DUBLIN CITY UNIVERSITY
NATIONAL INSTITUTE FOR DIGITAL LEARNING
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MODULE: SDA: MOBILE APPLICATION DEVELOPMENT

PROGRAMME(S):

BSC IN INFORMATION TECHNOLOGY
HIGHER DIPLOMA IN SOFTWARE DEVELOPMENT

ASSIGNMENT 1 2018-2019

Assignment Introduction

The purpose of this assignment is fourfold:

i) to familiarise students with the Android development environment i.e. Android Studio
ii) to familiarise students with the GitHub version control system
iii) to ensure students can import the sample code into their Android Studio IDE
iv) to ensure students can install mobile applications onto their Android devices.

This is a level 8 course, so autonomy of work is not only encouraged but expected but for this **assignment only**, sharing of assignment answers and techniques is very much encouraged. This assignment strongly encourages collaboration with your fellow students and tutors. The end goal is to ensure that by mid-October, every student has a working development environment and is familiar with the provided code resources. For this reason, you are strongly encouraged to share not only your setup problems on the forum but also your troubleshooting answers and techniques. You are also actively encouraged to help other students through any setup issues they may encounter. *You will also be working with your class mates and tutors on this assignment in the SDA Workshop on the 6th of October.*

Specific Requirements

- You are expected to **review** the assignment instructions and perform additional research required to complete the application.
- You are expected to read the first four units of your notes
- You are expected to **post by 15th October** in the Assignment 1 Study Period discussion forum a post reflecting on your work so far in this course. This post will be no more than 130 words and will outline what worked/ did not work for you regarding this assignment tasks. What you liked, what you found difficult etc.
- You are expected to take screenshots of specific components of your work and paste in a word document labelled SDA_A1_2018_YourStudentName.doc.
- You are expected to make a screencast of your work, to demonstrate your understanding of the structure of a basic Android project and post it to YouTube (private channel). The process for this is described in the document "***Uploading Assignment Videos to YouTube***" which is posted to the SDA Assignment 1 Discussion Forum.

Assignment Instructions:

The instructions below detail seven tasks that you need to perform for this assignment. A marking matrix is also provided at the end of this document. For the purpose of this assignment, marks are only awarded for success, something either worked or it didn't, there is no in between. You either installed and ran the tools correctly or you didn't, you can't "half" create a virtual device. For this reason, you are strongly recommended to ensure you can carry out all the steps. They are crucial to your success in this course. Remember help is at hand, you just need to ask.

Task 1: Build and run a simple application on your device using a USB connection from Android Studio

