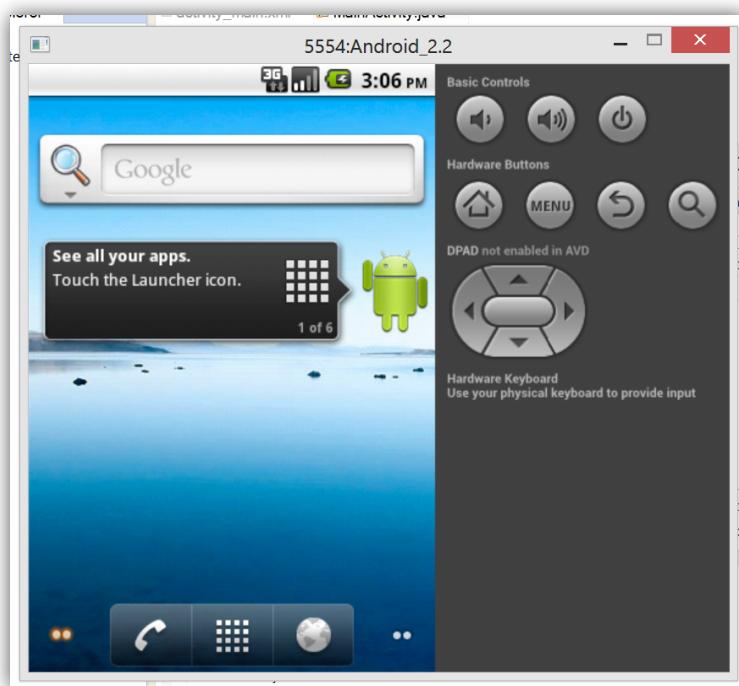
The AVD Manager currently shows that there are no AVD's available. To create a new

AVD, click the “New...” button to display a dialog box that will allow you to specify all of the settings for your new device.



Create a new AVD that you need. Notice that the target version of Android that is run on your AVD can only be selected from the platform tools that you previously downloaded through the Android SDK Manager. If you are running an AVD of version 4.0 or higher, it is recommended that you check the “Use Host GPU” checkbox in order to offload some of the graphical work of the emulator onto your graphics card/chipset instead of your CPU.

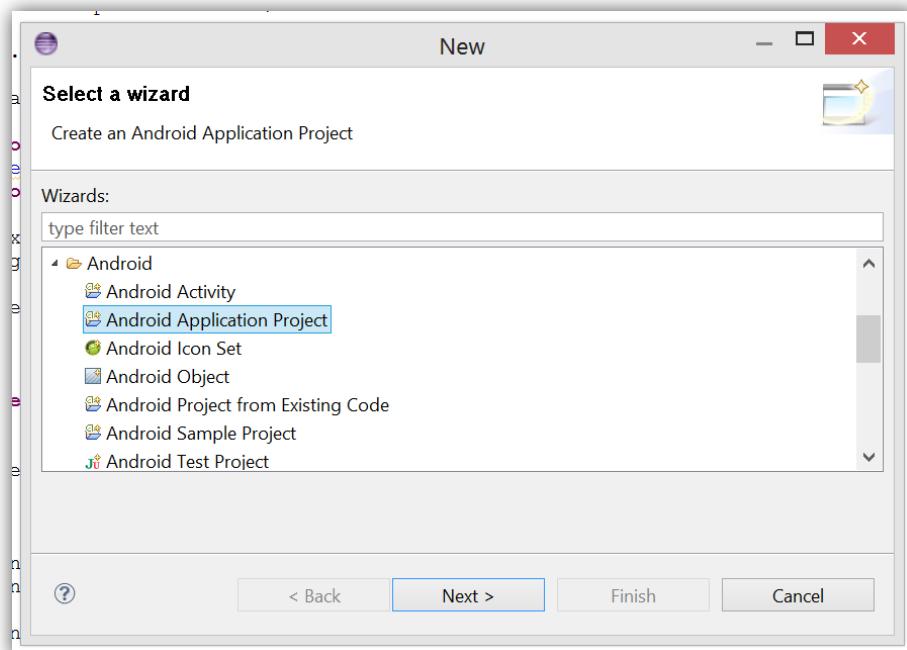
After configuration, click the “OK” button to create your AVD. You can then select and launch your AVD from the AVD Manager by selecting it from the list and clicking the “Start...” button. Do that now in order to verify that everything functions correctly. Your AVD should appear and display something similar to what is shown below.



