

Lab Assignment 1: Getting Started with Android (2%)

Introduction

The main goal of this lab is to familiarize you with Android Studio and learn the fundamentals of developing Android applications, including project creation and coding, and running an app on a physical or virtual Android device.

Objectives

After completing Lab Assignment 1, you will be able to:

- Set up the Android development environment.
- Create a basic "Hello World" Android application containing a simple graphical user interface (GUI).
- Use Android Virtual Device (AVD) Emulator to run an app.

Create a new Android project

1. Launch **Android Studio**.
2. Once Android Studio has finished loading, you will be greeted by the welcome screen.
3. Click **Start a new Android Studio Project** from the Welcome to Android Studio screen. You can also select File\New Project from the menu to create a new project.

Note: Be sure to keep track of the path to project location.

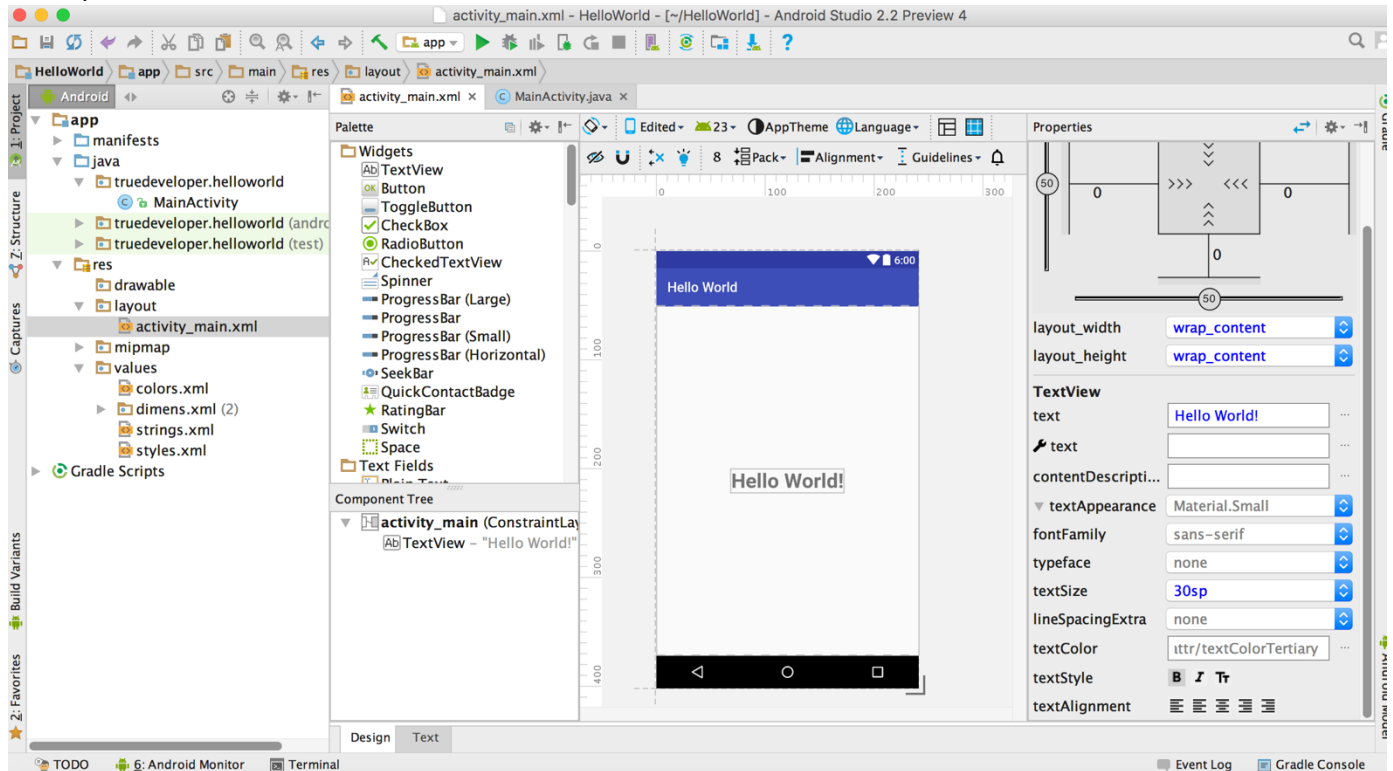
4. Enter **Hello World** in Application name. Feel free to choose any name in the Company Domain text field. As you type, you'll notice the Package Name will automatically change to create a reverse domain style name based on your Application name and Company Domain.