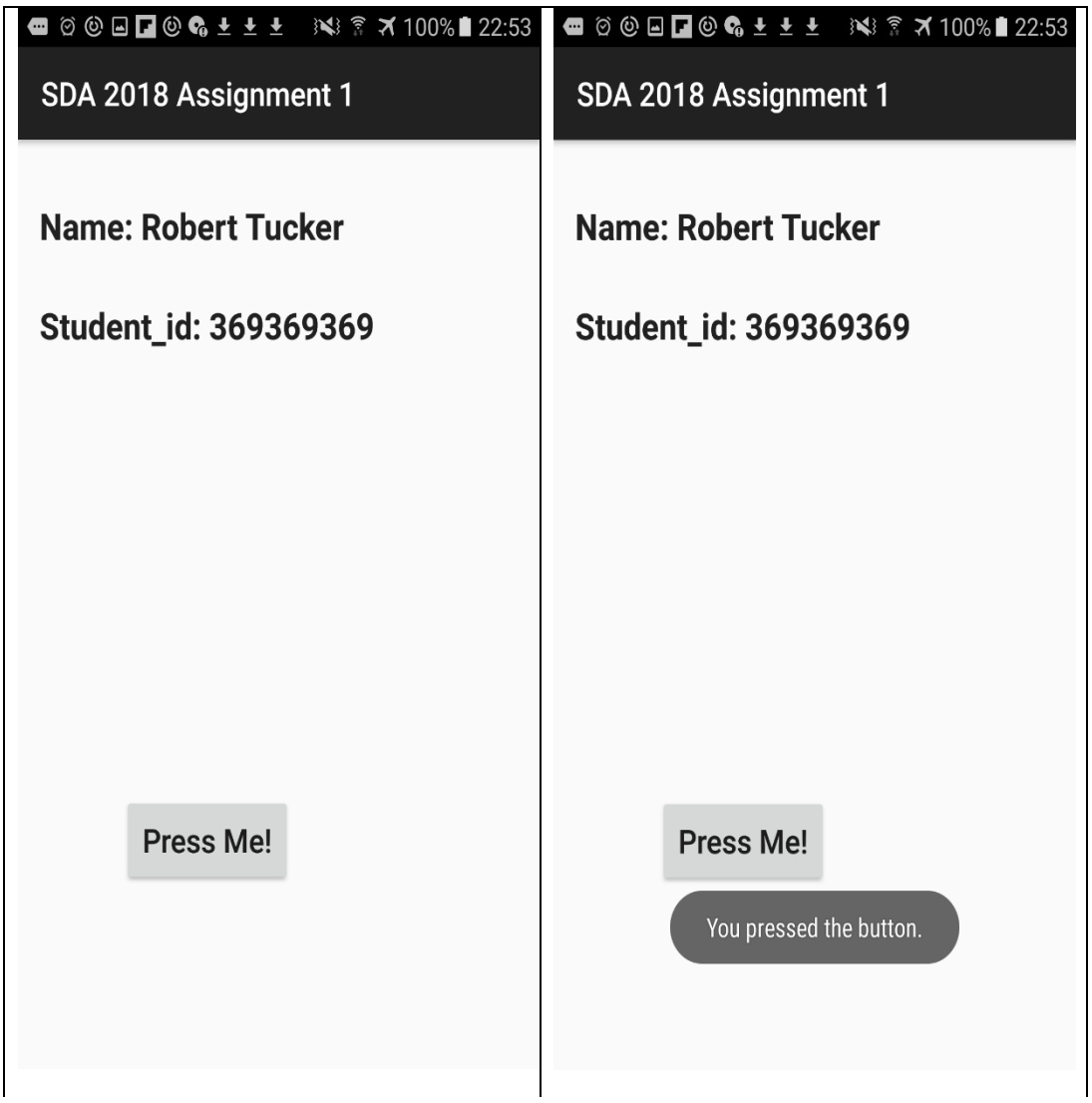


Figure 1 Screenshot of the Assign 1 Application

You will write the code to produce this application. The key features of this application are also provided below. When you launch this application on your phone, the app shown in Figure 1 appears. This app consists of only one screen. Its name is "SDA 2018 Assignment 1". This name appears on the top of the screen on the action bar.

The app contains three widgets i.e. two text fields and a button. These items are laid out in a linear format, one under the other.

The first widget is a TextView object, it contains the text value of "Name: Robert Tucker". You will replace this

name with your own name.
The second widget is also a TextView object, it contains the text value “Student ID: 369369369”. You will replace the student id with your own Student Id.
The third widget is a button object. The button object has a label of “Press Me”. Clicking on the button results in a pop-up message, (known as a Toast message in Android) appearing on your screen with the words “You pressed the button.”. The Java and XML code that produces this message is provided below.
N.B. When you create your project, you must open the layout editor and change your layout to be *RelativeLayout* as if this is done later any changes that may have been made will be lost. The *RelativeLayout* is easier to use than the default of ConstraintLayout.

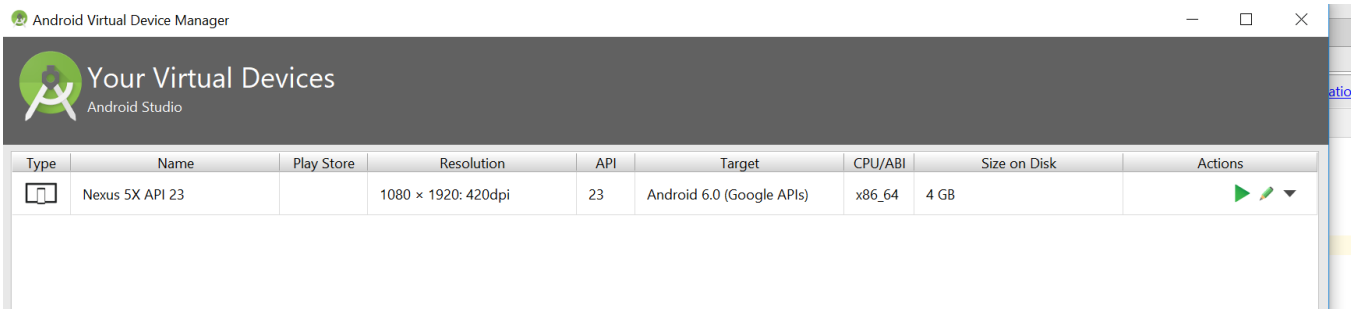
- In your **activity layout XML file**, your button element will contain the onClick attribute
```
android:onClick="showToast"
```