Once you have verified the functionality of the AVD, close it and return to the main Eclipse window.

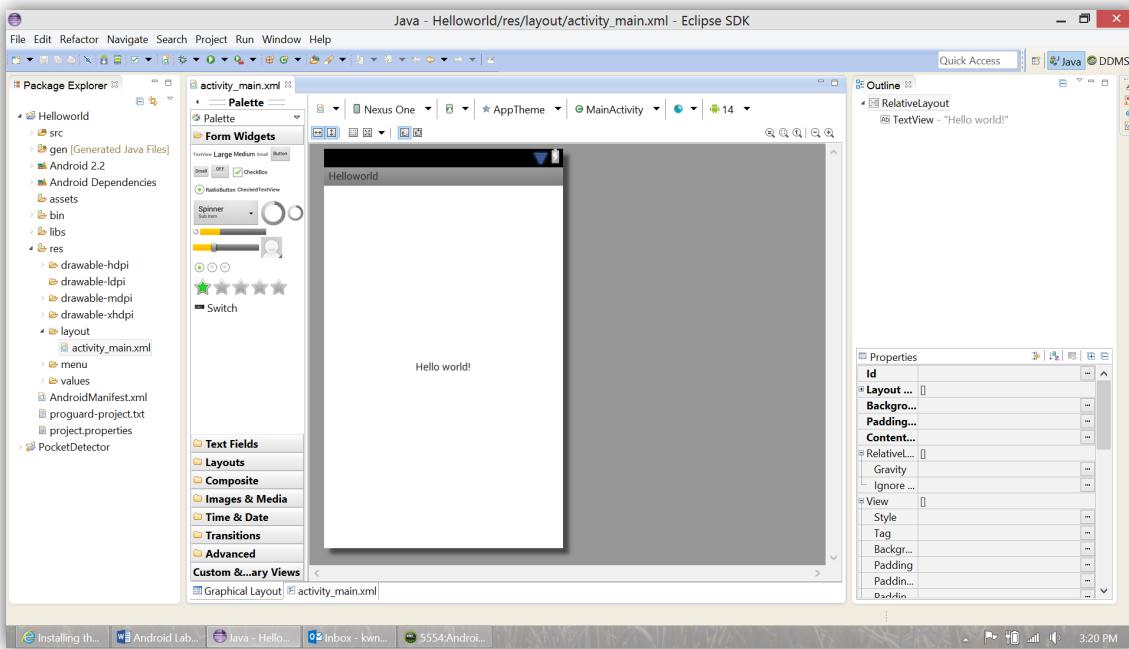
2. Create a New Android Application

To create a new Android application, select File>New>Other... from the menu bar. In the dialog box that appears, select Android>Android Application Project and click the “Next >” button.

