CEGEP VANIER COLLEGE
Department of Computer Science

420-101-VA PROGRAMMING 1 sections 1 &2

Assignment_01: Due September 15th, 2023, at 11:59pm — Prof. Nagat Drawel

Overview:

The purpose of this assignment is to learn:

1. How to input through the Java console
2. How to output through the Java console, you should be able to know the difference between `print()`, `println()`, and how to efficiently use `printf()`.
3. How to use escape sequence to add a line breaker, a percentage symbol "%" in `printf()`.
4. How to use the methods in the `Math` class.
5. How to use mathematics knowledge to solve real-world calculation problems.

Notes:

1. Please make sure to follow the programming standards (e.g., naming conventions, comments, @author); **Keep your code clean** (Indentation, Spaces, etc.,) not doing so will result in loss of marks.
2. Please demonstrate your working programs to your teacher.
3. Your assignment code must be handed in electronically via Lea.
4. **Please submit one .java file for each task (4 .java files in total, Omnivox accepts multi-submission)**. **DO NOT ZIP YOUR FILES**.
5. Assignment sent by MIO will not be accepted.

Task 01

Write a java program that reads a single value representing an amount in Canadian dollars and prints out its equivalent amount in four other currencies of your choice. To get the required exchange rates go to http://xe.comyour/. Format your output so all results must contain only two decimal digits.

Task 02

Suppose that you are in charge of organizing a social event in your company and you want to print name tags for all attendees. Write a java program that will ask each one that shows up to enter their name (First and then Last) and their job title. The program will then print a name tag for the person. For the purposes of this assignment, the program must print only one name tag per execution. You can format the name tag any way you want. The only requirement is that

the name is printed in the following format (LASTNAME, FIRSTNAME) and the job title is printed below the name. Use printf() to align your output, you cannot use hard-coded space to tune the width.

Sample output:

```
-----------------------------------
|                                 |
|          Nagat, Drawel          |
|  Job: Computer Science Teacher  |
|                                 |
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```

Task 03

Write a Java program that calculates the monthly payments for a mortgage loan. The program must perform the following steps:
1) read the loan amount, the number of years, and the annual interest rate from the keyboard;
2) calculate the monthly interest rate from the annual interest rate (divide by twelve);
3) compute and print the monthly payment using the formula given below;
4) compute and print the total payment, which is equal to the monthly payment times 12 times the number of years.

$$\frac{\text{loanAmount} \times \text{monthlyInterestRate}}{1 - \frac{1}{(1 + \text{monthlyInterestRate})^{numberOfYears \times 12}}}$$

Sample output

```
 == LOAN CALCULATOR PROGRAM ==
Please enter loan amount: 25000
Please enter number of years: 15
Please enter APR: 0.07

The monthly payment is: 139.623
The total   payment is: 25132.209
```

Task 04:

Write a program that will compute the gas cost for an automobile. The program should ask the user to input a distance in **km** (1 mile = 1.60934 km). A car needs **1 gallon of gas for 11 miles**. The price for each liter of gas is $1.33. (1 gallon = 3.78541 liters). The government will cover 5% of the gas cost, while the driver will pay for the rest.

Create a program that calculates the gas cost for a car journey. The program will request the user to provide the distance in kilometers (where 1 mile equals 1.60934 kilometers). It is known that a car consumes 1 gallon of gas for every 11 miles traveled, and the price for each liter of gas is $1.33 (where 1 gallon equals 3.78541 liters). Additionally, the government will subsidize 5% of the gas cost, while the driver will be responsible for covering the remaining expenses.

Please declare the two conversion ratios (1 mile = 1.60934 km and 1 gallon = 3.78541 liters) as constant variables. Use `printf()` to align the heading part

```
How many kms will you drive?: 200

Distance (km)   : 200.00
Distance (mile): 124.27
-----------------------------
Gas (gallon)    : 11.30
Gas (liter)     : 42.77
-----------------------------
Total Price     : 56.88
Goverment Cover: 2.84
Driver Cover    : 54.04
```