

CMSC436: Fall 2013 – Week 9 Lab

Objectives:

Familiarize yourself with Graphics and Animation. Create an application that draws Graphics to the display and allows the user to manipulate them.

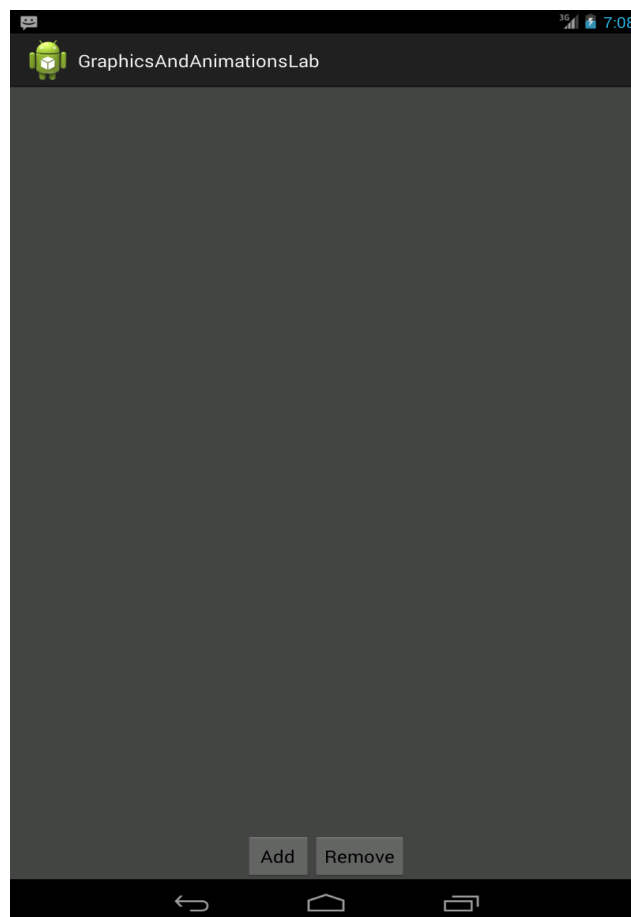
Once you've completed this lab you should have a better understanding of Graphics and Animation.

Overview:

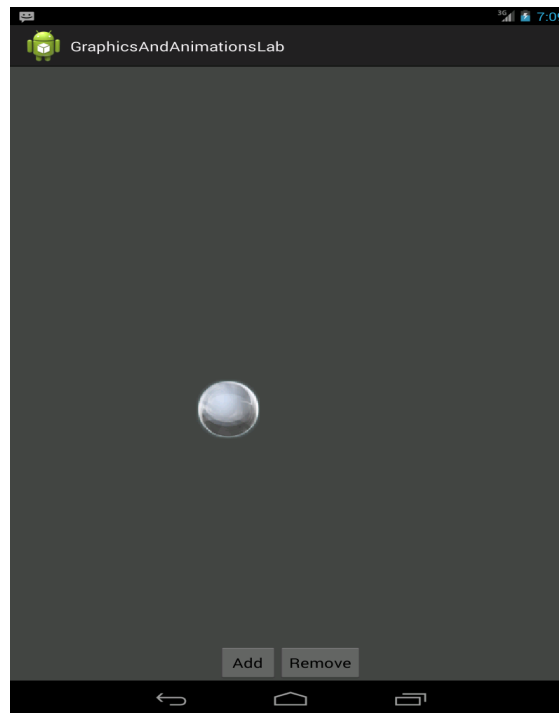
This lab has one part.

Part 1: Graphics and Animation

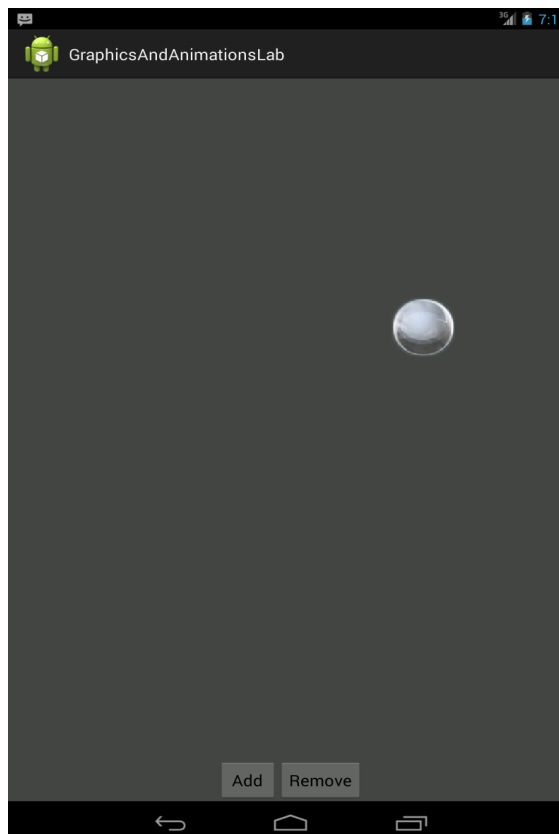
In this part, you will create an application that displays, animates and manipulates Bubbles. The application's UI will have a main display area with two Buttons labeled "Add" and "Remove."



