COS126 NestedCircles.java (§2.3 Recursion)

```java
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 color 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 color 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  }
```