CS 101 -- Section 4 -- *Variables and Loops in Processing*

In the past week, we have learned about several new capabilities in programming with processing - variables and for-loops. These concepts are key both to programming in processing, and programming in-general. In this section, you will work on several problems and exercises to reinforce these concepts.

(1) Below are several variable declarations in processing. Each of the declarations uses mathematical expressions to determine the value that the variable will remember. Determine what value will be in each variable

A.
```
int big_num = 8 / 4 + 2 - 10 + 100;
```

B.
```
int coordinate = (2 - (6 + 4) * 2 ) / 2 + 3;
```

C.
```
int medium_num = big_num * 10 * 4 + 2 / 4;
```

D.
```
int coord2 = coordinate + big_num - medium_num * 2;
```

(2) Below are a few small programs that use variables. For each one, draw a picture with pen/pencil/marker to determine what the canvas will look like, and indicate what color the various parts of the canvas will be. After doing this, you can try running the code to see if you were correct!

A.
```
size(300, 300);
int valueA = 250;
rect(25, 25, valueA, valueA);
int valueB = valueA / 5;
valueB = valueB * 5 + 50;
ellipse(150, 150, valueB, valueA);
```

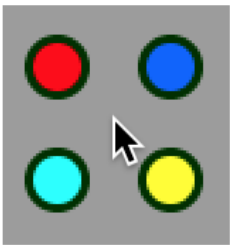
B.

```
size(400, 300);
int valueA = 20;
rect(valueA * 2, valueA * 5, 320, 100);
rect(150, 40, valueA * 5, valueA * 11);
int x = valueA - 10;
ellipse(x * 20, x * 15, 40, 40);
```

C.

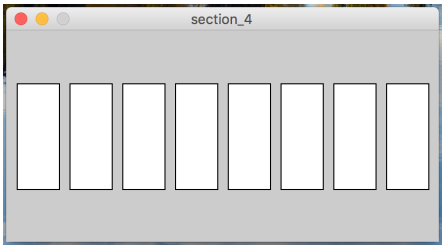
```
size(300, 300);
int a = 10;
int b = 3;
int c = 25;
int location = a * b * 5;
ellipse(location, location, 200, 200);
line(c, c, c * 11, c * 11);
line(c, c * 11, c * 11, c);
```

(3) In this problem, you will write a processing program that uses your mouse position. You should write a program that draws four circles around your mouse, as shown in the picture to the right. The circles should follow your mouse around the canvas



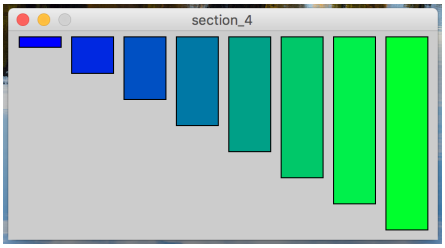
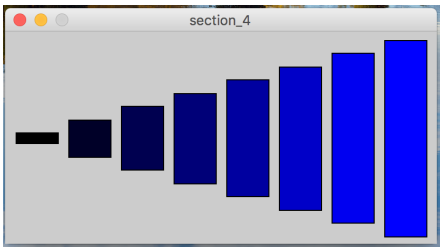
(4)

A. Write a processing program that looks like the processing canvas to the right. You should one write one **rect();** function. Use a for-loop to repeat the shape.



B. Modify the program from part A to make the canvas look like the canvas on the right. Again, you can only use one call to **rect();**, and should use a loop.

C. Modify the program from part A to make the canvas look like the canvas on the right. Same rules as before



D. Same deal...