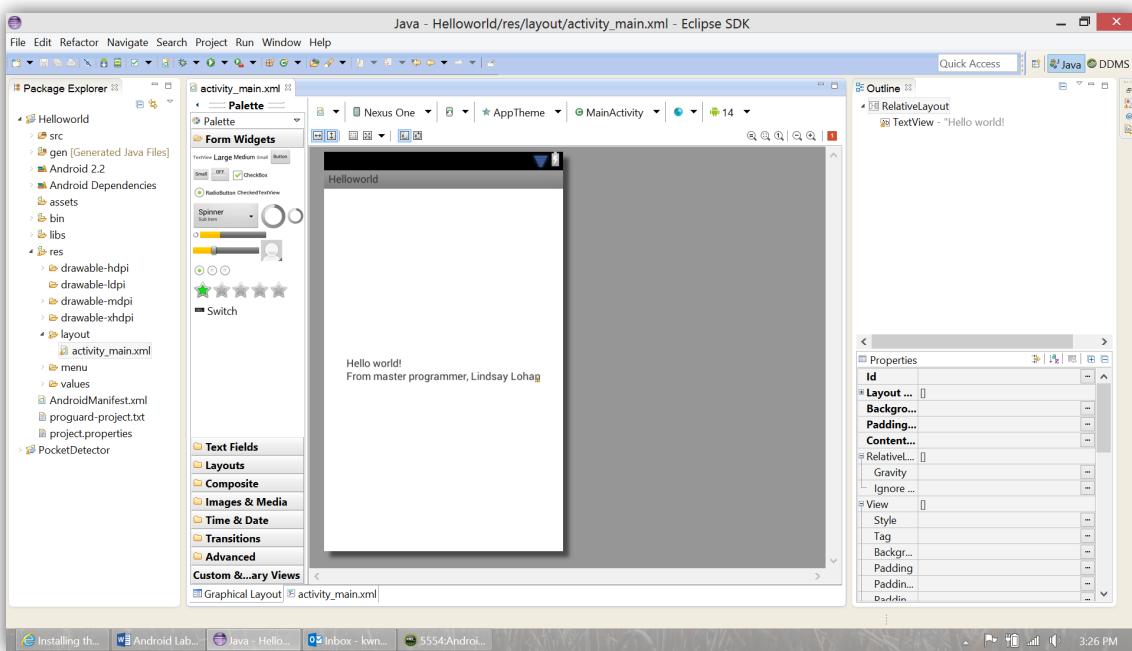


Follow the wizard to make a blank activity called “Helloworld”. Make sure that your application supports Android 2.2 by setting the “Minimum Required SDK” and “Compile With” options to API 8 (you will have to select “None” as the theme).

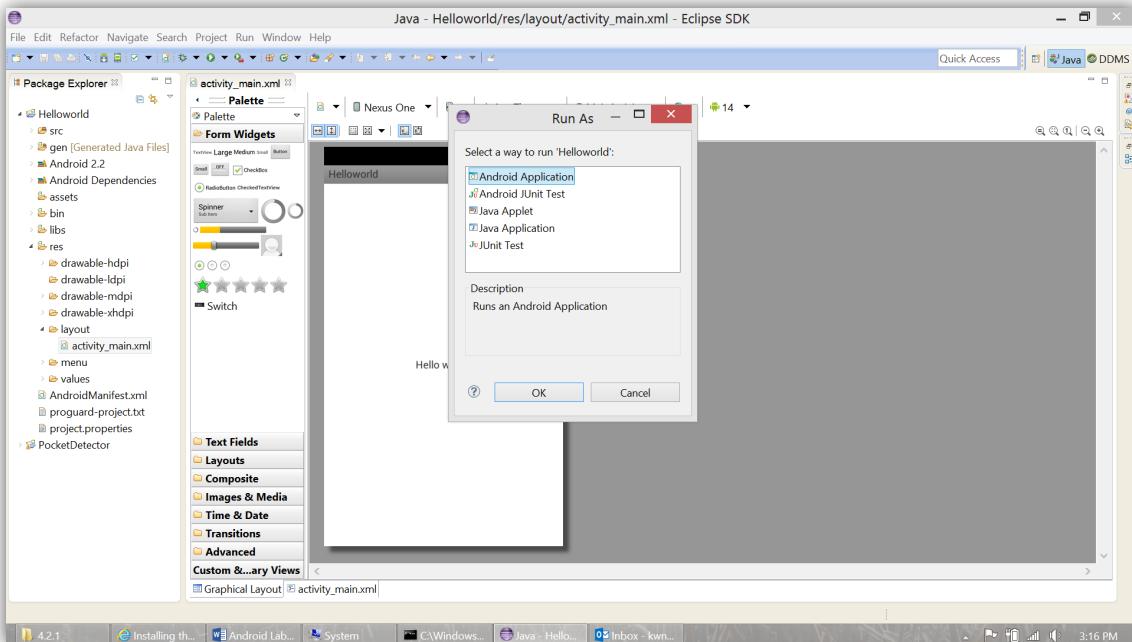
After finishing the wizard, your application will be created and you will be presented with a screen as shown below. If not, navigate to the activity_main.xml file in your Helloworld application and select “Graphical Layout”.



