CSCI 145 PA __8__ Submission

Due Date:__Apr 24, 2023__ Late (date and time):_________________

Name(s):_____Ivan Leung_____ & _______________________

Exercise 1 -- need to submit source code and I/O
-- check if completely done __x__ ; otherwise, discuss issues below

Pseudocode below if applicable:

Source code below:

```
package pa8;


/*  Java Class: CSCI 145
Modified by: Ivan Leung
Class: Mon/Wed
Date: Apr 17 2023
Description:

I certify that the code below is my own work.

Exception(s): N/A

*/

//***************************************************************
//Sales.java
//
//Reads in and stores sales for each of 5 salespeople. Displays
//sales entered by salesperson id and total sales for all
salespeople.
//
//***************************************************************

import java.util.Scanner;
import java.text.DecimalFormat;

public class Sales {
    public static void main(String[] args) {
        final int SALESPEOPLE = 5;
//      int[] sales = new int[SALESPEOPLE];
        int[] sales;
        int sum, min, max, salesTarget,
totalSalesTargetPeople, totalSalesPeople;
        double mean;
        Scanner scan = new Scanner(System.in);
        DecimalFormat decimal = new DecimalFormat("#.00");

        System.out.print("Enter total number of salesperson:
");

        totalSalesPeople = scan.nextInt();

        sales = new int[totalSalesPeople];

        System.out.println();
        for (int i = 0; i < sales.length; i++) {
            System.out.print("Enter sales for salesperson " +
(i + 1) + ": ");
            sales[i] = scan.nextInt();
        }
        System.out.println("\nSalesperson Sales");
        System.out.println(" ------------------ ");

        sum = 0;
        min = sales[0];
        max = sales[0];

        for (int i = 0; i < sales.length; i++) {
            System.out.println(" " + (i + 1) + " " " +
sales[i]);
            sum += sales[i];
            if (sales[i] > max)
                max = sales[i];
            else if (sales[i] < min)
                min = sales[i];
        }
        mean = (double) sum / SALESPEOPLE;

        System.out.println("\nTotal sales: " + sum);
        System.out.println("Average sales: " +
decimal.format(mean));
        System.out.println("Maximum sales: " + max);
        System.out.println("Minimum sales: " + min);
        System.out.print("\nEnter sales target: ");
        salesTarget = scan.nextInt();
        System.out.println();

        scan.close();

        totalSalesTargetPeople = 0;

        System.out.println("\nSalesperson who hit the sales
target");
        System.out.println(" -----------------------------------
---- ");
        for (int i = 0; i < sales.length; ++i) {
            if (sales[i] >= salesTarget) {
                System.out.println("Salesperon " + (i + 1)
+ " " + sales[i]);
                ++totalSalesTargetPeople;
            }
        }
        System.out.println("Total salespeople hit the sales
tartget: " + totalSalesTargetPeople);
    }

}
```

Input/output below:

```
Enter total number of salesperson: 6

Enter sales for salesperson 1: 3829
Enter sales for salesperson 2: 8265
Enter sales for salesperson 3: 7385
Enter sales for salesperson 4: 2347
Enter sales for salesperson 5: 6589
Enter sales for salesperson 6: 4892

Salesperson Sales
 ------------------
 1 3829
 2 8265
 3 7385
 4 2347
 5 6589
 6 4892
```

```
Total sales: 33307
Average sales: 6661.40
Maximum sales: 8265
Minimum sales: 2347

Enter sales target: 4000


Salesperson who hit the sales target
 -------------------------------------
Salesperon 2 8265
Salesperon 3 7385
Salesperon 5 6589
Salesperon 6 4892
Total salespeople hit the sales tartget: 4
```

Exercise 2 -- need to submit source code and I/O
-- check if completely done __x__ ; otherwise, discuss issues below

Pseudocode below if applicable:

Source code below:

```
package pa8;

import java.text.NumberFormat;

/*  Java Class: CSCI 145
Author: Ivan Leung
Class: Mon/Wed
Date: Apr 17 2023
Description:

I certify that the code below is my own work.

Exception(s): N/A

*/

import java.util.Scanner;
```

```
public class Shopping {

    public static void main(String[] args) {
        ShoppingCart shoppingCart = new ShoppingCart();
        String itemName;
        double itemPrice;
        int itemQty;
        double totalPrice = 0;
        String continueShopping = "y";
        Scanner scan = new Scanner(System.in);
        NumberFormat currency =
NumberFormat.getCurrencyInstance();

        while(continueShopping.trim().equalsIgnoreCase("y")) {
            System.out.println("\nAdding item to the
cart...\n");
            System.out.print("What is name of the item: ");
            itemName = scan.next();
            System.out.print("How much the " + itemName + "
is? ");
            itemPrice = scan.nextDouble();
            System.out.print("How many " + itemName + " do
you want? ");
            itemQty = scan.nextInt();
            shoppingCart.addToCart(itemName, itemPrice,
itemQty);
            totalPrice += (itemPrice * itemQty);

            System.out.println(shoppingCart);
            System.out.print("Do you want to add more items
(y or n)? ");
            continueShopping = scan.next();
        }
        scan.close();
        System.out.println("\nPlease pay...");
        System.out.println("Total: " +
currency.format(totalPrice));
    }

}
```

Input/output below:

```
Adding item to the cart...

What is name of the item: T-shirt
How much the T-shirt is? 8.99
How many T-shirt do you want? 3

Shopping Cart

Item  Unit Price Quantity   Total
T-shirt    $8.99      3          $26.97

Total Price: $26.97

Do you want to add more items (y or n)? y

Adding item to the cart...

What is name of the item: Pants
How much the Pants is? 14.59
How many Pants do you want? 2

Shopping Cart

Item  Unit Price Quantity   Total
T-shirt    $8.99      3          $26.97
Pants $14.59          2          $29.18

Total Price: $56.15

Do you want to add more items (y or n)? y

Adding item to the cart...

What is name of the item: Socks
How much the Socks is? 2.99
How many Socks do you want? 10

Shopping Cart

Item  Unit Price Quantity   Total
T-shirt    $8.99      3          $26.97
Pants $14.59          2          $29.18
Socks $2.99      10         $29.90

Total Price: $86.05
```

```
Do you want to add more items (y or n)? y

Adding item to the cart...

What is name of the item: PS5
How much the PS5 is? 699.99
How many PS5 do you want? 1

Shopping Cart

Item Unit Price Quantity   Total
T-shirt    $8.99      3          $26.97
Pants $14.59          2          $29.18
Socks $2.99     10        $29.90
PS5  $699.99          1          $699.99

Total Price: $786.04

Do you want to add more items (y or n)? n

Please pay...
Total: $786.04
```

Exercise 3 -- need to submit source code and I/O
-- check if completely done __x__ ; otherwise, discuss issues below

Pseudocode below if applicable:

Source code below:

```
package pa8;

/*  Java Class: CSCI 145
Author: Ivan Leung
Class: Mon/Wed
Date: Apr 17 2023
Description:

I certify that the code below is my own work.
```

```
Exception(s): N/A

*/

import java.text.NumberFormat;

public class RollingDice {

      public static void main(String[] args) {
            Die die = new Die();
            int maxSum = 12;
            int maxRoll = 1000;
            int[] results = new int[maxSum];
            NumberFormat percent =
NumberFormat.getPercentInstance();
            percent.setMinimumFractionDigits(1);

            for (int i = 0; i < maxRoll; ++i) {
                  ++results[die.roll() + die.roll() - 1];
            }

            System.out.println("Value\tCount\tPercentages");
            for (int i = 0; i < 12; ++i) {
                  System.out.println(i + 1 + "\t" + results[i] +
"\t" + percent.format((double) results[i] / maxRoll));

            }

      }

}
```

Input/output below:

```
Value Count Percentages
1     0     0.0%
2     27    2.7%
3     49    4.9%
4     84    8.4%
5     117   11.7%
6     154   15.4%
7     153   15.3%
8     134   13.4%
9     118   11.8%
```

```
10    88    8.8%
11    48    4.8%
12    28    2.8%
```

Add more exercises as needed

Exercise 4 -- need to submit source code and I/O
-- check if completely done __x__ ; otherwise, discuss issues below

Pseudocode below if applicable:

Source code below:

```java
package pa8;

/*  Java Class: CSCI 145
Author: Ivan Leung
Class: Mon/Wed
Date: Apr 17 2023
Description:

I certify that the code below is my own work.

Exception(s): N/A

*/

import java.util.Scanner;
import java.text.DecimalFormat;

public class ProcessValues {

    public static void main(String[] args) {
        int totalVal;
        int inRangeQty;
        int[] list;
        int inRangeSum;
        int min;
        int max;
        Scanner scan = new Scanner(System.in);
        DecimalFormat decimal = new DecimalFormat("#.0");

        System.out.print("How many values? ");
        totalVal = scan.nextInt();
        list = new int[totalVal];

        System.out.print("Input " + totalVal + " values: ");
        for (int i = 0; i < totalVal; ++i) {
            list[i] = scan.nextInt();
        }

        System.out.print("Input minimum and maximum: ");
        min = scan.nextInt();
        max = scan.nextInt();
        scan.close();

        inRangeSum = 0;
        inRangeQty = 0;
        System.out.print("Values between " + min + " and " +
max + ":");
        for (int i = 0; i < totalVal; ++i) {
            if (list[i] >= min && list[i] <= max) {
                System.out.print(" " + list[i]);
                inRangeSum += list[i];
                ++inRangeQty;
            }
        }
        System.out.println("\nTheir average: " +
decimal.format((double) inRangeSum / inRangeQty));
    }

}
```

Input/output below:

```
How many values? 8
Input 8 values: 89 32 90 54 101 31 77 10
Input minimum and maximum: 32 89
Values between 32 and 89: 89 32 54 77
Their average: 63.0
```

Answer for Question 1

Yes, it is reasonable. According to the probability of rolling two dice, the middle number, 7, has the highest probability of 16.67%. Starting from the number 2 and 12, the probability increases as the number goes toward the middle number, 7. Comparing to the results of rolling two dice from exercise 3, they are very close to each other. If we roll the two dice enough time, the results will get even closer to the probability of rolling two dice.

Answer for Question 2

One important reason for choosing an array over an ArrayList is that ArrayList cannot hold primitive type while array can hold both primitive type and reference type. ArrayList also has dynamic size which we do not need for our purposes, so it is better to use array performance wise.

Extra Credit – provide if applicable

Pseudocode below if applicable:

Source code below:

```
package pa8;

public class Dice {
	private Die[] die;
	private int numberOfDie;
	private int faceValue;

	public Dice(int numberOfDie) {
		this.numberOfDie = numberOfDie;
		die = new Die[this.numberOfDie];
		for (int i = 0; i < this.numberOfDie; ++i) {
			die[i] = new Die();
		}
	}

	public int roll() {
		faceValue = 0;
		for (int i = 0; i < numberOfDie; ++i) {
			faceValue += die[i].roll();
		}
		return faceValue;
	}

	public void setFaceValue(int value) {
		faceValue = value;
```

```
    }

    public int getFaceValue() {
        return faceValue;
    }

    public String toString() {
        return Integer.toString(faceValue);
    }
}
package pa8;

/*  Java Class: CSCI 145
Author: Ivan Leung
Class: Mon/Wed
Date: Apr 17 2023
Description:

I certify that the code below is my own work.

Exception(s): N/A

*/

import java.text.NumberFormat;

public class RollingDice {

    public static void main(String[] args) {
        Dice twoDice = new Dice(2);
        Dice threeDice = new Dice(3);
        int maxSum = 12;
        int maxRoll = 1000;
        int[] results = new int[maxSum];
        NumberFormat percent = 
NumberFormat.getPercentInstance();
        percent.setMinimumFractionDigits(1);

        for (int i = 0; i < maxRoll; ++i) {
            ++results[twoDice.roll() - 1];
        }

        System.out.println("Value\tCount\tPercentages");
        for (int i = 0; i < 12; ++i) {
            System.out.println(i + 1 + "\t" + results[i] + 
"\t" + percent.format((double) results[i] / maxRoll));
```

```
        }

        System.out.println("\nRolling three dice a few
times...");
        for (int i = 0; i < 5; ++i) {
            System.out.println("Rolled " + threeDice.roll());
        }
    }

}
```

Input/output below:

```
Value Count Percentages
1     0     0.0%
2     24    2.4%
3     53    5.3%
4     88    8.8%
5     114   11.4%
6     129   12.9%
7     152   15.2%
8     166   16.6%
9     111   11.1%
10    82    8.2%
11    61    6.1%
12    20    2.0%

Rolling three dice a few times...
Rolled 9
Rolled 8
Rolled 9
Rolled 11
Rolled 10
```