The Package Name is used to uniquely identify your app from other apps on the target device.

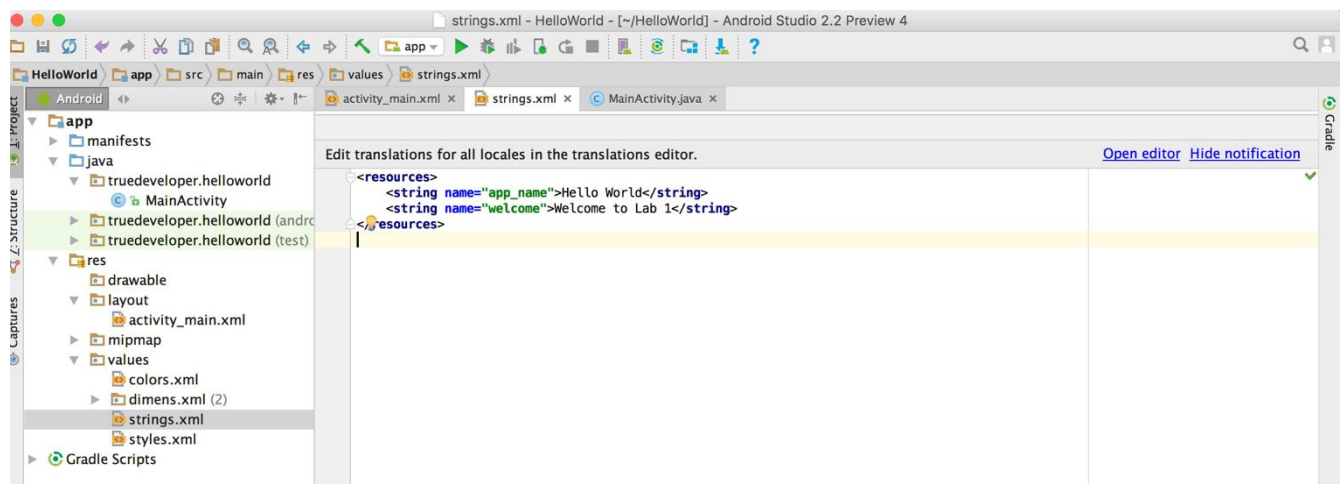
5. Click **Next** at the bottom of the window to select device types and operating systems to target. Choose the default option alongside the default **Minimum SDK**. This specifies the minimum API Level on which your application can run.
6. Click **Next** to bring up the Create Activity screen. Choose BlankActivity from the list.
7. Click **Next** and keep the default names for the main activity and layout.
8. Click **Finish**. You will be taken to the GUI layout window as shown below.
9. Double click on the activity_main.xml file and select the "Hello World" TextView. Change the font size to 30sp and the text style to Bold.

10. Change the TextView's text property to the string "Welcome to Lab 1". Note that a yellow warning yellow will appear to indicate that hardcoded string "Welcome to Lab 1" should use "@string" resource reference, which points to the strings.xml file.

