Lab Manual

Lab (1): Introduction

Visual Programming for Smart Devices lab

Instructor: Oraib M Alrashdan

❖ Objectives:
1. Set up Android Studio.
2. Create a new Android application.
3. Create an Android Virtual Device and start the Android Emulator.
4. Run the application

❖ Android is:

- ✓ mobile operating system maintained by **Google**
- ✓ runs on phones, tablets, watches, TVs, ...
- ✓ based on **Java** (dev language) and **Linux** (kernel)
- ✓ code is released as open source (periodically)
- ✓ easier to customize, license, pirate, etc. than iOS

❖ Android version:

Version	API level	Date	Name
1.0-1.1	1,2	Sep 2008	none
1.5	3	Apr 2009	Cupcake
1.6	4	Sep 2009	Donut
2.0-2.1	5,6,7	Oct 2009	Eclair
2.2	8	May 2010	Froyo
2.3	9,10	Dec 2010	Gingerbread
3.0	11,12,13	Feb 2011	Honeycomb
4.0	14,15	Oct 2011	Ice Cream Sandwich
4.1-4.3	16,17,18	Jun 2012	Jelly Bean
4.4	19,20	Sep 2013	Kit Kat
5.0	21	Jun 2014	Lollipop

❖ Android Studio:

Google's official Android IDE, in v1.0 as of November 2014

— replaces previous Eclipse-based environment
– based on IntelliJ IDEA editor; free to download and use

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❖ Set up Android Studio.

to install android studio see this link :

https://developer.android.com/studio

❖ Create an Android project:

In this part you will create a simple Android application that displays the words, "Hello World!"

1. At the Welcome Screen, click on 'Start a new Android Studio project'.
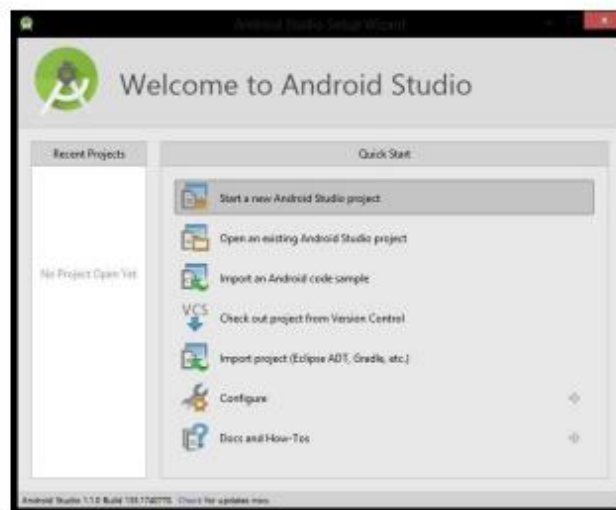
2. Enter the application name 'MyFirstApp' and note where the project is located. The AndroidStudioProjects folder is the default location for new projects.


