COS126 NestedCircles.java (§2.3 Recursion)

```
 1 /*****************************************************************************
 2   * Draws an N-level set of nested circles in random colors.
 3   * Usage:         java NestedCircles N
 4   * Dependencies: StdDraw.java
 5   *****************************************************************************/
 6 public class NestedCircles {
 7
 8     // draw a circle with some embellishments
 9     // the center is (x, y) and the radius is r
10     public static void fancyCircle(double x, double y, double r) {
11         // use one of two color pairs at random
12         double randomBit = (int)(Math.random()*2); // equally likely 0 or 1
13         // this is the colour that will fill the circle
14         if (randomBit == 0)
15             StdDraw.setPenColor(StdDraw.CYAN);
16         else
17             StdDraw.setPenColor(StdDraw.ORANGE);
18         StdDraw.filledCircle(x, y, r);
19         // this is the colour for the circle's border
20         if (randomBit == 0)
21             StdDraw.setPenColor(StdDraw.BLUE);
22         else
23             StdDraw.setPenColor(StdDraw.RED);
24         StdDraw.circle(x, y, r);
25     }
26
27     // draw an order-n nested circle, centred on (x, y) with radius r
28     public static void draw(int n, double x, double y, double r) {
29         if (n==0) return;
30         fancyCircle(x, y, r);
31
32         double halfRadius = r/2;
33         // recursively draw two nested circles of order n-1
34         draw(n-1, x - halfRadius, y, halfRadius);
35         draw(n-1, x + halfRadius, y, halfRadius);
36     }
37
38     // read in a command-line argument N and plot an order-N circle
39     public static void main(String[] args) {
40         int N = Integer.parseInt(args[0]);
41         double x = 0.5, y = 0.5;        // biggest circle centred at (0.5, 0.5)
42         draw(N, x, y, 0.5);             // radius fills up [0,1] x [0,1] view
43     }
44 }
```