

CSE 121: Section 5 - Nested For-Loops, Random, Math

1. Math Tracing

Trace through the code below to determine the value of each variable at the given points. Point A has been completed for you.

```
int var1 = 20;
double var2 = 19.25;
//Point A

var1 = (int) Math.round(var2);
var2 = Math.ceil(var2);
//Point B

var1 -= 18;
var2 -= (var1 * 4);
var1 = (int) Math.sqrt(var2);
//Point C

var1 *= -4;
var2 /= 4;
var2 = Math.abs(var2 * var1);
var1 = (int) var2;
var2--;
//Point D
```

Point A	var1	20
	var2	19.25
Point B	var1	19
	var2	20.0
Point C	var1	4
	var2	16.0
Point D	var1	64
	var2	63.0

2. Random Ranges

For each of the statements below, determine the range of values that could be output by the random function call. Write your answer as the lowest and highest possible value (both inclusively). You may assume that the `Random` variable, `rand`, has already been created.

	Minimum Possible Value	Maximum Possible Value
<code>rand.nextInt(10);</code>	<u>0</u>	<u>9</u>
<code>rand.nextInt(8) + 3;</code>	<u>3</u>	<u>10</u>
<code>rand.nextInt(21);</code>	<u>0</u>	<u>20</u>
<code>rand.nextInt(1);</code>	<u>0</u>	<u>0</u>
<code>rand.nextInt(3, 9);</code>	<u>3</u>	<u>8</u>
<code>rand.nextInt(2, 6) - 4;</code>	<u>-2</u>	<u>1</u>

3. Entirely Random

Write a program that randomly prints between **0 and 10 lines of output**. On each line of output, there should be between **0 and 10 (decided randomly)** smile emoticons “:-)”.

For example, you might have output like this:

```
:-) :-) :-) :-) :-)
:-) :-) :-) :-) :-) :-) :-) :-) :-) :-)
:-) :-) :-)
:-) :-) :-) :-) :-) :-) :-)
:-) :-) :-)
:-) :-) :-) :-) :-) :-)
:-) :-) :-) :-) :-)
```

Write your code below. Pay special attention to the bounds of your random number generation. **You should only create a single Random object** in the program.

```
public static void main(String[] args) {
    Random rand = new Random();

    int loopCount = rand.nextInt(0,11);
    for (int i = 0; i < loopCount; i++) {
        int smileCount = rand.nextInt(0,11);
        for (int j = 0; j < smileCount; j++) {
            System.out.print(":-)");
        }
        System.out.println();
    }
}
```