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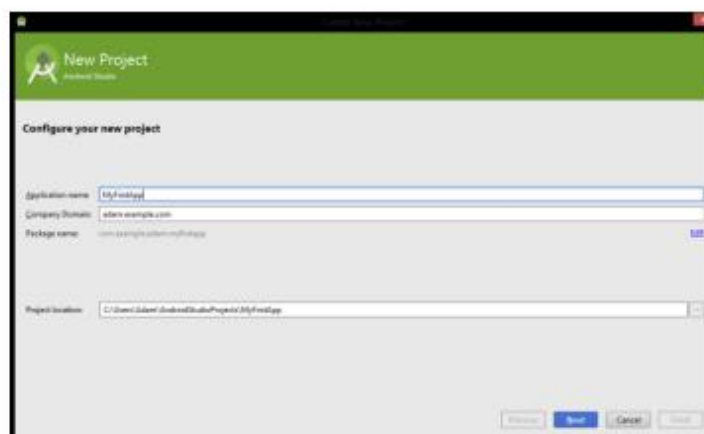
3. Select which devices you would like your app to run on. For now we will be working with 'Phone and Tablet'. Make sure to set the Minimum SDK version to API 21 for this course.
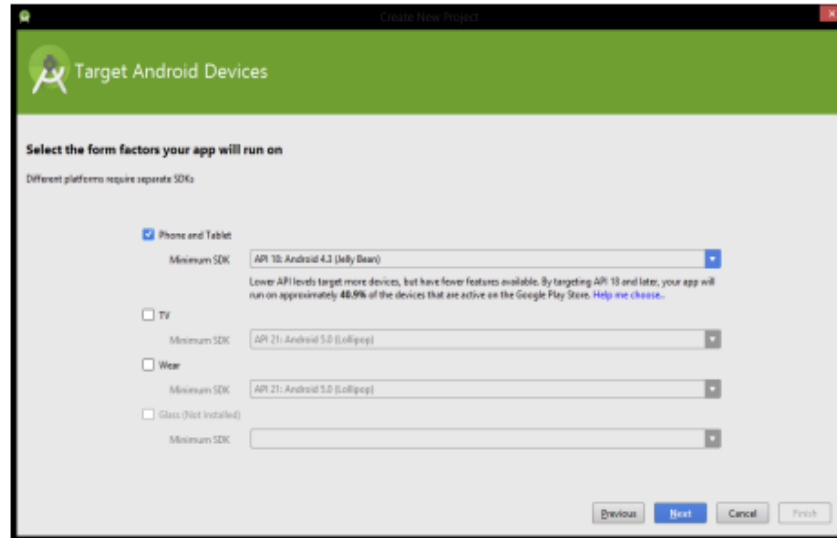
4. Select 'Blank Activity' from the 'Create New Project' dialog box and click 'Next'.
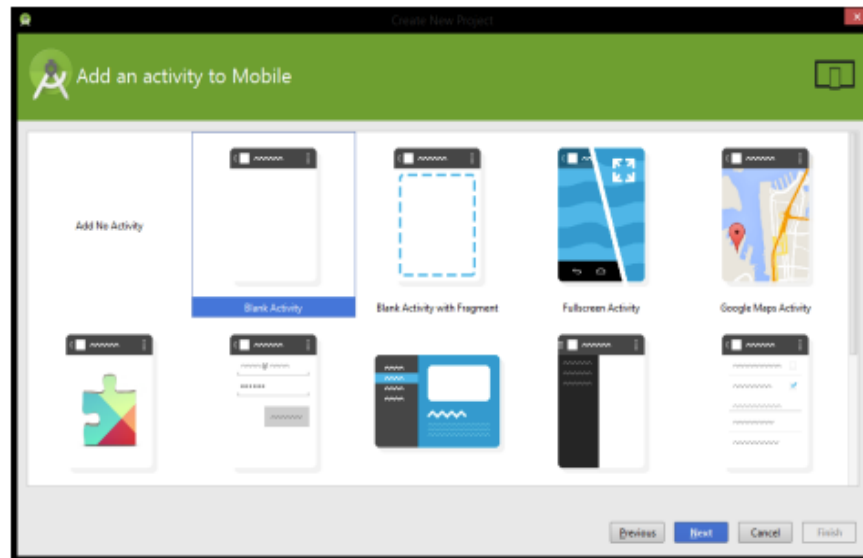

5. In the next window, leave all the settings as default, and then click Finish. Android Studio will now create the project and build it.

Building 'MyFirstApp' Gradle project info

Gradle: Build

Cancel
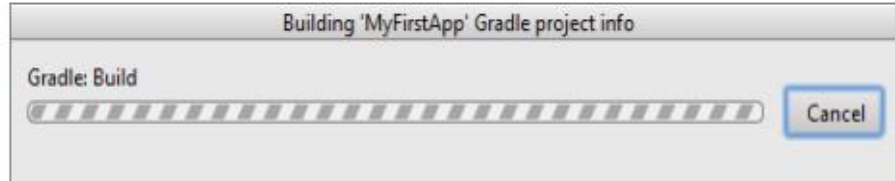
6. You may see a security alert if you are on Windows, click 'Allow access' to continue.


7. Once the Android Studio IDE fully loads, you will see the screen below. If you see text rather than the layout designer make sure the 'Design' tab is selected.
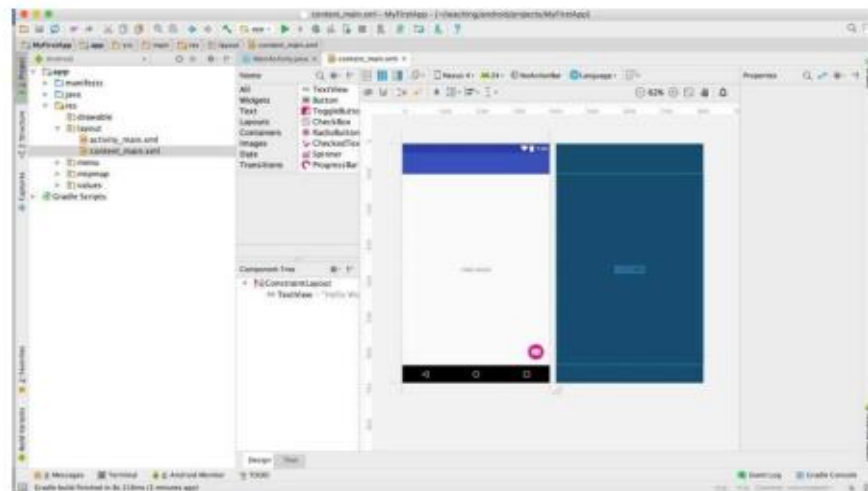