- In your **activity Java class**, you will have the code for the “showToast” method.
```
public void showToast(View view)
{

    CharSequence text = getResources().getString(R.string.mess_1);
    int duration = Toast.LENGTH_SHORT;

    Toast toast = Toast.makeText(this, text, duration);
    toast.show();
}
```

- In your **strings.xml** file you will have a string element with the **name** attribute that has a value of mess_toast.
```
<string name="mess_toast">You pressed the button.</string>
```

Finally, you will need to ensure that you do not hard code any of your string values, for example, the labels of your textfields and buttons. These strings values all need to be in your ***strings.xml*** file.

Task 2 Creating an Android Virtual Device



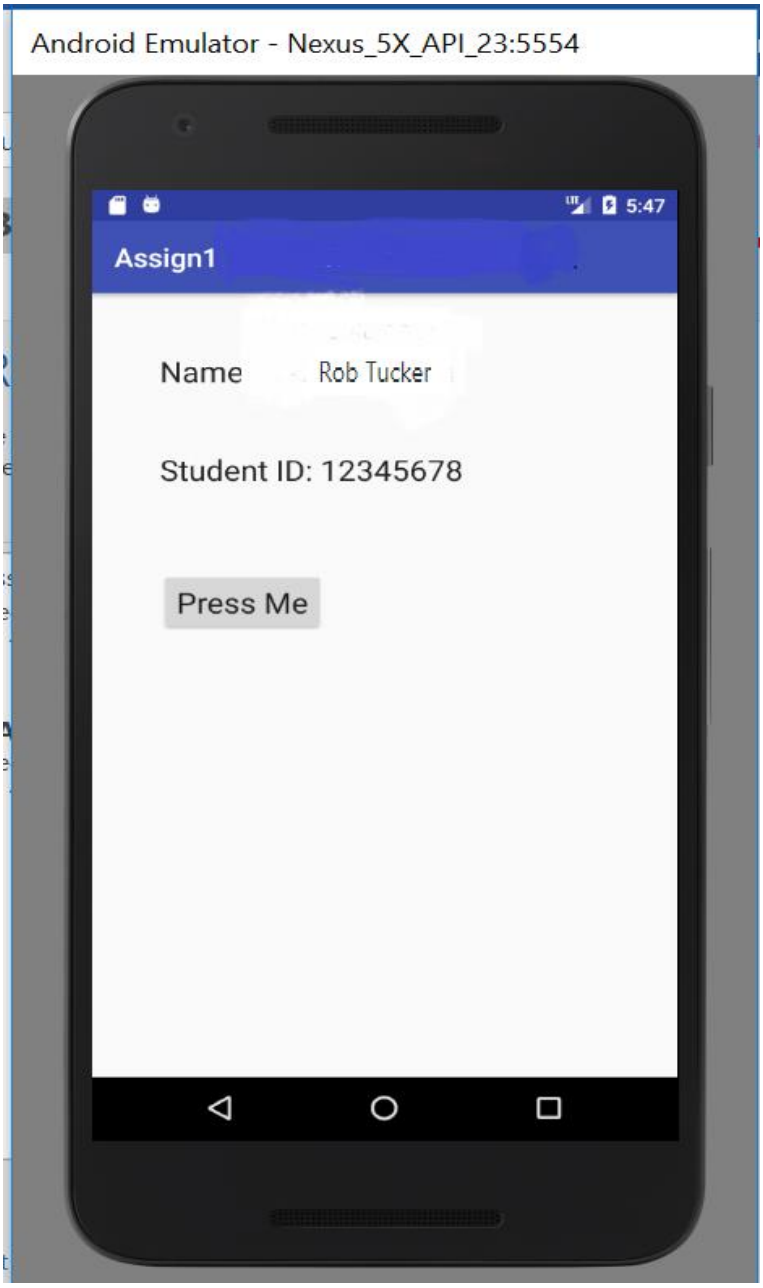


Figure 2 Screen shots depicting the creation and running of an Android Virtual Device