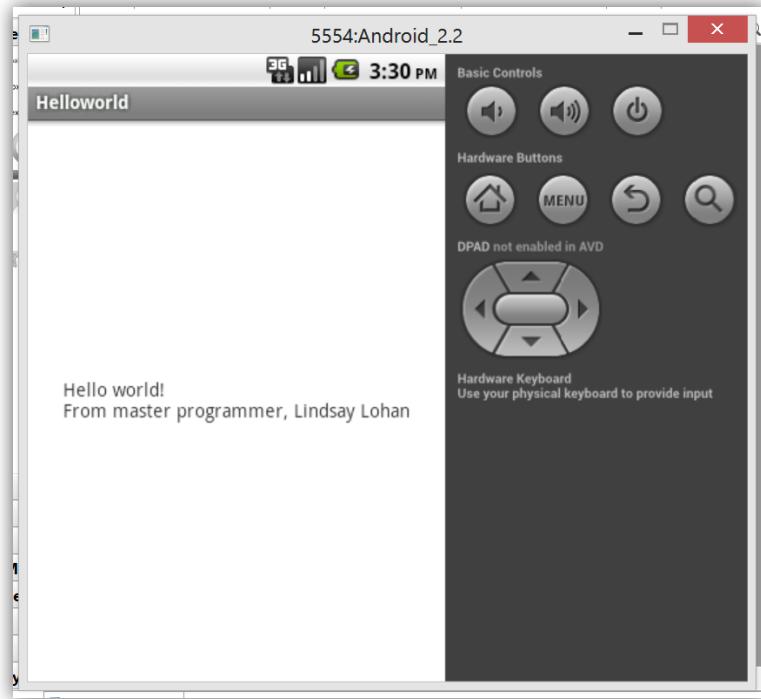
In order to display your name in the application, you will need to change the text in the center of the application from “Hello world!” to something else. This can be accomplished in different ways. The most simplistic of which is to double-click the “Hello world!” text. Eclipse will display the pure XML code that describes your application’s layout. Change the “@string/hello_world” string in the line “android:text=”@string/hello_world”” to whatever you would want it to display instead (preferably your name). You can switch back and forth between the XML and the graphical view of your layout to preview your changes by clicking the tabs at the bottom of the screen.



Once it is done, you can run your app on your AVD by clicking the green play button on the toolbar at the top of the screen. Eclipse will then prompt you to select what to run the application as. Select “Android Application” from the list and then click the “OK” button, as shown below.



If everything was configured correctly, Eclipse will now automatically launch your previously created AVD, install your application onto it, and launch the application. Take a screenshot of your app running in your AVD as shown below and submit it in your report. Also, please print the generated Java script.



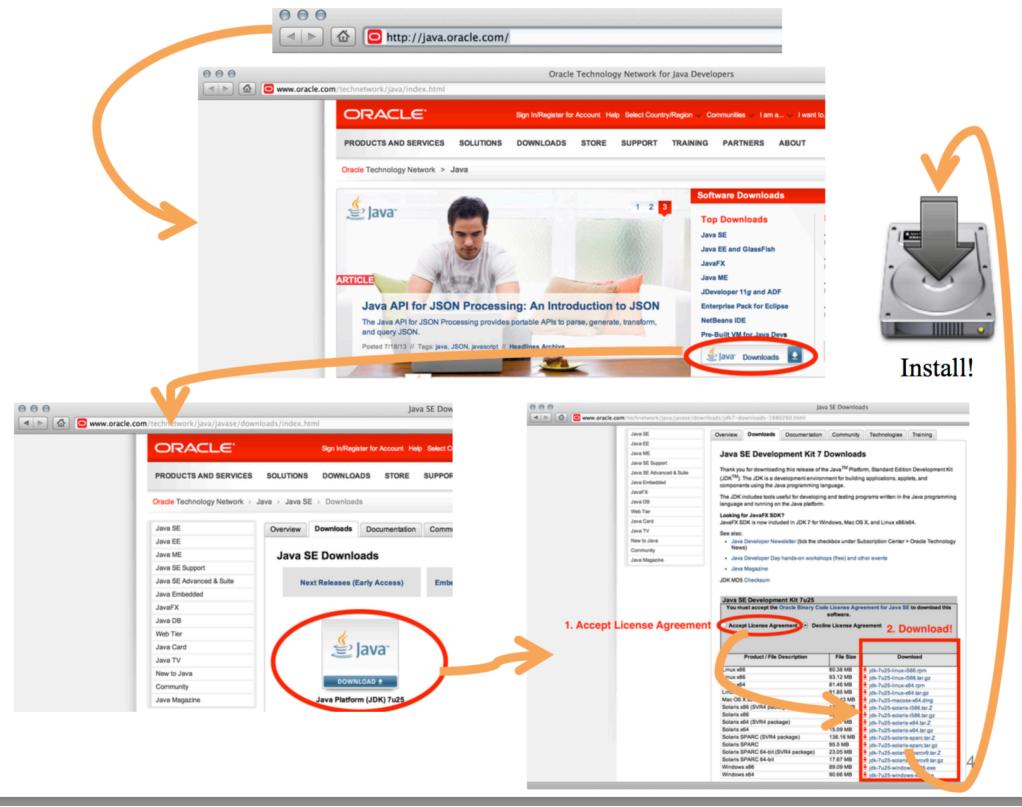
Creating Your Development Environment (Android Studio)

1. Install java development kit (JDK)

You should first install Java Development Kit to write JAVA programs. Download the JDK for your OS at <http://java.oracle.com>.

