TP/TD 02 Introduction to Java programming language - Solution

Part One (control flow and loops): ★★☆☆☆

1. Write a JAVA program that:
   a. Ask a user to enter his exam score using **args** input.
   b. Display a "text mark" according to the entered score, and following this table:

Note Range	17-20	15-17	13-15	10-13	8-10	5-8	0-5
Signification	Excellent	Très bien	Bien	Satisfaisant	Suffisant	Médiocre	Insuffisant

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

        int mark = Integer.parseInt(args[0]);
        if(17<mark && mark<=20) {
            System.out.println("Excellent");
        }else if (15<mark && mark<=17){
            System.out.println("Très bien");
        }else if (13<mark && mark<=15){
            System.out.println("Bien");
        }else if (10<mark && mark<=13){
            System.out.println("Satisfaisant");
        }else if (8<mark && mark<=10){
            System.out.println("Suffisant");
        }else if (5<mark && mark<=8){
            System.out.println("Médiocre");
        }else{
            System.out.println("Insuffisant");
        }
    }
}
```

2. Given the following two java programs:
   a. Show the exact output produced by each program
   b. Write each one of them and execute to confirm.

```java
public static void main(String[] args) {
    int N;
    N = 1;
    while (N <= 32) {
       N = 2 * N;
       System.out.println(N);
       }
}
```

```
2
4
8
16
32
64
```

```java
public static void main(String[] args) {
    int x,y;
    x = 5;
    y = 1;
    while (x > 0) {
       x = x - 1;
       y = y * x;
       System.out.println(y);
    }
}
```

```
4
12
24
24
0
```

3. We are interested in computing the sum of the following series: **Sum = 1 + 1/2 + 1/3 + 1/4 +……1/n**

a. Write a java program that computes this series in which n is input by a user.

```java
import java.util.Scanner;

public class SumOfSeries {
    public static void main(String[] args) {
        Scanner console = new Scanner(System.in);
        int number;
        double sum = 0;
        System.out.print("Enter number of terms of series : ");
        number = console.nextInt();
        for(int i = 1; i <= number; i++){
                sum += 1.0/i;
                    }
        System.out.println("sum: " + sum);
    }
}
```

4. Write a program that:

a. Asks the user to guess the number.

b. Then our program should generate a random number.

- ✓ if the user's guess is higher than the random number, the program should display "Too high."
- ✓ If the user's guess is lower than the random number, the program should display "Too low."
- ✓ if a user choice is correct, the program should display "Great job!."

```java
import java.util.Scanner;

public class GuessNumber {
    public static void main(String[] args){
        Scanner console = new Scanner(System.in);
        int number, guess, tries = 0;
        number = (int) (Math.random() * 100) + 1;
        System.out.println("Guess My Number Game");
        System.out.println();

        System.out.print("Enter a guess between 1 and 100 : ");
        guess = console.nextInt();
        tries++;
        if (guess > number) {
             System.out.println("Too high! Try Again");
        } else if (guess < number) {
            System.out.println("Too low! Try Again");
        } else {
            System.out.println("Correct! You got it in " + tries + " guesses!");
        }
    }
}
```

5. Edit the past program to use a loop that repeats until the user correctly guesses the random number then it exits the program.

```java
import java.util.Scanner;

public class GuessNumber {
    public static void main(String[] args){
        Scanner console = new Scanner(System.in);
        int number, guess, tries = 0;
        number = (int) (Math.random() * 100) + 1;
        System.out.println("Guess My Number Game");
        System.out.println();
        do {
            System.out.print("Enter a guess between 1 and 100 : ");
            guess = console.nextInt();
            tries++;
            if (guess > number) {
                System.out.println("Too high! Try Again");
            } else if (guess < number) {
                System.out.println("Too low! Try Again");
            } else {
            System.out.println("Correct! You got it in " + tries + " guesses!");
            }
        }while (guess != number);
    }
}
```

6. Write a program a JAVA program asks a user for his (Username and password). After 3 wrong inputs, the user will be rejected. Note: Username and password Both must be strings. credentials

```java
import java.util.Scanner;

public class Credentials {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        String username,pass;
        int attempts = 0;

        do {
            System.out.print("Enter a username: ");
            username = scanner.next();

            System.out.print("Enter a password: ");
            pass = scanner.next();

            attempts++;
        } while (!username.equals("user") && !pass.equals("password") && attempts != 3);

        if (attempts==5){
            System.out.println("Login incorrect.");
        }else{
        System.out.println("Login correct."); }
        scanner.close();
    }
}
```

Part Two (Java Scanner):

1. Write a small calculator!
    a) Ask the user for 2 numbers
    b) Ask the user for an operation. (Similar to Exercise 3: 1 -> +, 2 -> -, 3 -> *, 4 -> /)
    c) Execute the operation with the two numbers and print the result to the screen

Dr. Oussama SERHANE (o.serhane@esi-sba.dz)

