**Lab Assignment #3**

Purpose: The purpose of this lab assignment is to:

1. Develop Android Apps that contain Graphics and Animations
2. Practice the use of frame-by-frame animations
3. Practice the use of tweened animations

References: Textbook, ppt slides, class examples, and Android documentation (https://developer.android.com/guide/topics/graphics/overview.html, <http://developer.android.com/reference/android/view/KeyEvent.html>, https://material.io/icons/#ic\_keyboard\_arrow\_down). This material provides the necessary information that you need to complete the exercises.

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Start a new Android Application and **name it according to rules given in lab Assignment 1**.

**Exercise 1**

Create an activity that allows the user to draw continuous horizontal or vertical lines, starting from a given position, using up, down, left, and right **keys of Android keypad** as well as **image buttons in UI**, as shown in the picture below. Use a Canvas object to implement the drawings.

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Allow the user to choose *colors* and the *thickness* of lines. Allow the user to *clear* the drawings and *restart*. Use code from SimpleGraphics example from lecture 5 examples and my video.

The image buttons for arrow keys are provided on eCentennial.

(6 marks)

**Exercise 2**

In this exercise you will modify an existed view by adding a new attribute. Extend the **TextView** class. Add an attribute *longDate* to show a date in long format. Use *SimpleDateFormat* and *Calendar* classes to format the long date. This exercise is similar to ModifiedViewExample from lecture 5.

(3 marks)

**Exercise 3**

In this exercise you will create a tweened animation similar to TweenActivity from Lecture 6 examples (AnimationsExample). Create an application to simulate the solar system. Display a png image of the sun and the earth image slightly above the sun image. Apply the necessary transformations (*rotate*, *scale*, *translate*) to make the earth revolve nicely around the sun. Define tweening transformations as XML resource files.

(1 marks)

**Evaluation:**

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| **Functionalities**:  All three exercises (all working, proper naming of activities, variables, and methods. Provide comments).  Provide explanation when asked during the demonstration of the app. | 50% |
| **Event Handling** (proper event handlers) | 25% |
| **UI friendliness** (proper layout, controls, styles, themes, graphics, images) | 15% |
| **Declaring resources** in proper resource files | 5% |
| **Innovative features** | 5% |
| **Total** | **100%** |