[Total 15 marks]

CSCI 1100 – September 2016
Laboratory Report 3

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Please mark your lab						
T 8:30 L143	T 8:30 L134	T 8:30 L133	T 11:30 L143	T 11:30 L133	T 11:30 L142	T 2:30 L143
T 5:30 L143	T 5:30 L142	W 11:30 143	W 4:30 143			

Declaration: Please complete this declaration		
1	This document is entirely my own work. Your lab should be the efforts of your own work. However, you may need to look something up to help you or ask someone for help. If acquired help (online or with someone) you need to acknowledge this below.	Yes
2	I obtained some help to complete this document.	no
3	This document contains some material from the Internet or another document or file or program. Note, your lab should be the efforts of your own work. However, you may need to look something up to help you – you need to acknowledge this. You should not cut and paste solutions.	no

Exercise 0. (No marks) TAs please work through the following short exercise with the students at the start of the lab.

Fix the errors. In the program below you are asked to write a program that uses two variables x and y. We need to first set the value of x to 3.5, and then set the value of y to x+1. Finally, the values of both x and y will both be increased by 0.5. The program will print out the values of x and y after each (set) of assignment operation. The expected output of the program is as follows (except for the display of the decimal point):

```
x is 3.5
x and y are 3.5 and 4.5
x and y now are 4.0 and 5.0
```

Below is a sample program to do this. Identify all the errors and fix them. Make sure the program produces the expected output. Include comments to explain each error found. (Do not concern yourself with the display of the decimal points.)

```
public class PleaseFixMe {
    public static void main(String[] args) {
```

```
        double x;
        // set x to 3.5
        x = 3.5;
        System.out.println("x is now + x");

        // set y to 1 more than x
        double y;
        y = x + 1;
        System.out.println("x and y are " + x + "and" + y);

        // add 0.5 to both x and y
        x = x + 0.5;
        y = y + 0.5;
        System.out.println("x and y now are " + x+ "and" +y);
    }
}
```

Work through the solution with the students.

Exercise 1. Write a Java program that uses a Scanner object to read three double values from the keyboard and assign these values to three variables. The program then computes the average of the three variables and assigns the value to a variable called average. The program then prints the average. Test the program with two different sets of data and include the results in this report. Do not concern yourself with controlling the display of the decimal point. **[2 marks]**

Sample output:

```
Please type a value: ..
Please type a value: ..
Please type a value: ..
Average = …
```

Program:

```
/* CSCI 1100-Lab1-Exercise 1
 This program will read the input of the user and calulate the average then print it
 <Mihyar Al-Masalma> <B00759975> <10/4/2016>*/
 import java.util.Scanner; // import Scanner class
public class AverageOfThree{
        public static void main(String[] args) {
                // create an instance of the scanner class with System.in as argument
                Scanner input = new Scanner(System.in);
                // ask the user to enter the first number
                System.out.println("Please type a value: ");
                // assign the value to a variable called first
                double first = input.nextDouble();
                // ask the user to enter the second number
                System.out.println("Please type a value: ");
                // assign the value to the second variable
                double second = input.nextDouble();
                // ask the user to enter the third number
                System.out.println("Please type a value: ");
                // assign the number to the third variable
                double third = input.nextDouble();
                //define a variable average and assign the average to it
                double average = (first+second+third)/3;
                //print out the result
                System.out.println("Average = "+average);
```

```
        }
}
```
Output (2 different outputs/tests):
Please type a value:
2
Please type a value:
4
Please type a value:
6
Average = 4.0
Please type a value:
2
Please type a value:
2
Please type a value:
2
Average = 2.0

Exercise 2. Write a program that uses a Scanner object to read a value in $CA (Canadian Dollars). The program computes the equivalent amount in Yen (Japanese currency) and the equivalent in $US dollars. Google the conversion rates. The program then writes the result in the following form: **[2 marks]**

```
Please type a value in $CA: ..

..  $CA = .. Yen = .. $US
```

You need to choose whether the variables should be of type int or double. Test the program with two sets of data and include the results in this report. Do not concern yourself with controlling the display of the decimal point.