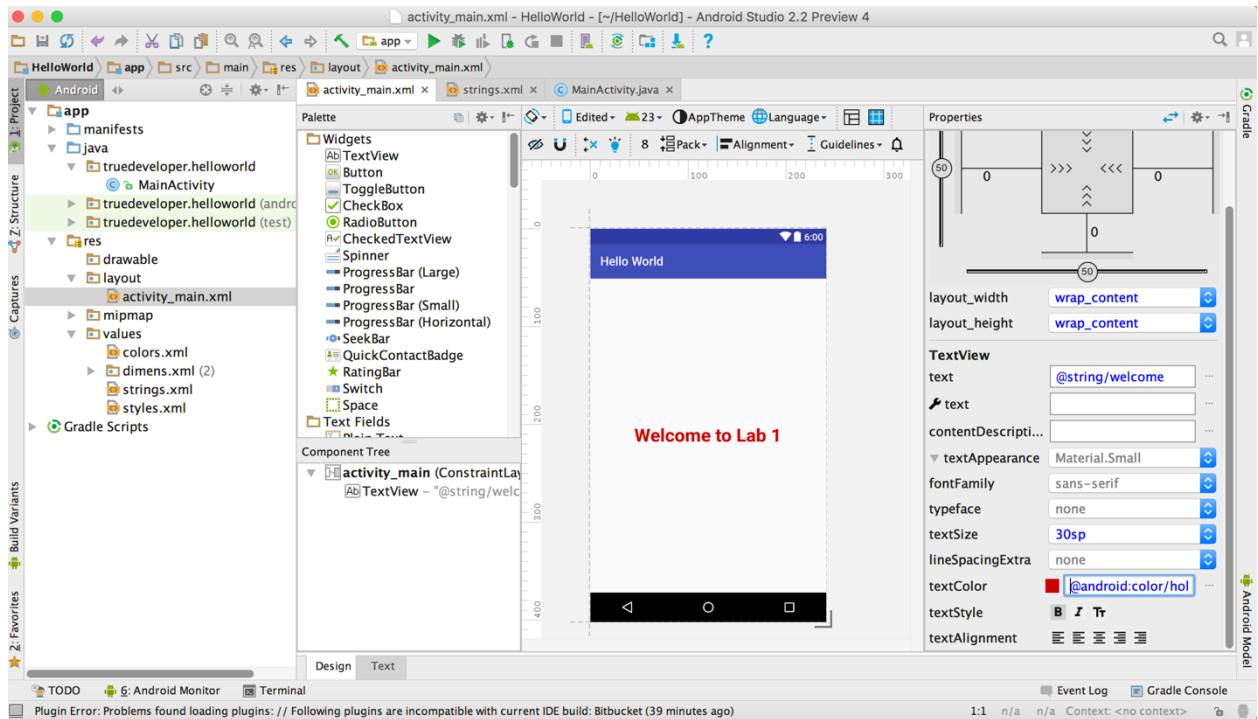
GUI Layout Window



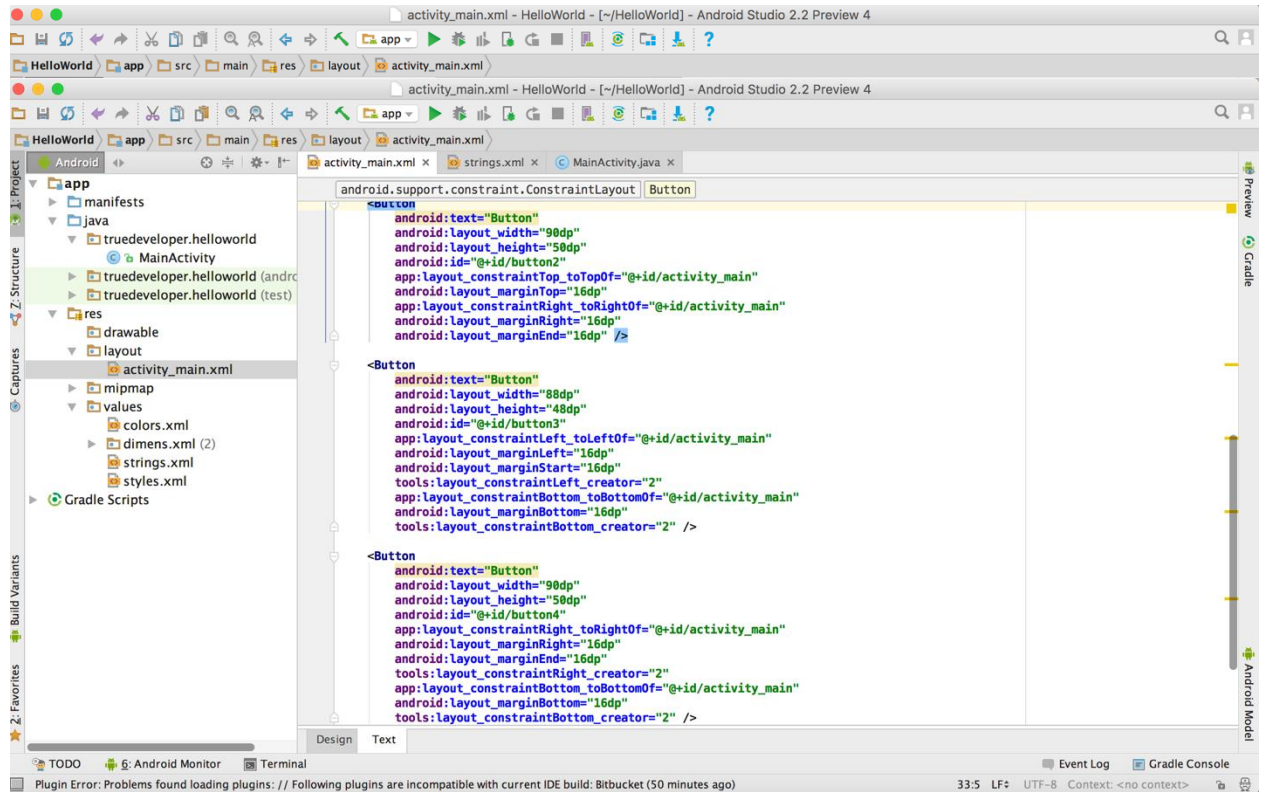
11. A string resource containing the "Hello world!" display text has been placed into the res/values/strings.xml file. Add a new XML tag name "welcome" with a value set to "Welcome to Lab 1" as shown below.



12. Return to the activity_main.xml window. Change the TextView's text property to @string/welcome and hit Enter.
