[Total 15 marks]

CSCI 1100 – 2016
Laboratory Report 4

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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 explain idea of a random number to the students. Provide some motivation as to why are random numbers important in computing. Show the following short example to the students. This prepares them for example 7.

```
import java.util.Random;
public class Lab4ExRan {
//Create and use a random number generator
  public static void main(String[] args) {
    Random random = new Random();
    int number = random.nextInt(10);
    System.out.println(number);
  }
}
```

Exercise 1. Write a program that asks a user to enter their mark out of 15 for a quiz mark. If the mark is greater than 70% the program writes that you are doing well otherwise it suggests that you visit the Learning Centre. Test the program with two sets of data and include the results in this report that show both outcomes. Do not concern yourself with controlling the display of the decimal point. **[2 marks]**

Sample output.

```
Please type a mark for your quiz: ..
Your score is ...%
Please consider visiting the Learning Centre.
```

Program:

```
/* CSCI 1100-Lab4-Exercise 1
 This program will read the quizz mark of a user and
 evaluate if the user should go to see a learning center or not
 <Mihyar Al-Masalma> <B00759975> <10/11/2016>*/
import java.util.Scanner; // import Scanner class
public class QuizzMark {
	public static void main(String[] args) {
		// create an instance of the scanner class with System.in as argument
		Scanner input = new Scanner(System.in);
		// Asking the user to enter a mark
		System.out.println(" Please type a mark for your quizz: ");
		// Store the value the user entered in a variable
		double mark = input.nextDouble();
		// Calculate the percentage of the mark
		double percentage = (mark*100)/15;
		// Print the percentage to the user
		System.out.println("Your score is "+percentage+" %");
		// Evaluate if the percentage less than 70%
		if (percentage < 70) {
			// if less than, advise the user to visit the learning center
			System.out.println("Please consider visiting the Learning Center.");
		}else{
			// if more than 70% print you are doing well.
			System.out.println("You are doing well.");
		}
	}
}
```

Output (2 different outputs/tests):

```
Please type a mark for your quizz: 14
Your score is 93.33333333333333 %
You are doing well.

Please type a mark for your quizz: 7.5
Your score is 50.0 %
Please consider visiting the Learning Center.
```

Exercise 2. Write a program that asks a user to enter the temperature in Celsius. If the temperature is below 10 degrees, you should tell the user to wear a jacket today – it's going to be cold. Otherwise tell them to wear a sweater. Test the program with two sets of data and include the results in this report that show both outcomes. **[2 marks]**

Sample output

```
Please type the temperature in Celsius: ..
You should wear a jacket – it's cold out!

Please type the temperature in Celsius: ..
You should take a sweater.
```

Program:

```
/* CSCI 1100-Lab4-Exercise 2
 This program will read the temperture entered from a user
 then evaluate it and advise the user what to wear
 <Mihyar Al-Masalma> <B00759975> <10/11/2016>*/
import java.util.Scanner; // import Scanner class
public class Tempreture {
	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 temperture in Celsius
		System.out.print("Please type the temperture in Celsius: ");
		// Store the value the user entered in a variable
		int temp = input.nextInt();
		// Evaluate if the value is less than 10
		if(temp<10){
			// if less than 10 then print this
			System.out.println("You should wear a jacket - it's cold out!");
		}else{
			// if not print this
			System.out.println("You should take a sweater");
		}
	}
}
```

Output (2 different outputs/tests):

```
Please type the temperture in Celsius: 4
You should wear a jacket - it's cold out!

Please type the temperture in Celsius: 15
You should take a sweater
```

Exercise 3. Write a program that can be used by a pizza shop to determine the price of a pizza to calculate the total cost of an order. Write a program that requests the user to enter the number of pizzas that they would like to order. If the number of pizzas are less than 3, then the price for each pizza is 12.99. If the order is 3 or more than 3 pizzas, the price per pizza is 9.99. Calculate the total cost of the order and print the results. Test the program with two sets of data and include the results in this report that show both outcomes. Do not concern yourself with controlling the display of the decimal point. **[2 marks]**

Sample Output

```
Enter the number of pizzas: 2
Your total cost: $ 25.98

Enter the number of pizzas: 5
Your total cost: $ 49.95
```