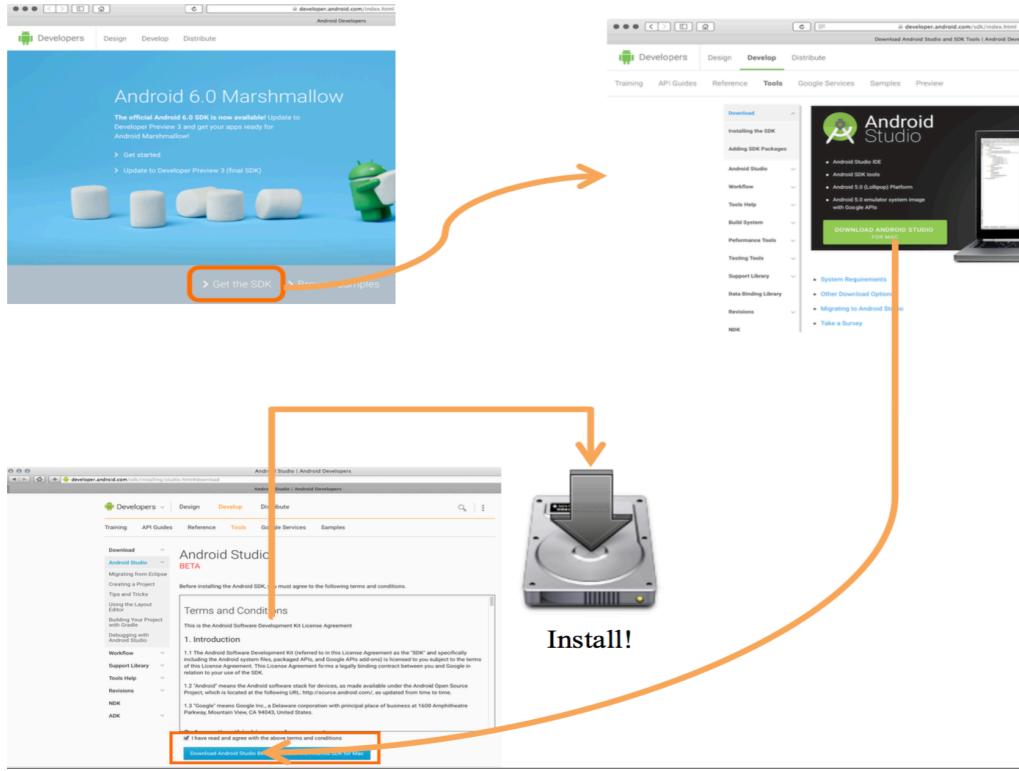
Alternatively, for OS X, Linux:

- OS X:
 - Open/Applications/Utilities/Terminal.app
 - Type javac at command line, install Java at prompt
- Linux:
 - Debian/Ubuntu: sudo apt-get install java-package, download the JDK <jdk>.tar.gz file from Oracle, run make-jpkg <jdk>.tar.gz, then sudo dpkg -i <resulting-deb-file>
 - Fedora/OpenSuSE: download the JDK .rpm file from Oracle, install