13. Change the textColor property to @android:color/holo_red_dark and hit Enter. The layout window should look like the screenshot below.

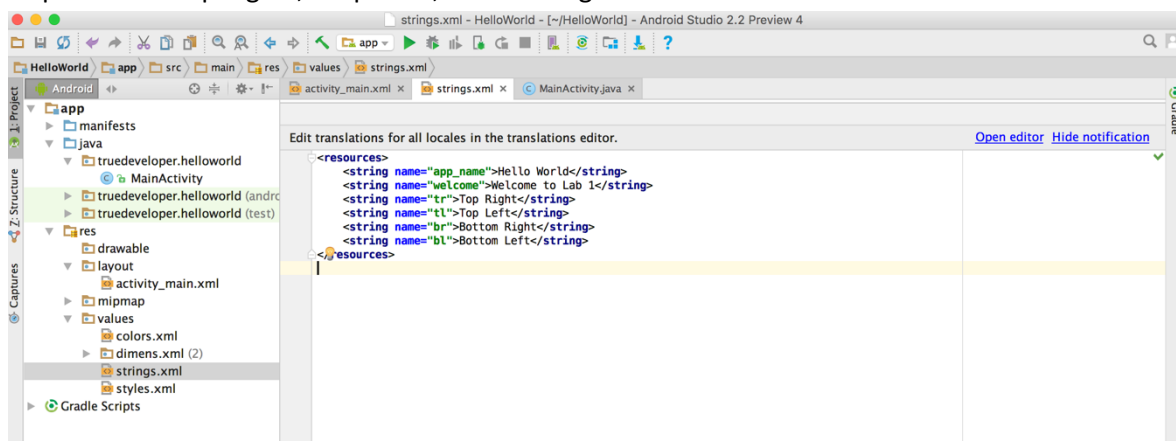


14. Drag four buttons from the palette window and place them on the four corners of the main layout window as shown below. Make sure you place the buttons on the edges of the dotted redlines that appear when you move the buttons close to the corners to add the necessary constraints.