Program:

```
/* CSCI 1100-Lab4-Exercise 3
 This program will read the number of pizza the user want to order
 then evalute it and give the user back the price
 <Mihyar Al-Masalma> <B00759975> <10/11/2016>*/
import java.util.Scanner; // import Scanner class
public class Pizza {
	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 number of pizzas
		System.out.print("Enter the number of pizzas: ");
		// Store the value the user entered in a variable
		int num = input.nextInt();
		// Evaluate the number if it is less than three
		if (num<3) {
			// if yes then the price for each is 12.99
			double price = num * 12.99;
			// Print out the price
			System.out.println("Your total cost: $ "+price);
		}else {
			// if not then the price for each is 9.99
			double price2 = num * 9.99;
			// print out the price
			System.out.println("Your total cost: $ "+price2);
		}
	}
}
```

Output (2 different outputs/tests):

```
Enter the number of pizzas: 2
Your total cost: $ 25.98

Enter the number of pizzas: 5
Your total cost: $ 49.95
```

Exercise 4. Write a program that asks a user to input a value that represents the income of an employee. The program must compute the income tax payable and the net income of the employee. If the income is less than or equal to $20K (20,000) the overall tax rate is 12%. If the income is greater than $20K (20,000) the tax is 15% on the first $20K and 20% on the amount above $20K. Test the program with two sets of data and include the results in this report that show both outcomes. Do not concern yourself with controlling the display of the decimal point. **[3 marks]**

Sample output

```
Please enter the salary: $10000
Tax payable: $1200
Net income: $8800

Please enter the salary: 25000
The tax payable is $4000
The net income is $19000
```

Program:

```
/* CSCI 1100-Lab4-Exercise 4
 This program will read the salary the user enter then evaluate it
 and calculate the taxes and the net salary and give it back to the
 user
 <Mihyar Al-Masalma> <B00759975> <10/11/2016>*/
import java.util.Scanner; // import Scanner class
public class Taxes {
	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 salary
		System.out.print("Please enter the salary: ");
		// Store the salary in a variable
		int salary = input.nextInt();
		// Evaluate if the salary is less than 2000
		if (salary < 20000) {
			// if yes then calculate the tax
			double tax = salary * 0.12;
			// calculate the net salary
			double net = salary - tax;
			// print out the tax
			System.out.println("Tax payable: $"+tax);
			// print out the net income
			System.out.println("Net income: "+net);
		}else{
			// if not then calculate the tax for the first 20K
			double tax1 = 20000 * 0.15;
			// calculate the tax for the rest of the salary
			double tax2 = (salary - 20000) * 0.2;
			// add both taxes and store it in a variable
			double totalTax = tax1 + tax2;
			// calculate the net income
			double netSalary = salary - totalTax;
			// print out the total tax
			System.out.println("The tax payable is $"+ totalTax);
			// print out the net income
			System.out.println("The net income is $"+ netSalary);
		}
	}
}
```

Output (2 different outputs/tests):

```
Please enter the salary: 10000
Tax payable: $1200.0
Net income: 8800.0

Please enter the salary: 25000
The tax payable is $4000.0
The net income is $21000.0
```

Exercise 5. Write a program that asks you to guess a random integer number between 1 and 15. If you get it right it says "Good guess" otherwise it says "Wrong - Better luck next time". Use the Random Class to generate a number. Test the program with two sets of data and include the results in this report that show both outcomes. Do not concern yourself with controlling the display of the decimal point. **[4 marks]**

Sample output:

```
I have a number between 1 and 15. Please enter your guess: ..
Wrong – better luck next time.
.
I have a number between 1 and 15. Please enter your guess: ..
Good guess.
```

Program:

```
/* CSCI 1100-Lab4-Exercise 5
 This program will generate random number between 1 and 15
 and will ask the user to guess it
 <Mihyar Al-Masalma> <B00759975> <10/11/2016>*/
import java.util.Scanner; // import Scanner class
import java.util.Random; // import random class
public class Guess {
	public static void main(String[] args) {
		// Create an instance of the Random class
		Random random = new Random();
		// generate a random number from this range and assign it to a variable
		int rand = random.nextInt(15)+1;
		// Create an instance of the Scanner class
		Scanner input = new Scanner(System.in);
		// Ask the user to try and guess the number
		System.out.print("I have a number between 1 and 15. Please enter your guess: ");
		// Store the value the user entered
		int guess = input.nextInt();
		// Evaluate the value the user entered
		if (guess != rand) {
			// if the guess doesn't equal the randome number print this
			System.out.println("Wrong - better luck next time");
		}else{
			// else print good guess
			System.out.println("Good guess.");
		}
	}
}
```

Output (2 different outputs/tests):

```
I have a number between 1 and 15. Please enter your guess: 2
Wrong - better luck next time

I have a number between 1 and 15. Please enter your guess: 2
Good guess.
```