Practice Midterm 1 Answers
Chapters 1 - 3

You have 50 minutes to work on this exam. Answer each question to the best of your ability. If you are stumped, or don't know how to write a specific piece of code, use comments, or sudo code, to describe the process or steps necessary to writing the program. As a suggestion, make tables to keep track of the variables in questions one and two if necessary.

Good Luck ☺

1. What is the output of the following program?

```
public class practiceMidtermProblem1 {
	public static final int SIZE = 5;
	public static void main(String[] args) {
		for(int line = 1; line <= SIZE; line++) {
			for(int i = 1; i <= SIZE - line; i++) {
				System.out.print(i);
			}
			System.out.print("-");
			for(int j = SIZE - line; j >= 1; j--) {
				System.out.print(j);
			}
			System.out.println();
		}
	}
}
```

Output:

```
1234-4321
123-321
12-21
1-1
-
```

2. What is the output of the following program?

```
public class MixedNumberSalad {
    public static void main(String[] args) {
        int x = 4;
        int eight = 2;
        int one = 8;
        String y = "three";
        String z = "7";
        String ten = "one";

        addFour(x, one);
        subtractFive(ten, y, z);
        String four = getFive(z, x);
        System.out.print(four);
    }

    public static void addFour(int eight, int x) {
        System.out.println(x - eight + 10);
    }

    public static void subtractFive(String eight, String four, String one) {
        System.out.print(four + " " + eight + " " + one + " ");
    }

    public static String getFive(String x, int z) {
        z = z + 10;
        return "x + z";
    }
}
```

Output:

```
14
three one 7 x + z
```

3. Write a program to produce the following pattern. Use a public final static int SIZE; to determine the size of the pattern that needs to be generated. Below are the outputs for sizes 4 and 5:

```
Size 4                                    Size 5
////////////********\\\\\\\\\\\\          ////////////////********\\\\\\\\\\\\\\\\
////////****************\\\\\\\\          ////////////****************\\\\\\\\\\\\
////************************\\\\          ////////************************\\\\\\\\
********************************          ////********************************\\\\
                                          ****************************************
```

Write out the whole program code, including the class name and main method.

```
public class SlashesPattern {
        // The constant size that can be modified to produce different sized patterns
        public static final int SIZE = 4;

        public static void main(String[] args) {
                // Ask yourself: What is changing? What's the pattern?
                //
                // We want to print a certain amount of slashes, stars, and backslashes
                // based on the line number, according on the following equations:
                // /: ((SIZE*4) - (line*4))
                // *: (line*8)
                // \: ((SIZE*4) - (line*4))
                //
                // For the slashes, the SIZE*4 represents the initial total for that given size,
                // while the line*4 represents the number of slashes removed, based on the current
                // line number. Here is a table for reference:
                // _____________________________________________________
                // | SIZE  |  LINE  |  /  |  (SIZE*4) - (line*4)       |
                // | 4     |  1     |  12 |  (16)     - (4)       = 12 |
                // | 4     |  2     |  8  |  (16)     - (8)       = 8  |
                // | 4     |  3     |  4  |  (16)     - (12)      = 4  |
                // | 4     |  4     |  0  |  (16)     - (16)      = 0  |
                // +---------------------------------------------------+


                // Create SIZE lines
                // For each of the lines
                for(int line = 1; line <= SIZE; line++) {

                        // Print ((SIZE*4) - (line*4)) many slashes, "/"
                        for(int slash = 1; slash <= ((SIZE*4) - (line*4)); slash++) {
                                System.out.print("/");
                        }

                        // Print (line*8) many stars, "*"
                        for(int star = 1; star <= (line*8); star++) {
                                System.out.print("*");
                        }

                        // Print ((SIZE*4) - (line*4)) many backslashes, "\"
                        for(int backslash = 1; backslash <= ((SIZE*4) - (line*4)); backslash++) {
                                System.out.print("\\");
                        }

                        // Go to the next line
                        System.out.println();
                }
        }
}
```