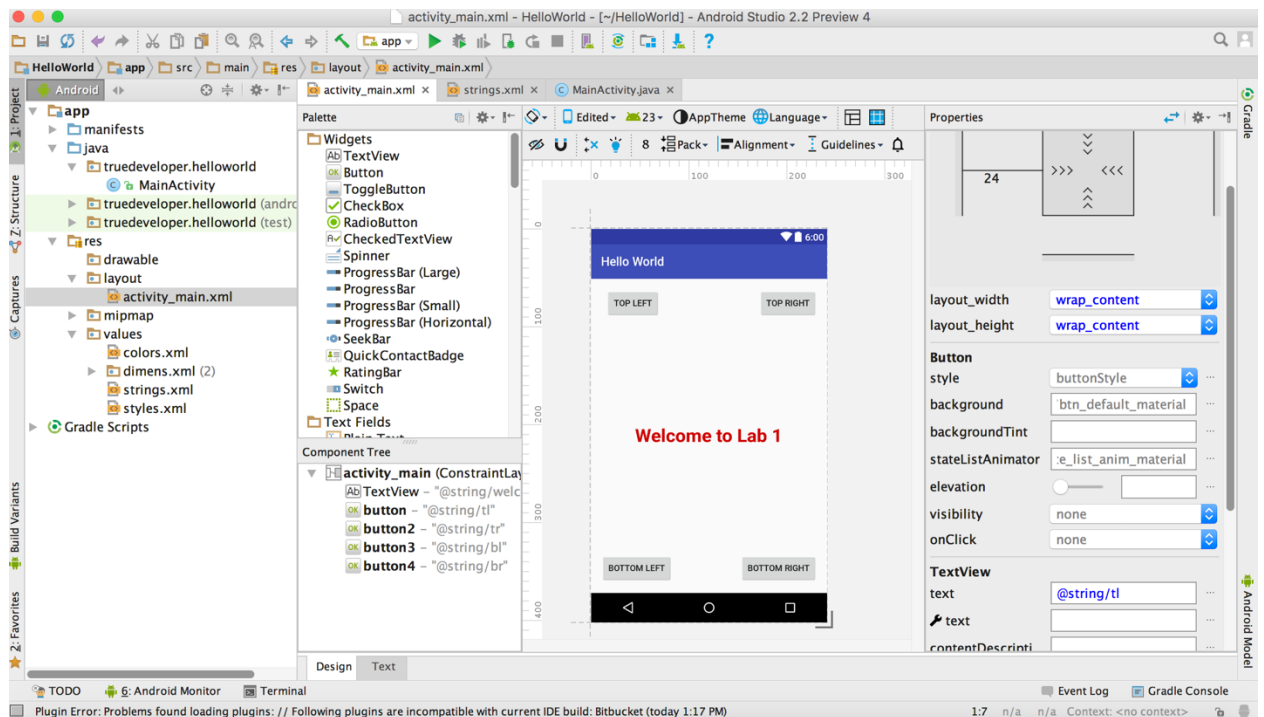


15. Select the Text view from the Design/Text tab to make sure two constraints are added to each button in the layout XML file, as shown below.

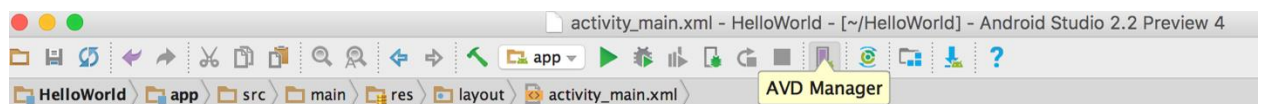
16. **Return** to the Design view. Note that four warning signs appear on the buttons because the text value is hardcoded. Fix these warnings by adding 4 XML tags to the res/values/strings.xml file like step 12. Use "Top Right", "Top Left", "Bottom Right" and "Bottom Left" values as shown below.