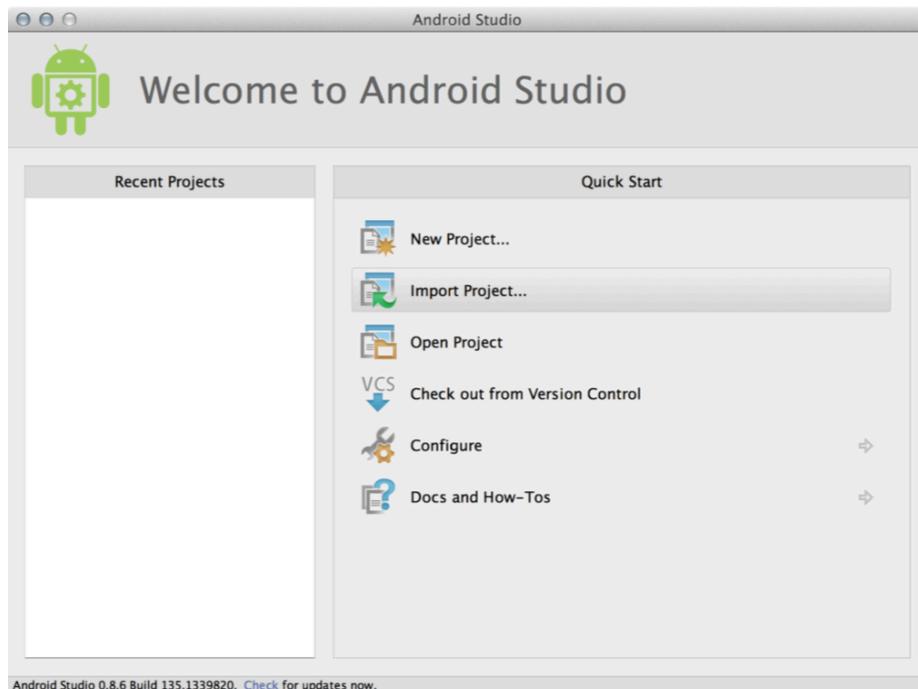
2. Download Android SDK

Download Android SDK from <http://developer.android.com>. Then, download and install Android Studio bundle (including Android SDK) for your OS.

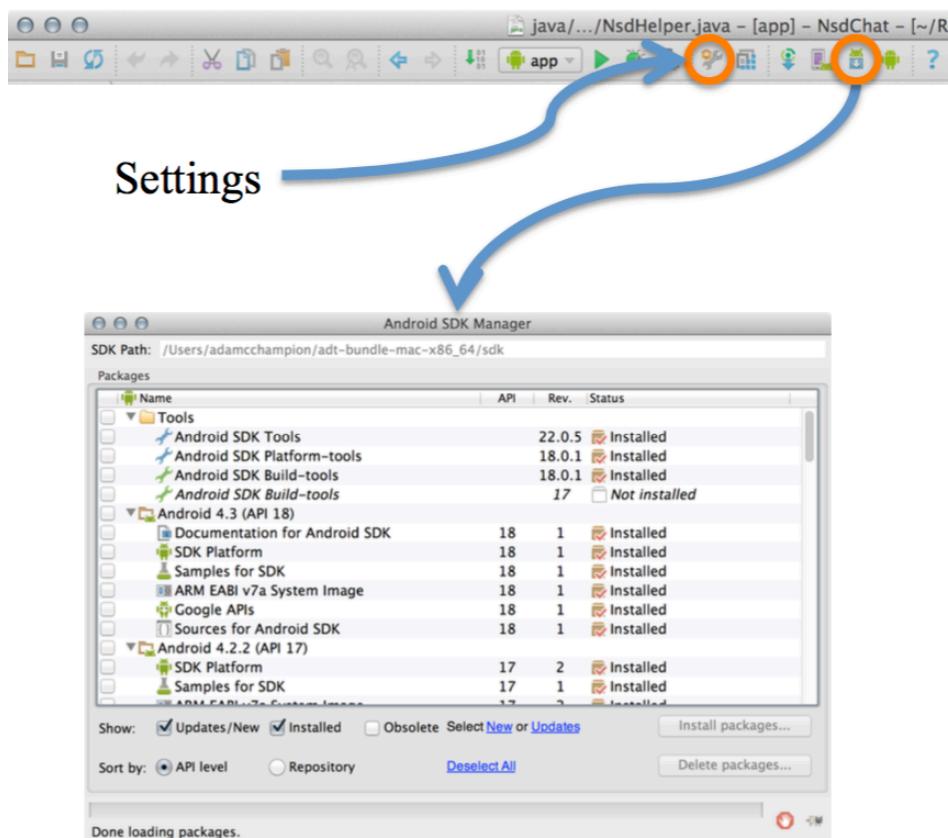


3. Install Android Studio

Install Android Studio directly (Windows, Mac); unzip to directory android-studio, then run ./android-studio/bin/studio.sh (Linux). Then you will see:



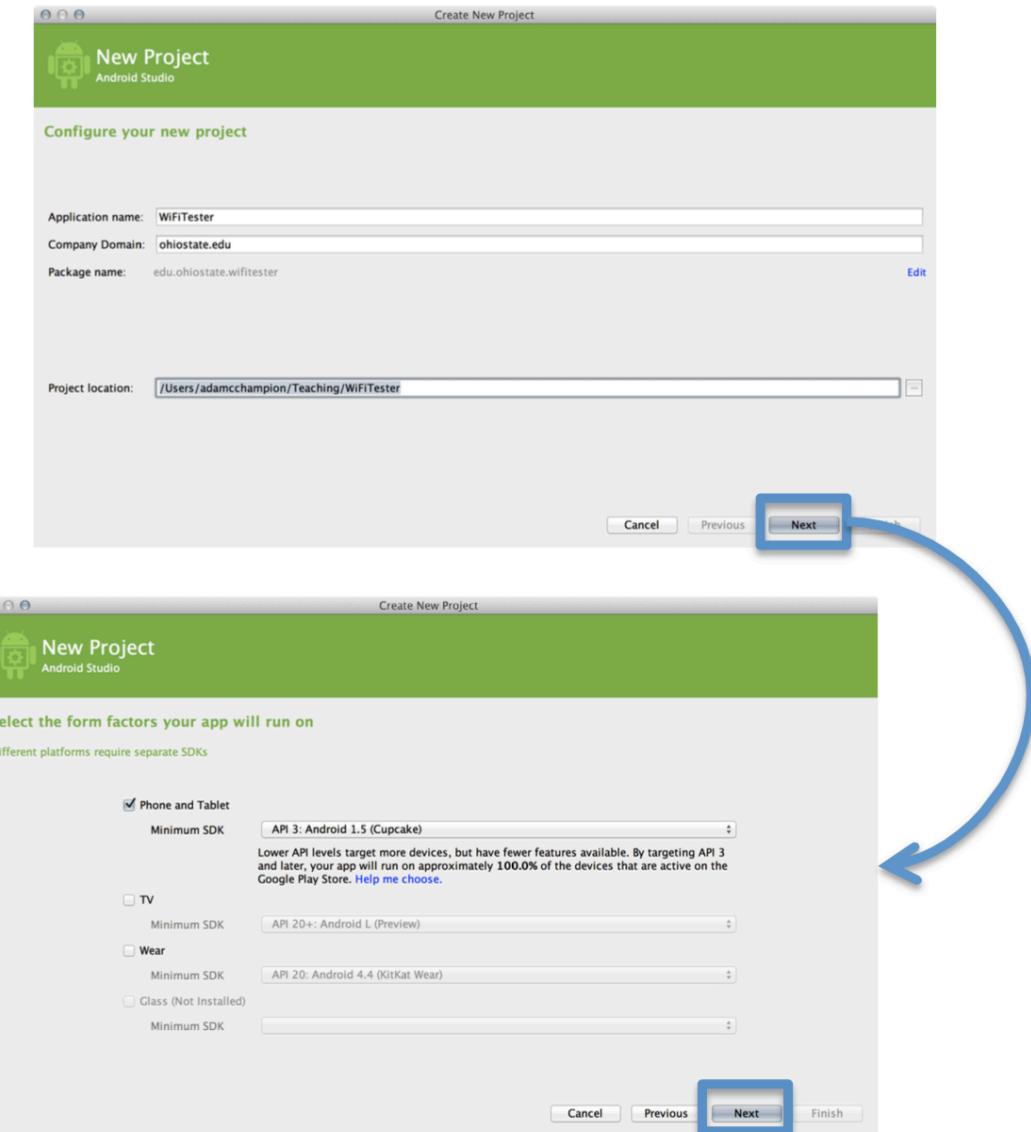
You can check the setting about SDK and Android API level in Android SDK Manager:



Creating Your First Application on Android Studio

1. Create Android APP

Creating Android app project in Android Studio: Go to File→New Project, Enter app, project name and Select APIs for app, then click Next.



2. Determine Activity Type

Determine what kind of Activity to create; then click Next. You can choose a Blank Activity for simplicity. Enter information about your Activity, then click Finish. This creates a “Hello World” app.



3. Deploy the Application

You can plug in your real device; otherwise, create an Android virtual device.(Emulator is slow. So you can try Intel accelerated version, or perhaps <http://www.genymotion.com/>). Then run the app: press “Run” button in toolbar.