Using your Android Studio, create an Android Virtual Device (AVD) and run your Assign 1 app on this device. Take screenshots to prove task completion. Paste your screenshots into your SDA_A1_2018_YourStudentName.doc file. Be sure to label them and cross reference them with task number. Notice how I took two screen shots. The first screen shot (ref: Figure 2) depicts the AVD Manager tool (activated from Tools -> Android menu items) which shows that I successfully created an AVD. The second screenshot shows the Assign1 app running on this AVD.

Task 3: Install a .apk file directly on to your device.

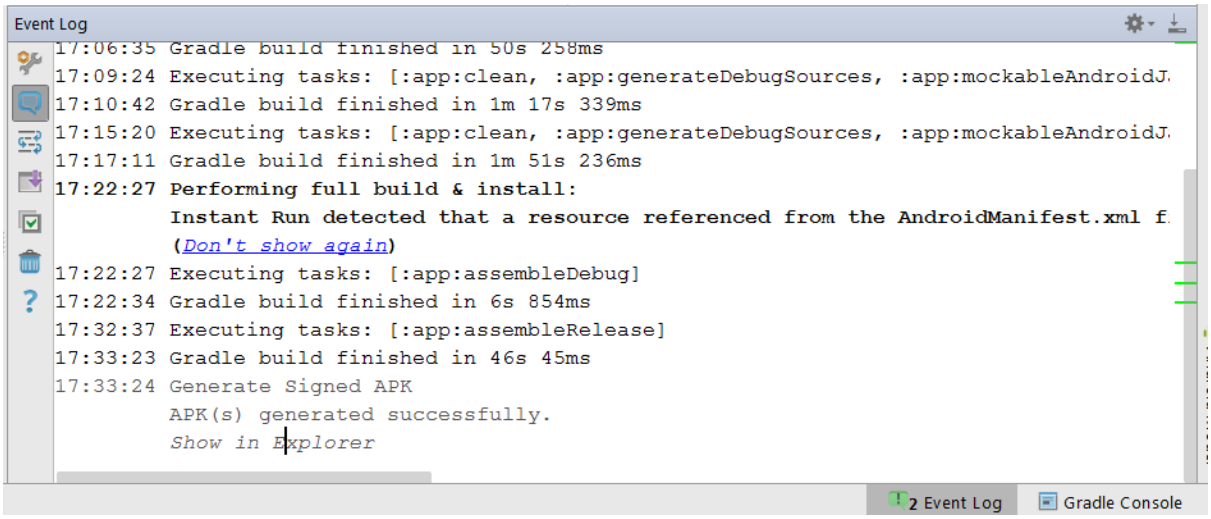


Figure 3 The log output generated in the Event Log during .apk creation.

Create a signed apk file of your Assign1 application (see unit 3). Test that this .apk file can be installed directly on your device (you will first need to first uninstall the app from your Android device). Email this apk file to robert.tucker@dcu.ie. and linda.hickey@mail.dcu.ie. Figure 3 shows the Event log output generated when a signed APK is created.

Task 4: Version Control

Check all your Assign1 source code into your GitHub account, under the assign1 folder.

Task 5: Importing Eclipse Projects and Android Studio projects into your Android Studio IDE

Import the following **two demos** into your Android Studio. DatabaseDemo from the SDA GitHub, and UIButton from the **Android_Course_Examples** directory (see Unit 3 Your Turn: Tasks to Complete). Build and run these demos on your device. **You can use Android Studio** to take screen shots of both demos' UIs and paste them into the SDA_A1_2018_YourStudentName.doc. Observe how I changed the name of the apps to be unique to me. You too, will append your name to the application name.