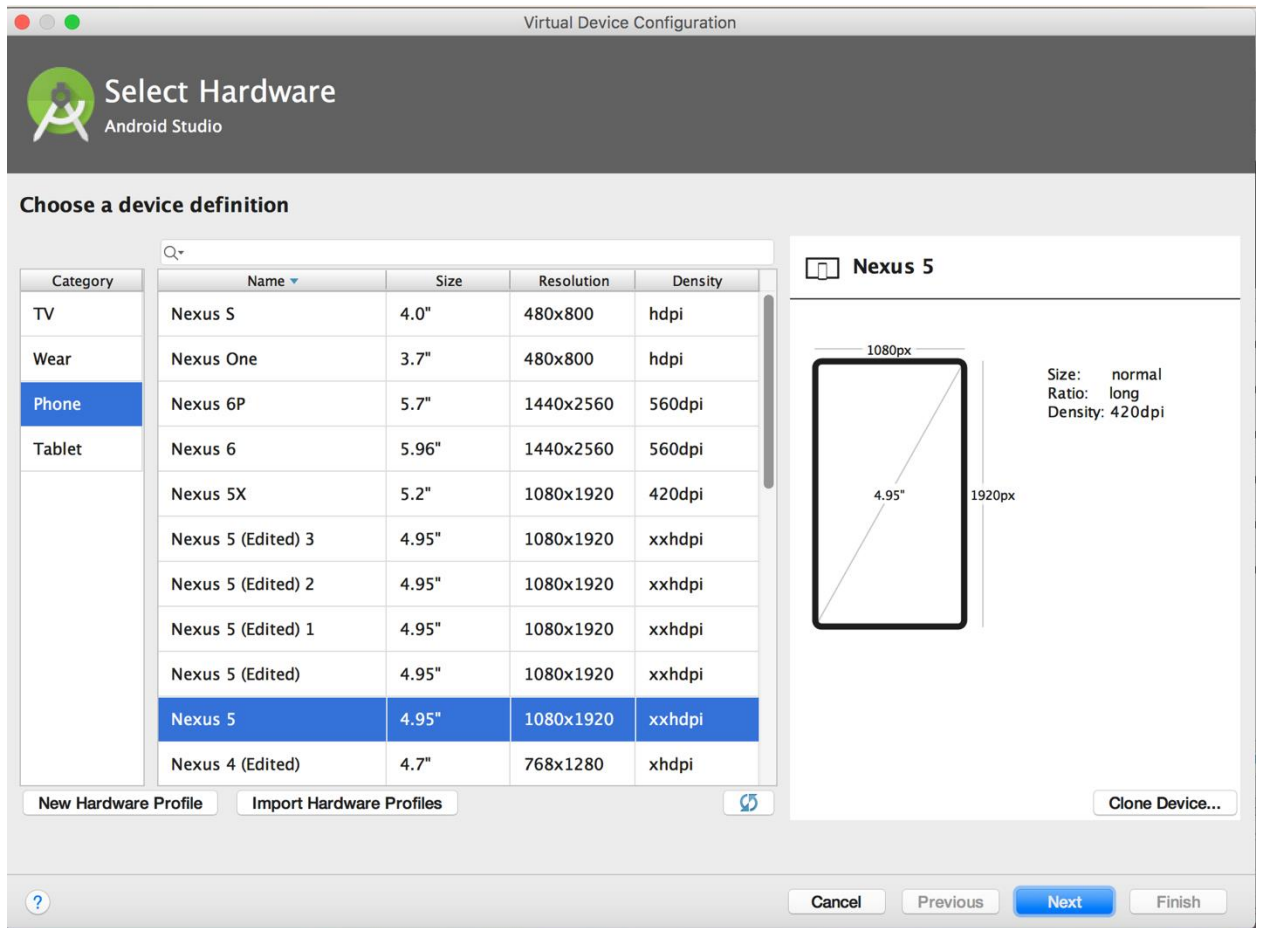
17. Set the width and height properties of all buttons to “wrap_content”. The layout view should look like the screen below.



18. To run the current version of the App on an Android Emulator, we need to create an Android Virtual Device. Click on AVD Manager icon.



