

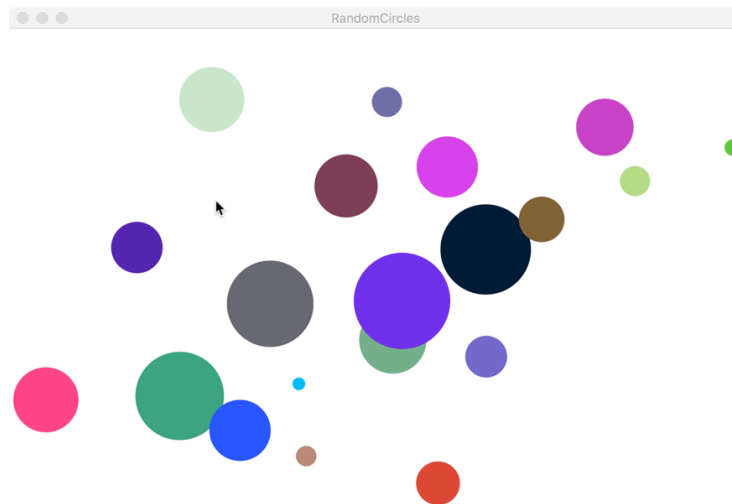
## Section Handout #3 - Animation & Events

Based on handouts by Marty Stepp and Keith Schwarz

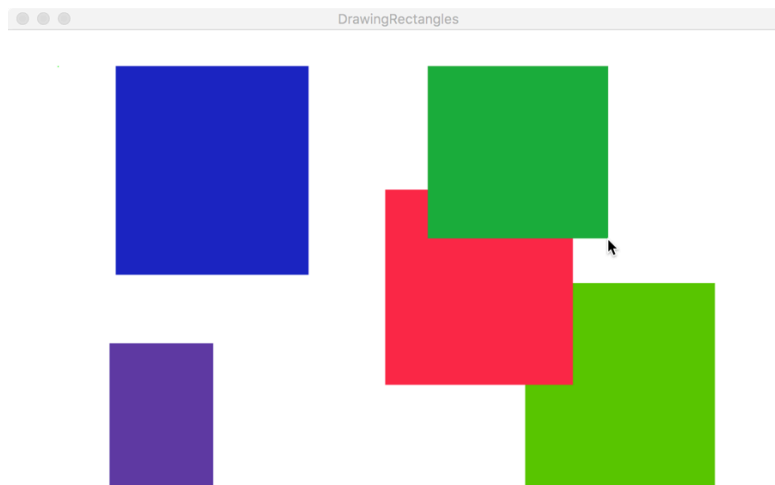
*The programs below may or may not require private instance variables. Use instance variables only when necessary!*

- 1. Random Circles.** Write a GraphicsProgram that draws a set of twenty circles with different sizes, positions, and colors. Your program should pause for 200ms in between adding each circle. Each circle should have a randomly chosen color, a randomly chosen radius between 5 and 50 pixels, and a randomly chosen position on the canvas. The entire circle must fit inside the canvas without extending past the edge.

On some runs of this program, you might not see twenty circles. Why?



- 2. Drawing Rectangles.** Write a GraphicsProgram that allows the user to create rectangles on the canvas by dragging the mouse. The user pressed down in empty space, drags, and releases to make a new rectangle. The rectangle-in-progress should stretch in size to follow the mouse. Each rectangle should be filled in with a randomly chosen color. If the user clicks an existing rectangle, it should be removed from the screen.



3. **Method Trace – Parameters and Returns.** What is the output of the program below?

```
1  import acm.program.*;
2
3  public class ParamAndReturn extends ConsoleProgram {
4      public void run() {
5          int a = 137;
6          int b = 42;
7
8          println("a = " + a);
9          method1(b);
10         println("a = " + a);
11         println("b = " + b);
12
13         a = method2(b, a + b);
14         println("a = " + a);
15         a = method2(a, b);
16         println("a = " + a);
17     }
18
19     public void method1(int a) {
20         println("a = " + a);
21         a = 160;
22     }
23
24     public int method2(int c, int b) {
25         int d = b - c;
26         println("d = " + d);
27         return d % 10;
28     }
29 }
```