8. The opening screen is the Design View of the activity_main.xml file. You can already see the words "Hello World!" on the App's User Interface.

9. If you click on the Text tab you can see the layout file underlying the user interface.
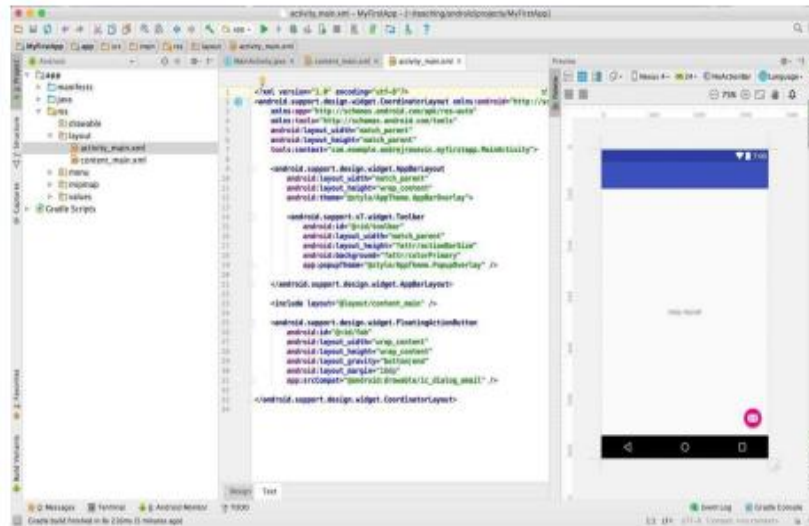

10. To view the backing code for this activity, double click on 'MainActivity' inside of the Project directory tree .This file is located in: 'java' >'com.example.<user_name>.myfirstapp' > 'MainActivity'.

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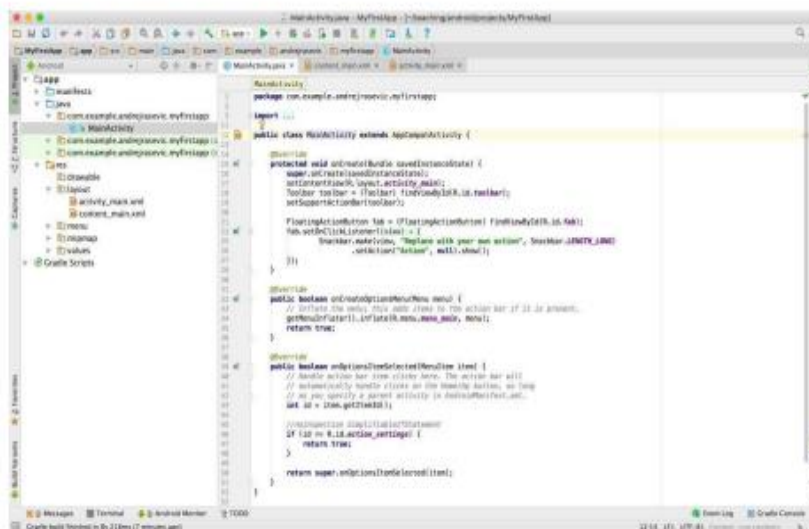
❖ Using the Emulator:

In this part you will learn how to set up and use the Android Emulator.