Task 6 Simple Debugging

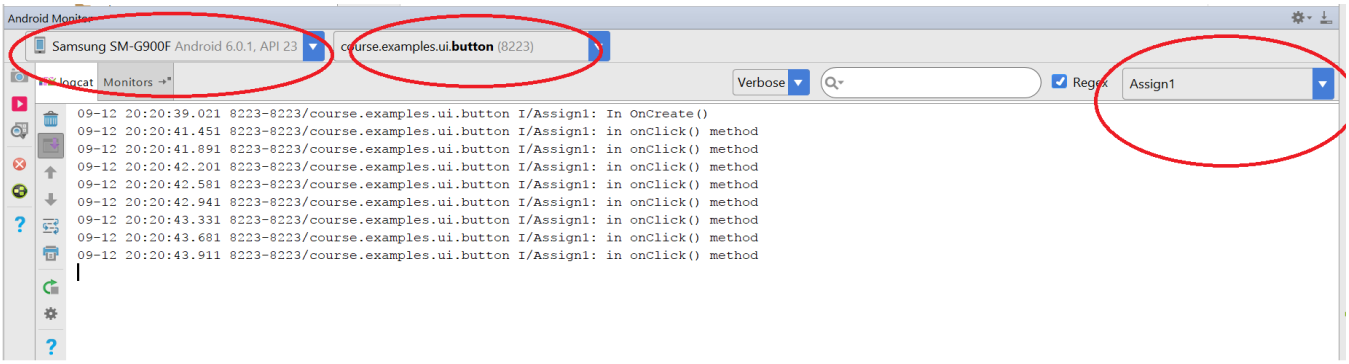


Figure 4 A screen shot of my Android Studio LogCat window, showing my log messages and log filter.

Purpose: Simple debugging:

Add three Log messages to your imported UIButton demo and run the application. You will first need to create a Log Tag called assign1. Create a filter on your LogCat Window that will only show the Log messages with this Tag string <assign1>. Take screenshots of your Android Studio Log window to prove you created a filter. Notice how my screenshot shows both my package name and phone specification, thus showing that it is unique to me. Paste your screenshots into your SDA_A1_2017_YourStudentName.doc, be sure to label them and cross reference them with the task number.

Task 7: Two minute Screen Cast of UI Button structure and functionality

Purpose: Demonstrate understanding of Android Project structure

Using the Screencast-o-matic tool available at https://screencast-o-matic.com/ (or any screen-casting tool you may own) create a screencast, maximum two minutes in length. In this screencast, demonstrate your understanding of the imported **UIButton demo**. Explain the project structure and concentrate on the following files AndroidManifest.xml (esp. activity element), ButtonActivity (what does the code do?), main.xml , strings.xml and build.gradle (Module app) (only a very basic i.e. high-level explanation of this file is expected).

We are not expecting “record studio perfection” here, if you make a mistake, acknowledge it and carry on.

N.B. Don't forget you also need to make a reflection post (by October 15th) in Assignment 1 Study Period discussion forum (see specific requirements section).

