GLA University, 2019

BCSC0002: Object-Oriented Programming

Lab 03

Programming Exercises

Please complete the following programs in **`Java`** and confirm it with your respective faculty. You are free to use any IDE of your choice, writing the program's source code in a plain notepad program in also acceptable.

1. Program 1

   Write a program in `Java`, to determine the sum of the following harmonic series for a given value of `n`;

   $$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + ... + \frac{1}{n}$$

   The value of `n` should be given interactively through the keyboard.

   Hint: Use the `Scanner` class from the package `java.util.Scanner`.

   Note: In `Java` programming language, we assume the whole numbers as the type `int` by default and the rational numbers as the type `double` by default.

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2. Program 2

   Write a program in `Java`, to read the price of an item in decimal form (like ₹45.95) and print the output in Rupees and Paise.

   Sample Input

   ```
   45.95
   ```

   Sample Output

   ```
   45 Rupees and 95 Paise
   ```

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3. Program 3

   Write a program in `Java`, to covert the given temperature in `Fahrenheit` to `Celsius` using the following conversion formula:

   $$C = \frac{F - 32}{1.8}$$

   and output the resulting value to the user.

Sample Input

```
97.4
```

Sample Output

```
36.333333
```

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4. Program 4

   Write a program in `Java`, to display the following to the console output window.

```
1
2   2
3   3   3
4   4   4   4
5   5   5   5   5
6   6   6   6   6   6
7   7   7   7   7   7   7
8   8   8   8   8   8   8   8
9   9   9   9   9   9   9   9   9
```

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5. Program 5

   Write a program in `Java`, to display the day of the a date input by the user.

   Hint: You can study a sample formula for the given program here.

   Sample Input

```
date: 15
month: 8
year: 2019
```

   Sample Output

```
15th August 2019 was a Thursday!
```

Debugging Exercises

The following programs have some form of `compile-time errors`. Identify and remove the errors, so that the program runs successfully.

1. Program 1

```
public static void display() {
    int x = 123456;
    float f = 100.12;
    System.out.println("The float value = " + f);
}
```

2. Program 2

```
public static void display() {
    int y;
    if (x > 10) {
        y = x;
    }
    System.out.println("The value of Y = " + y);
}
```

3. Program 3

   Modify the code in such a way, that the value of the variable `pi` is not modifiable (i.e it becomes a constant).

```
public static void calculate() {
    float pi = 3.14f;
    System.out.println("The value of Pi = " + pi);
}
```

4. Program 4

```
public static void convert() {
    int i = 1245;
    byte b = i;
    System.out.println("The value of the Byte variable b = " + b);
}
```

5. Program 5

```
class ScopeDemo {
    public static void main(String[] args) {
        int m = 10;
        {
            int m = 20;
        }
    }
}
```