1. First start up the Android Virtual Device Manager. You can do that by selecting Tools > Android > AVD Manager from the Android Studio menu bar.
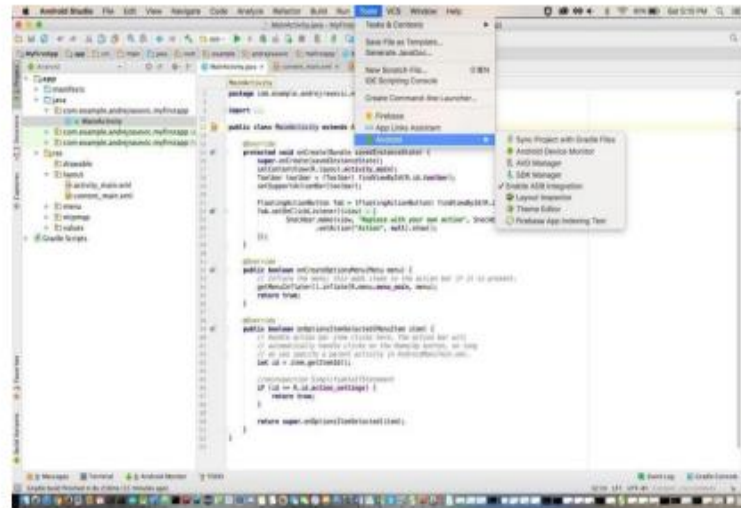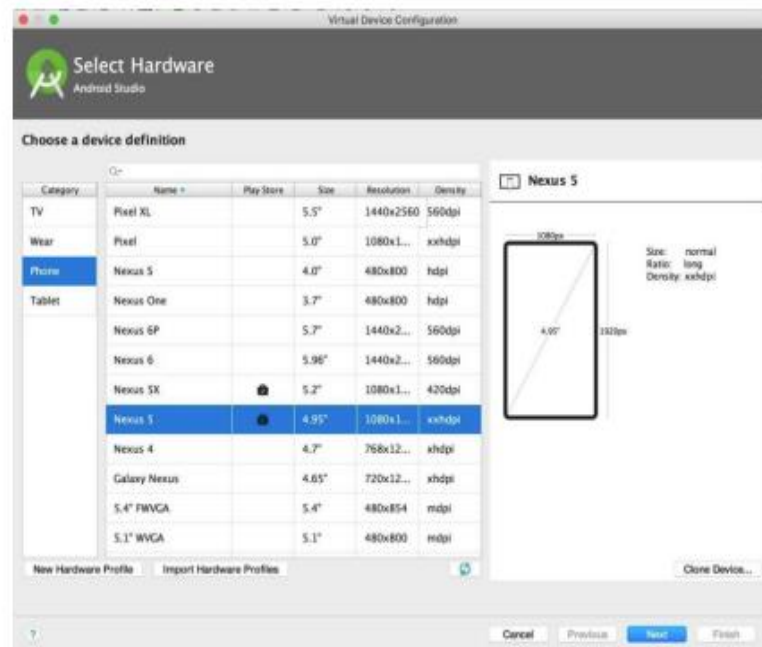

2. A new dialog box will pop up.

3. Click "Create Virtual Device" to create a new Android Virtual Device (AVD).

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4. Another dialog box will pop up displaying various pre-made AVD templates. Select whichever device you would like to emulate and click 'Next'. For example, select the Nexus 5.


5. Select the appropriate System Image for the virtual machine. To allow users with limited computer memory to participate, all of the class projects will be tested against API level 21. If you haven't downloaded that already, make sure to download it now, by clicking on the "Download" link.

6. Once the Download is finished, click 'Finish'.
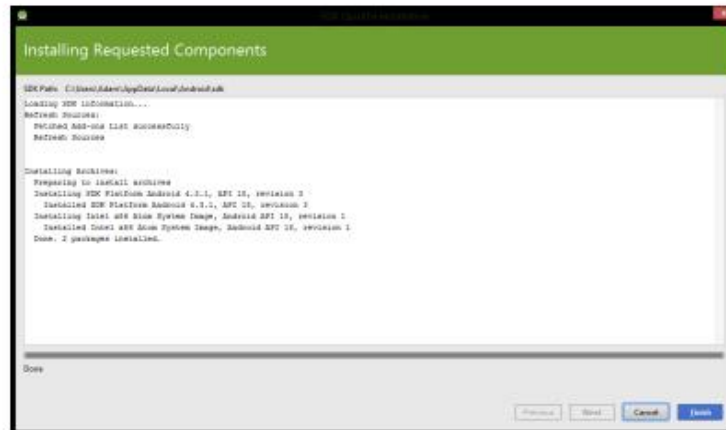
7. Click 'Next' once you have returned to the previous screen.
8. You can keep all of the default selections in the next screen and hit 'Finish'.
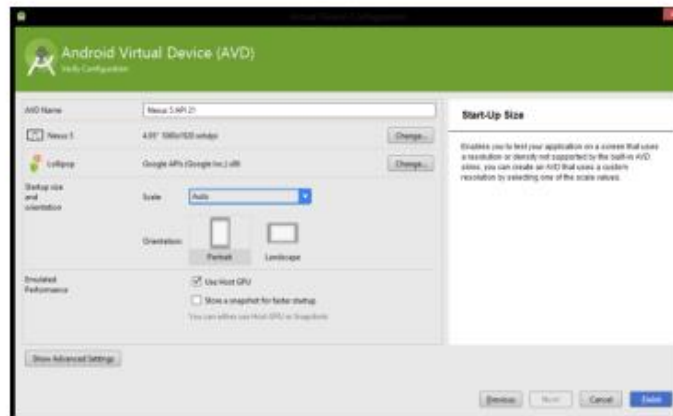
9. Now click on the green 'Play' icon to start the emulator, after clicking on it you can close the Android Virtual Device Manager.