Program:
```
/* CSCI 1100-Lab1-Exercise 2
 This program will convert Canadia dollars to Yen then US dollars
 <Mihyar Al-Masalma> <B00759975> <10/4/2016>*/
 import java.util.Scanner; // import Scanner class
 public class Exchange{
        public static void main(String[] args) {
                // create an instance of the scanner class with System.in as argument
      Scanner input = new Scanner(System.in);
      // ask the user to enter the amount of money in Canadian dollars
      System.out.println("Please type a value in $CA: ");
      // assign the inserted value to a variable
      double ca = input.nextDouble();
      // calculate how much does it worth in Yen
      double yen = ca * 77.89;
      // calculate how much does it worth in US dollar
      double us = ca * 0.76;
      // print out the result
      System.out.println(ca+" $CA = "+yen+" Yen = "+us+" $US");
        }
 }
```
Output (2 different outputs/tests):
Please type a value in $CA:
10

10.0 $CA = 778.9 Yen = 7.6 $US

Please type a value in $CA:
20
20.0 $CA = 1557.8 Yen = 15.2 $US

Exercise 3. Write a program that can be used when you go out for dinner at a restaurant with friends and you need to split up the bill equally. The program uses a Scanner object to read a double value from the keyboard that represents the total of the bill. The program then reads in a double value from the keyboard that represents what tip percent you want to add (e.g., 15% of the bill is a common tip amount for good service). Finally, the program reads in an integer value that represents how people are splitting the bill plus tip. The program then computes the tip on the bill, and figures out what each person owes. **[3 marks]**

Sample output:

```
Please enter the amount of the bill $ 100
Please enter the tip percentage (e.g., .15)$ .10
Please enter the number of people dining: 4
The total of your bill plus tip is $110.0
Each person owes $27.5
```

Test the program with two sets of data and include the results in this report. Do not concern yourself with controlling the display of the decimal point.

Program:

```
/* CSCI 1100-Lab1-Exercise 3
 This program will claculate the bill at a resturant and the tipe
 and split it evenly between the people at the table
 <Mihyar Al-Masalma> <B00759975> <10/4/2016>*/
 import java.util.Scanner; // import Scanner class
 public class Restaurant{
        public static void main(String[] args) {
                // create an instance of the scanner class with System.in as argument
      Scanner input = new Scanner(System.in);
      //ask the user to enter the amount of the bill
      System.out.println("Please enter the amount of the bill $: ");
      //assign this value to a variable
      double bill = input.nextDouble();
      // ask the user to enter how much tip does he want to pay
      System.out.println("Please enter the tip percentage (e.g., .15)$: ");
      //assign the value to a variable
      double tip = input.nextDouble();
      // ask the user to enter the number of people on the table
      System.out.println("Please enter the number of people dining: ");
      // assign the value to a variable
      int people = input.nextInt();
      //calculate the total amount of the bill
      double total = (bill * tip) + bill;
      // print out the total amount of the bill
      System.out.println("The total of your bill plus tip is $"+total);
      //calculat how much should each person pay
      double each = total/people;
      // print out the amount each should pay
      System.out.println("Each person owes $"+each);
        }
```

```
}
```
Output 2 different outputs/tests):
```
Please enter the amount of the bill $:
100
Please enter the tip percentage (e.g., .15)$:
.10
Please enter the number of people dining:
4
The total of your bill plus tip is $110.0
Each person owes $27.5

Please enter the amount of the bill $:
200
Please enter the tip percentage (e.g., .15)$:
.15
Please enter the number of people dining:
5
The total of your bill plus tip is $230.0
Each person owes $46.0
```
Exercise 4. Write a program that uses a Scanner object to reads in two different numbers. Print the number that is the smallest of the two. Then multiple the smallest number by 5. Square the new smallest number and the larger number. Then print out the largest of the two numbers. See below for sample output. **[3 marks]**
```
Type the first number: 6
Type the second number: 10
The smallest number is 6.0
6.0 times 5 is 30.0
The square of 30.0 is 900.0
The square of 10.0 is 100.0
900.0 is larger than 100.0.
```
Test the program with two sets of data and include the results in this report. Do not concern yourself with controlling the display of the decimal point.
Program:
```
/* CSCI 1100-Lab1-Exercise 4
This program will take two number find the smallest then multiply it by 5
then square both numbers and print it then find the largest
 <Mihyar Al-Masalma> <B00759975> <10/4/2016>*/
 import java.util.Scanner; // import Scanner class
 public class Smallest{
          public static void main(String[] args) {
                    // create an instance of the scanner class with System.in as argument
      Scanner input = new Scanner(System.in);
      //ask the user to enter the first number
      System.out.println("Type the first number: ");
      // assign the value to a variable
      double first = input.nextDouble();
      // ask the user to enter the second number
      System.out.println("Type the second number: ");
      // assuin the value to a variable
      double second = input.nextDouble();
      // find the smallest betweena those two
      double smallest = Math.min(first,second);
      // calculate the biggest number
      double biggest = Math.max(first,second);
      // print out the smallest of those two
```

```
        System.out.println("The smallest number is: "+smallest);
        // multiply the smallest by 5
        double times5 = smallest * 5;
        // print out the result
        System.out.println(smallest+" times 5 is "+times5);
        // squre the both numbers
        double sqrTimes5 = Math.pow(times5,2);
        double sqrbiggest = Math.pow(biggest,2);
        // print out the new values
        System.out.println("The squre of "+ times5 + " is " + sqrTimes5);
        System.out.println("The squre of "+ biggest + " is " + sqrbiggest);
        // find the new bigger value
        double newBig = Math.max(sqrbiggest,sqrTimes5);
        // find the new smallest value
        double newSmall = Math.min(sqrTimes5,sqrbiggest);
        // print out the result
        System.out.println(newBig+" is larger than "+newSmall);
            }
}
```