```java
import java.util.Scanner;

public class SimpleCalculator {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);
        System.out.println("First number:");
        double number1 = scanner.nextDouble();
        System.out.println("Second number:");
        double number2 = scanner.nextDouble();
        System.out.println("Please specify an operation:");
        System.out.println("1 -> +");
        System.out.println("2 -> -");
        System.out.println("3 -> *");
        System.out.println("4 -> /");
        int operation = scanner.nextInt();

        if(operation == 1) {
          double result = number1 + number2;
          System.out.println("Result of " + number1 + " + " + number2 + " is " + result);
        } else if(operation == 2) {
          double result = number1 - number2;
          System.out.println("Result of " + number1 + " - " + number2 + " is " + result);
        } else if(operation == 3) {
          double result = number1 * number2;
          System.out.println("Result of " + number1 + " * " + number2 + " is " + result);
        } else if(operation == 4) {
          double result = number1 / number2;
          System.out.println("Result of " + number1 + " / " + number2 + " is " + result);
        } else {
          System.out.println("Invalid operation");
        }
    }
}
```

2. **Objective:** We are interested in designing a distribution machine for **Flexy** services. **Description:** In Algerian mobile operators, a client could choose an internet/credit offer by typing an (Unstructured Supplementary Service Data) ussd code, for instance, for Djezzy Operator, a user will type *444#. Then the client selects a number of one of the listed options (as shown in the **Fig 1**). In this example we are interested to clone the similar process, using java. The information printed by the menu are as the following:

Bienvenue a IMTIYAZ
4: 190DA= 1000DA Tous + 3Go / 24
44: 1500Da=Ilimite Djezzy+3000DA+40Go/30jrs
45:1200Da=Ilimite Djezzy+2500DA+30jrs
46:1000Da=ilimite Djezzy+3000DA+20Go/30jrs
41:Parametres
0:retour

```
Bienvenue a IMTIYAZ
Entrer votre Credit!
1500
Choisissez l'offre qui vous convient
4: 190DA= 1000DA Tous + 3Go / 24
44: 1500Da=Ilimite Djezzy+3000DA+40Go/30jrs
45:1200Da=Ilimite Djezzy+2500DA+30jrs
46:1000Da=ilimite Djezzy+3000DA+20Go/30jrs
41:Parametres
0:retour
44
Vous avez recue 1500Da=Ilimite Djezzy+3000DA+40Go/30jrs
restante: 0.0
```

Our program should:

- ✓ show the above menu description.
- ✓ ask a user for his credit (enter the coins).
- ✓ makes a user select one of the options and shows him a success of the operation

Improvement:

- ✓ Add a code to check if the user could benefit from this service
- ✓ Our machine should return the remaining money

```
import java.util.Scanner;
public class Operateur {
    public static void main(String args[])  {
        double remainning = 0.0;
        Scanner scanner = new Scanner(System.in);

        System.out.println("Bienvenue a IMTIYAZ");
        System.out.println("Entrer votre Credit!");
        double credit = scanner.nextDouble();
        System.out.println("Choisissez l'offre qui vous convient");
        System.out.println("4: 190DA= 1000DA Tous + 3Go / 24");
        System.out.println("44: 1500Da=Ilimite Djezzy+3000DA+40Go/30jrs");
        System.out.println("45:1200Da=Ilimite Djezzy+2500DA+30jrs");
        System.out.println("46:1000Da=ilimite Djezzy+3000DA+20Go/30jrs");
        System.out.println("41:Parametres");
        System.out.println("0:retour");

        String userChoice = scanner.next();

        switch(userChoice) {
            case "4":
                if(credit >= 190){
                    System.out.println("Vous avez recue 190DA= 1000DA Tous + 3Go / 24");
                    remainning = credit - 190;
                }else{
                    System.out.println("Votre credit est insuffisant !"); } break;
            case "44":
                if(credit >= 1500){
                    System.out.println("Vous avez recue 1500Da=Ilimite Djezzy+3000DA+40Go/30jrs");
                    remainning = credit - 1500;
                }else{
                    System.out.println("Votre credit est insuffisant !"); } break;
            case "45":
                if(credit >= 1200){
                    System.out.println("Vous avez recue 1200Da=Ilimite Djezzy+2500DA+30jrs");
                    remainning = credit - 1200;
                }else{
                    System.out.println("Votre credit est insuffisant !"); } break;
            case "46":
                if(credit >= 1000){
                    System.out.println("Vous avez recue 1000Da=ilimite Djezzy+3000DA+20Go/30jrs");
                    remainning = credit - 1000;
                }else{
                    System.out.println("Votre credit est insuffisant !"); } break;
            case "41":
                    System.out.println("Parametres"); break;
            case "0":
                System.out.println("Merci !"); break;
              default:
                System.out.println("Entrée invalide !"); }
            System.out.println("restante: " + remainning);
    }
}
```