CSCI 145 -- PA 8

Arrays

Feel free to discuss and help each other out but does not imply that you can give away your code or your answers! You can work with a lab partner for this assignment. **You must always use the required template (JavaClassTemplate.java from Canvas) and output "Author: Your Name(s)" or "Modified by: Your Name(s)" for each program as applicable**.

New: You can work with a lab partner and each one must submit the same PDF file (include both names in the submission file). Each person must include a brief statement about your contribution to this assignment.

Perform as many exercises from chapter 8 of lab book as possible, but the following lab exercises must be completed. You are not required to turn in written answers to various questions, but it is very helpful in understanding important concepts. You might see those questions on quizzes and exams.

- **Exercise 1** -- Tracking Sales
- **Exercise 2** -- A Shopping Cart

Exercise 3 -- Rolling Dice -- Create an application that rolls two dice (using **Die** class in the textbook, but don't modify it and don't need to include it) 1000 times, counting the number of times each sum occurs. Print the values, counts, and percentages in a reasonable format (3 column and use Value, Count, and Percentages as column headers and one digit after the decimal point for percentage). **You must use an array to keep track of the counts**. Make sure results are as expected.

Exercise 4 – Process Values in a Certain Range
Write a program that process a list of integers from input. The input begins with an integer indicating the number of integers that follows then a list of values. Then, get the two values from the input, which indicates a minimum and a maximum. Output all integers in that range and their average. You must set up and use a method that receives an int array, minimum, and maximum to output values.

Sample input/output:

```
How many values? 6<Enter>
Input 6 values: 50 20 60 140 200 75<Enter>
Input minimum and maximum: 40 100<Enter>

Values between 40 and 100: 50 60 75
Their average: 61.7
```

You can use the following array:

```
int[] userValues = new int[n];  // n is number of input values
```

Question 1: Think about the probability of getting each sum for the Rolling Dice exercise. Does your result seem reasonable? Explain.

Question 2: What are some reasons for choosing an array over an **ArrayList**?

Extra Credit: Create **Dice** class that utilizes the existing Die class (take advantage of has-a relationship) and provides operations like the Die class (i.e., you can roll dice instead of rolling one die). The constructor accepts a positive number for the number of dice. Try this new class with the rolling dice program (rolling 2 dice in exercise 3) by adding coding to perform the same task as before (generate a table with 3 columns). You would be able to create an object representing 2 dice as:

```
Dice two = new Dice(2);
```

In addition, create an object representing 3 dice below. Roll a few times and print results.

```
Dice five = new Dice(5);
```

Fill out and turn in the PA submission file for this assignment (save as PDF format).