When the “Add” button is pressed, one new bubble should appear on the display. The bubble should then begin to move around the screen. The Bubble’s initial location, size, direction and speed should be randomized.



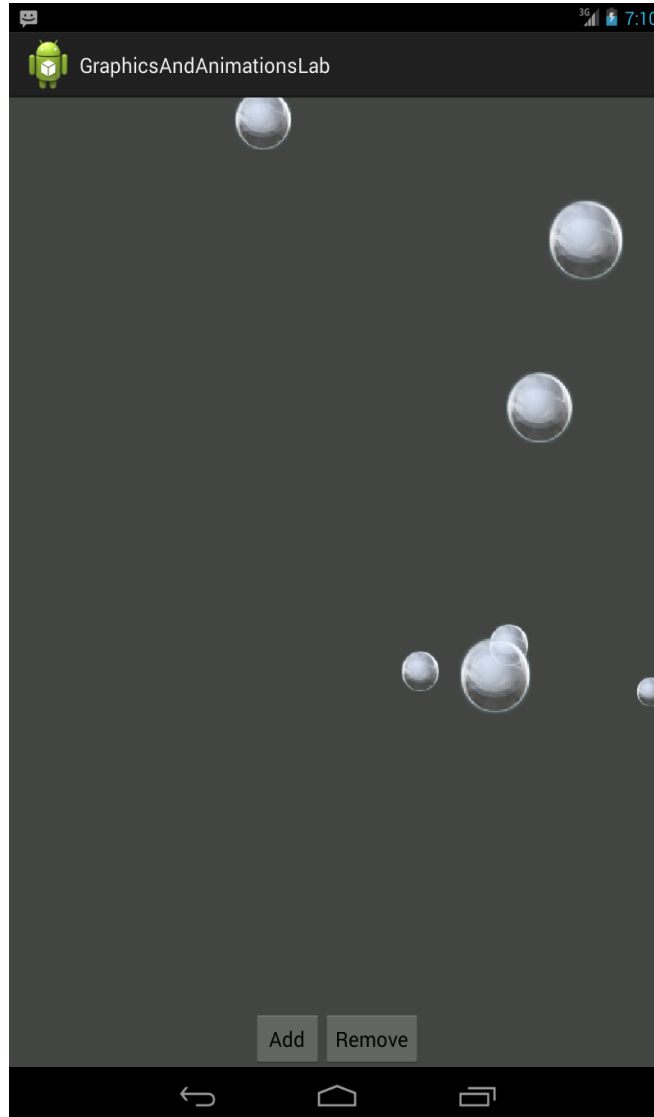
Assuming the Bubble’s direction is up and to the right, the Bubble shown above might be in the following location after a couple seconds.



When the “Remove” button is pressed, the application will get rid of the most recently added bubble that is still on the screen.

If there are no Bubbles to remove, then the application should disable the “Remove” button until at least one Bubble has been added.

Here is a screenshot after a number of Bubbles have been added.



Tips:

You should create a new View to handle Bubbles. The movement and removing bubbles should be handled from this main view.

You also need to track the Bubbles that are on screen. When a Bubble goes completely off screen, you should not perform movement calculations on it and you should not consider it for removal when the remove Button is pressed.

When bubbles are created, their locations, size, direction and acceleration are randomized. You should determine reasonable bounds on these values, so that, for instance, bubbles aren't too large or small,

In addition, when a view has changed, you must notify the system that it has changed, otherwise it will not be redrawn.

Implementation Notes:

1. Download the application skeleton files from the Lectures & Labs web page and import them into your IDE.
1. In BubbleActivity.java, implement:
 - a) **public void** onCreate(Bundle savedInstanceState)
 - Implement click listeners handlers for “Add” and “Remove” buttons
 - b) **class** BubbleView **extends** View
 - In this class, you should implement your functions to control movement of bubbles (e.g. when to move, when to stop etc.) as well as to check if the bubbles are out of screen.
 - You also should use a “ScheduledExecutorService” to control the bubbles' speed (e.g. move every 15 miliseconds)

Deliverables: Your source code project