19. Click on Create Virtual Device, Clone Device.

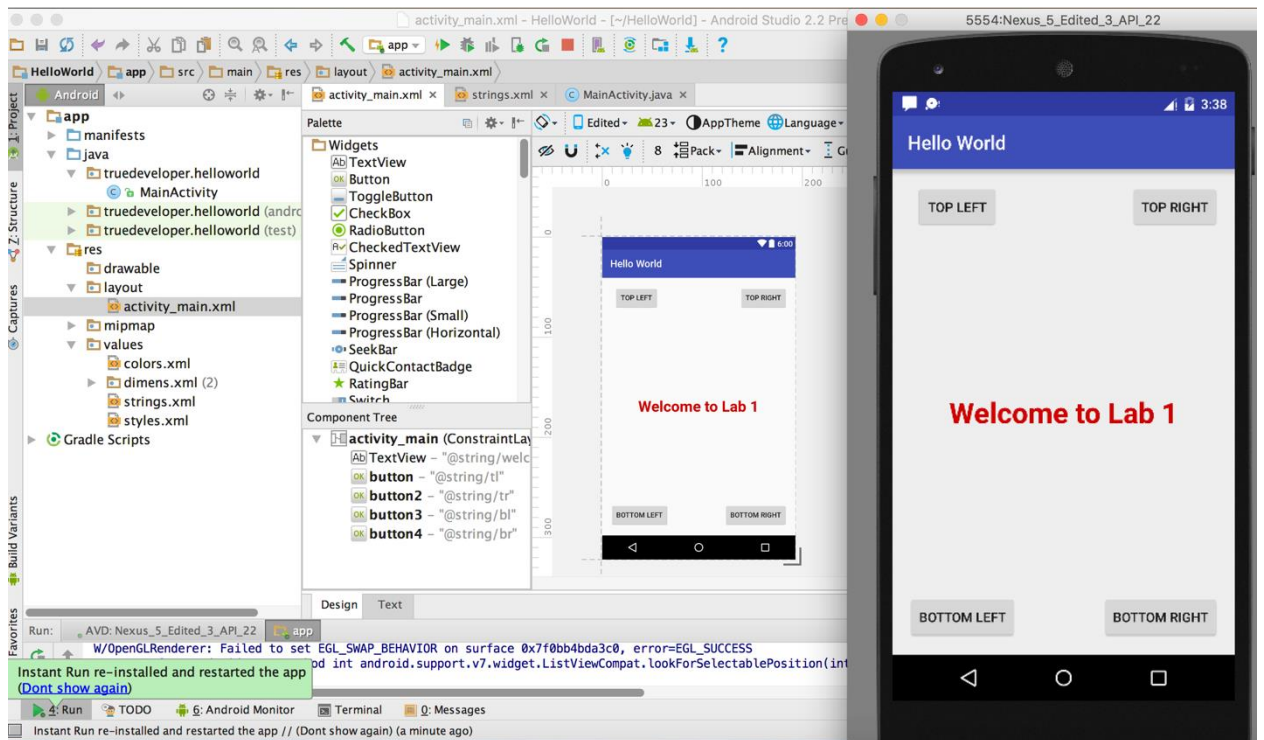


20. Choose Phone, Nexus 5 and click next. Keep the default settings and click Finish.

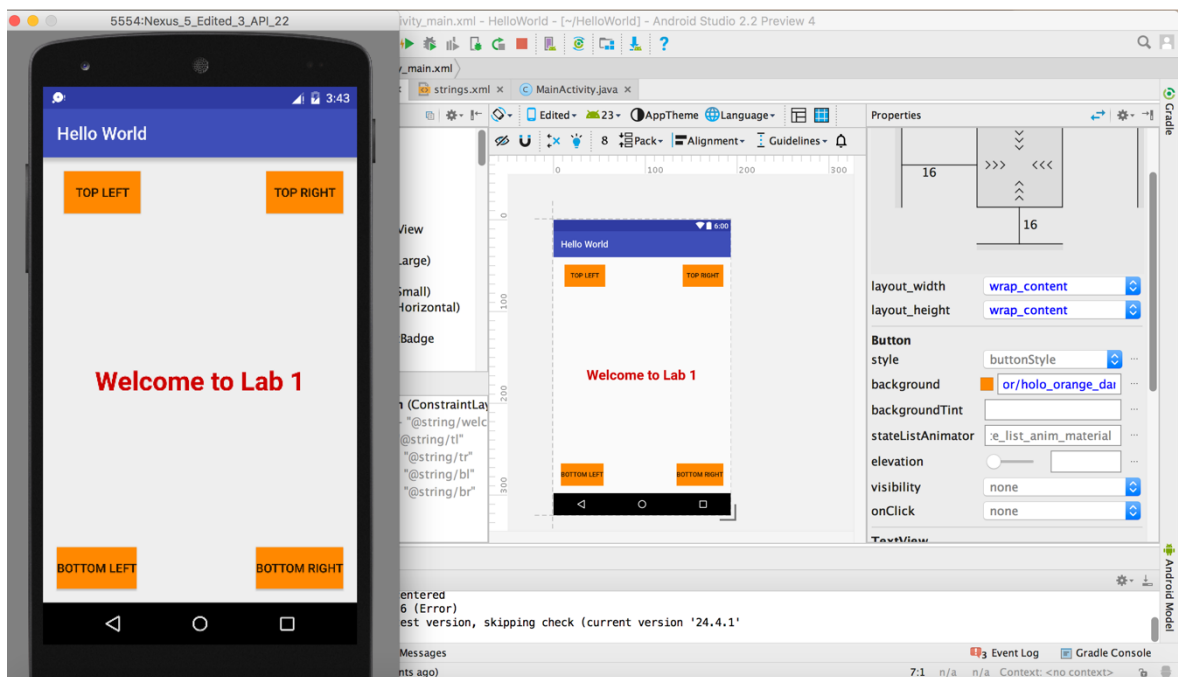
21. You can now run the App on the Emulator. On the main window, Click "Run"



22. Choose “Nexus 5” from the “Available Emulators” list. The app layout should look like the screenshot below.

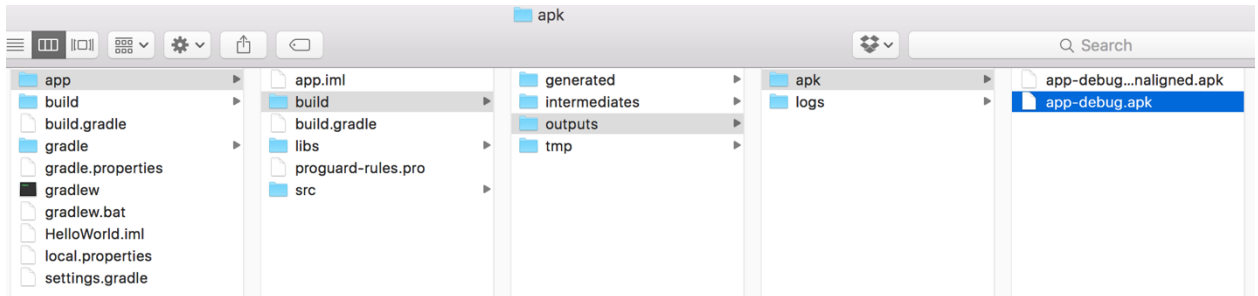


23. Change the background color of all buttons to @android:color/holo_orange_dark
24. Run the App on the AVD. The App should look like the screenshot below.



Submission Instructions

1. Open a Windows Explorer window (Finder on Mac) and navigate to the project source code location (from step 3)



2. Copy the app-debug.apk file to your desktop. Rename the file to <lastname_firstname_lab01.apk> and upload it to the lab assignment drop box and send a copy to tru.cs.android@gmail.com
3. Keep a copy of the project workspace for your record. The instructor might ask you to submit it during the marking process.

Marking rubric

Component	Marks	Description
Presentation	10%	- App design including, fonts, colors, sizes, etc.
Basics functionality	55%	- All the bare basic requirements of the simple layout must be satisfied and basic components are aligned perfectly.
Bug-free	35%	- App doesn't crash when clicking on buttons
TOTAL	100%	