Output (2 different outputs/tests):

```
Type the first number:
5
Type the second number:
9
The smallest number is: 5.0
5.0 times 5 is 25.0
The squre of 25.0 is 625.0
The squre of 9.0 is 81.0
625.0 is larger than 81.0

Type the first number:
12
Type the second number:
4
The smallest number is: 4.0
4.0 times 5 is 20.0
The squre of 20.0 is 400.0
The squre of 12.0 is 144.0
400.0 is larger than 144.0
```

Exercise 5. Write a program that uses a Scanner object that asks for your name and your exam, assignment and lab marks. The exam counts for 60%, assignments 30% and labs 10%. The program computes your grade percentage. Test the program with three sets of data and include the results in this report. Do not concern yourself with controlling the display of the decimal point. **[3 marks]**

Sample output:

```
Please enter your name: ..
Please enter your exam mark: ..
Please enter your assignment mark: ..
Please enter your lab mark: ..
Final grade:  ..%
```

Program:

```
/* CSCI 1100-Lab1-Exercise 5
```

```
This program will take the user name and his marks and give back his final mark
 <Mihyar Al-Masalma> <B00759975> <10/4/2016>*/
 import java.util.Scanner; // import Scanner class
 public class Grades {
          public static void main(String[] args) {
                    // create an instance of the scanner class with System.in as argument
       Scanner input = new Scanner(System.in);
       // ask the user to enter his name
       System.out.println("Please enter your name: ");
       // assign the entered value to a variable
       String name = input.nextLine();
       // ask the user to enter his exam mark
       System.out.println("Please enter your exam mark: ");
       // assign the entered value to a variable
       double exam = input.nextDouble();
       // ask the user for the assignment mark
       System.out.println("Please enter your assignment mark: ");
       // assign the entered value to a variable
       double assignment =  input.nextDouble();
       // ask the user to enter his lab mark
       System.out.println("Please enter your lab mark: ");
       // assign the value to a variable
       double lab = input.nextDouble();
       // calculate the marks
       exam = exam * .60;
       assignment = assignment * .30;
       lab = lab * .10;
       double result = exam + assignment + lab;
       // print out the final result
       System.out.println("Final grade:  "+result+"%");
           }
 }
```

Output (2 different outputs/tests):

```
Please enter your name:
Mihyar
Please enter your exam mark:
100
Please enter your assignment mark:
100
Please enter your lab mark:
100
Final grade:  100.0%

Please enter your name:
Ammar
Please enter your exam mark:
50
Please enter your assignment mark:
50
Please enter your lab mark:
50
Final grade:  50.0%
```