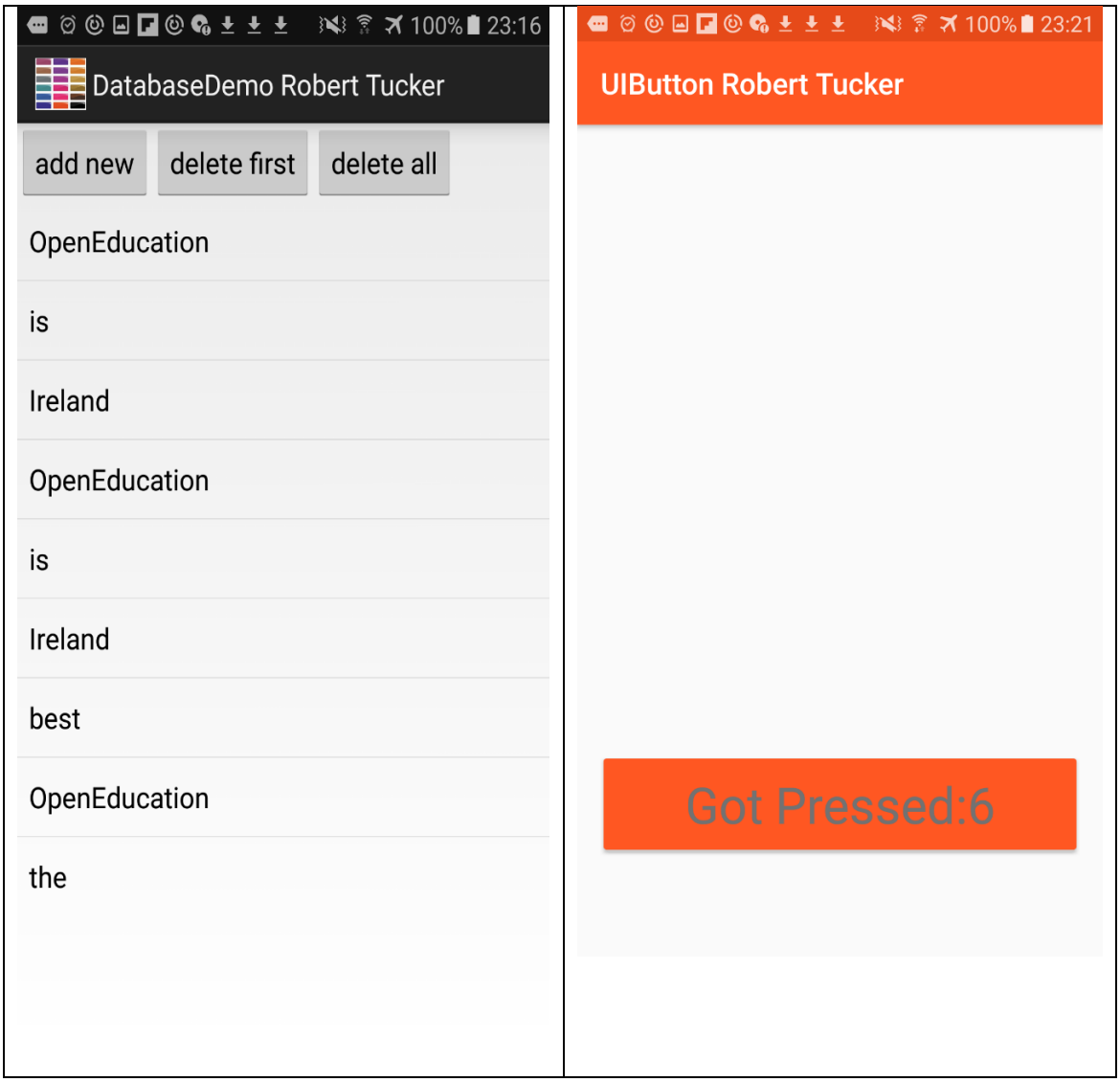


Figure 5 Screenshots of important demos.

Summary of Deliverables:

- A generated signed apk file that is emailed to robert.tucker@dcu.ie and linda.hickey@dcu.ie
- A reflective post in the Assignment 1: Study Period discussion forum before 15th October.
- **A zip file that contains**
    - your IDE project, with all your files i.e. all class and xml files.

- a document (titled SDA_A1_2018_YourStudentName.doc, containing the requested screenshots pasted in.
  - AVD screenshot
  - Log Window screenshot
  - Database Demo screenshot
  - UI Button screenshot
- A YouTube link to .mp4 file that explains the core files in the UI Button demo

- The zip file will be submitted through Loop and all your project code should be checked into your assign1 folder in your repository on GitHub.

Marking Matrix

	Fail	Pass
Step 1 Create and run application 15%	Project not created as specified. The UI does not run and does not contain the required three UI objects	Project created as specified. Runs correctly on tutor's phone. The project contains no hard-coded text strings in the layout XML files
Step 2 AVD 10%	No evidence of AVD creation	Screenshots depict the creation of a AVD and its "Assign1" application. Screenshots are unique to student
Step 3 .apk creation 10%	No archive file emailed to tutor.	Archive file emailed to tutor. The .apk file runs successfully on tutor's phone
Step 4 Version Control 20%	No Github account created and no code pushed to Github account	Account created on Github and all the code submitted
Step5 Import different projects 10%	No evidence of a successful import of the two specified projects	Screenshots depict a successful load and run of the two specified projects.
Step 6: Simple Debugging 10%	No evidence of Log code added to file and no evidence of creation of Log filter	Log code added to file and Log filter created with Log messages being displayed in LogCat Window
Step 7: Screencast 10%	No screencast provided or screencast created but expected files not discussed	Student discusses ALL the expected files and displays a competence in relation to their functionality
Forum post 10%	No post in the forum	As specified a reflective post detailing your experience setting up the Android environment etc
Simple task of showing current status during the	Insuffcient progress in setup, understanding or participation to complete Assignment 1	Task shows setup and understanding sufficiently well progressed to complete Assignment 1

workshop **5%**		