CMPE 160.01: Introduction to Object Oriented Programming

PS7: Graphics Library: StdDraw

15/04/2022

1 Bouncing Ball:

We will install the graphics library and make our first example. We will see the bouncing ball example:

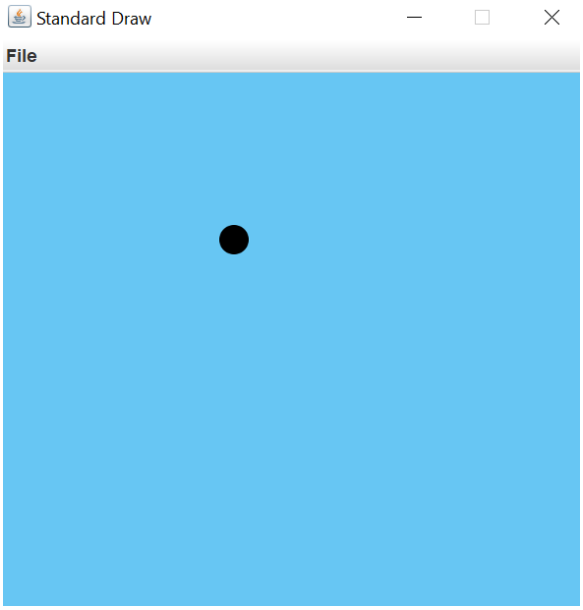

Figure 1: Bouncing ball example

Original code from StdDraw examples is as follows: You can see the animation and code from the notion site.

```
/**
 * Program animates a 2D bouncing ball
 * @author Sedgewick, Wayne
 */
public class AppGUI_10_AnimationBouncingBall {
   public static void main(String[] args) {
```

```
        StdDraw.setCanvasSize(400, 400); // set the size of the drawing canvas
        StdDraw.setXscale(-1.0, 1.0); // set the scale of the coordinate
            system
        StdDraw.setYscale(-1.0, 1.0);
        StdDraw.enableDoubleBuffering(); // Use for faster animations

        int pauseDuration = 15; // pause duration in milliseconds

        double position_x = 0.480, position_y = 0.860; // initial (x,y) ball
            position
        double velocity_x = 0.015, velocity_y = 0.017; // initial velocity
            components
        double radius = 0.05; // radius of the ball

        while (true) { // main animation loop
           // bounce off wall according to law of elastic collision
           if (Math.abs(position_x + velocity_x) > 1.0 - radius)
              velocity_x = -velocity_x;
           if (Math.abs(position_y + velocity_y) > 1.0 - radius)
              velocity_y = -velocity_y;

           position_x = position_x + velocity_x; // update positions
           position_y = position_y + velocity_y;

           StdDraw.clear(StdDraw.WHITE); // clear the background
           StdDraw.setPenColor(StdDraw.BLACK); // draw ball on the screen
           StdDraw.filledCircle(position_x, position_y, radius);
           StdDraw.show(); // show the drawing on the screen
           StdDraw.pause(pauseDuration); // pause the drawing at each
               iteration
        }
     }
}
```

TODO: Create 'ball' object and convert bouncing ball code from StdDraw examples to object oriented style.

1- Ball object should have the attributes: positionx, positiony, velocityx, velocityy, color, radius.

2- Have an move method in ball class, that will update the positions and check if the collision happened. If collision happens bounce off wall according to law of elastic collision. (velocity becomes -velocity).

3- Have a draw method in ball class, that will set the pen color as the color of the ball (get from color attribute of the class) and draw a filled circle.