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10. As the emulator starts up, you will see a progress dialog appear in Android Studio.
11. Next, the emulator will appear and start its boot sequence.

After the device has booted, the emulator will be ready for user interaction
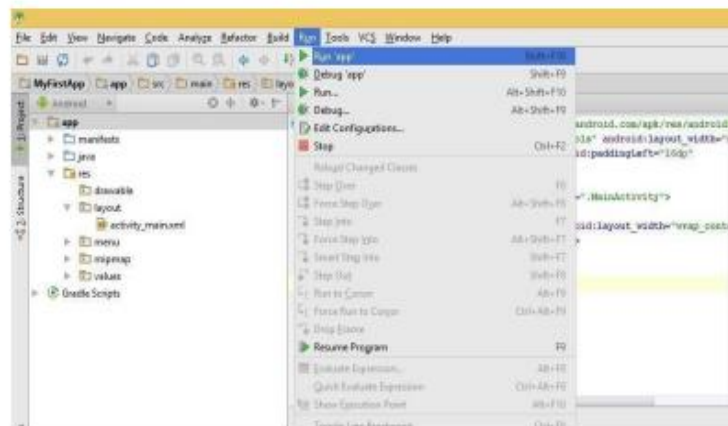
❖ *Running Your First App :*

In this part you will learn how to run the application you created in Part 2 in the Android Emulator.

1. There are two ways to run the app.

<u>Method 1</u>: Return to Android Studio and simply click on the "Run 'app'" Button (Shortcut: Windows - Shift + F10, Mac - Ctrl + R)

<u>Method 2:</u> Return to Android Studio and select Run > Run 'app'.

2. Next a window will pop-up to ask you to select which of your pre-configured AVD devices You would like to run the app on. If you do not have the correct SDK installed on your AVD for your app you will be prompted to install it.

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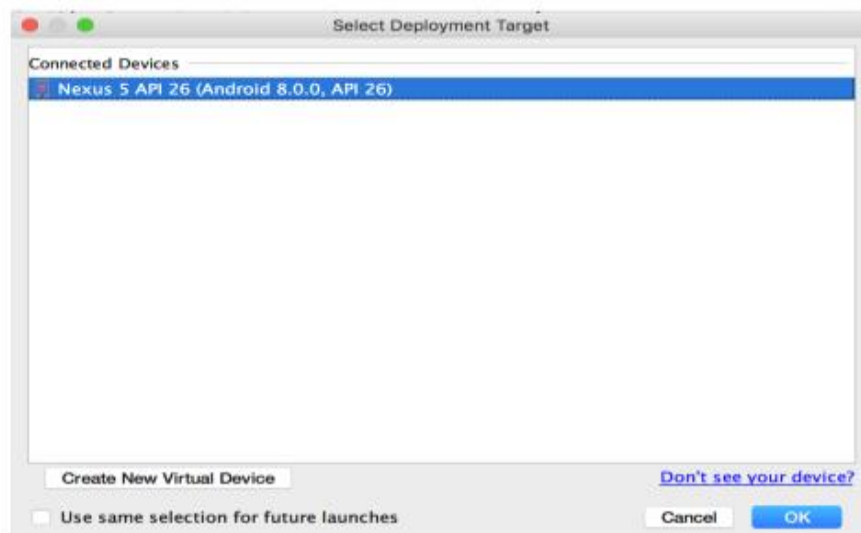
3. Return to your Emulator instance. If necessary, drag the lock icon to unlock your device.

4. You should now see your application, running in the Android Emulator.

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