MIS 768: Java Programming
Spring 2019

Individual Assignment 1

Due Date: **5:29 PM, February 7, 2019** (Submit via WebCampus).
Weights: 5% of total grades.

Purpose

- Declare variables and constants and use them in a program.
- Design a decision structure to evaluate different conditions and execute different instructions accordingly.
- Design a loop structure to repeat a set of statements under a certain condition.
- Handle user input and show output/results properly.

Note

1. Please zip the **.java** files and upload the zip file to WebCampus for submission.
2. Please provide proper comments to document your code, including the following:
   a. Author's name;
   b. Purpose of the program;
   c. In-line comments for the statements, including the variable/constant declaration and initialization.

Questions

1. (20 points) Write a Java program that computes the tax and tip on a restaurant bill. When the user enters the charge for the meal, the program should calculate the tax amount, the tip amount, and the total.
   The tax should be 8.1 percent of the meal charge. The tip should be 18 percent of the total after adding the tax.
   Display the meal charge, tax amount, tip amount and total bill on the screen.

   Grading criteria:

   (1) Correctness
      (a) The code can be compiled without any syntax error.
      (b) The code can generate the requested results. Please make up some numbers to test the program and validate the results.
      (c) The program is documented using comments.
   (2) Technique used
      (a) Variable and constant declaration and initialization is done following the naming convention of Java programs. (Note: Constant must be used in this program).
      (b) Getting user input is properly implemented. (You can use the text at the console or the dialog boxes)
      (c) Arithmetic operators are used.
      (d) Results are displayed and formatted properly. (You can use the text at the console or the dialog boxes)

2. (30 points) Write a program that computes the income tax for an individual. The program should ask the user to enter the total taxable income of the year. The program then uses the tax bracket (as shown below) to calculate the tax amount:

    10% on taxable income from $0 to $9,325, plus
    15% on taxable income over $9,325 to $37,950, plus
    25% on taxable income over $37,950 to $91,900, plus
    28% on taxable income over $91,900 to $191,650, plus
    33% on taxable income over $191,650 to $416,700, plus
    35% on taxable income over $416,700 to $418,400, plus
    39.60% on taxable income over $418,400

    The program should display the total tax due to the user.
    The program should show an error message if the user enters a negative number.

    Grading criteria:

    (1) Correctness
        (a) The code can be compiled without any syntax error.
        (b) The code can generate the requested results. Please make up some numbers to test the program and validate the results.
        (c) The program is documented using comments.
    (2) Technique used
        (a) Variable and constant declaration and initialization is done following the naming convention of Java programs. (Note: Constant must be used in this program).
        (b) Getting user input is properly implemented. (You can use the text at the console or the dialog boxes)
        (c) Arithmetic operators are used.
        (d) Results are displayed and formatted properly. (You can use the text at the console or the dialog boxes)
        (e) **if-else** or **switch** statements should be used to complete the program.

3. (50 points) A hotel's occupancy rate is calculated as follows:
    occupancy rate = number of rooms occupied ÷ total number of rooms.

    Write a program that calculates the occupancy rate for a hotel. The program should start by asking for the number of floor in the hotel. A loop should then iterate once for each floor. For each iteration, the program should ask the user for the number of rooms on the floor and the number of them being occupied. After all the iterations, the program should display the number of rooms the hotel has, the number of them being occupied, the number that are vacant, and the occupancy rate for the hotel.

    Input validation:
    Do not accept a value less than 1 for the number of floors.
    Do not accept a number less than 10 for the number of rooms on a floor.
    Do not accept a number less than 0 for the number of them being occupied on a floor.
    The number of occupied room should be less than or equals to the number of rooms on a floor.

```
How many floors does the hotel have? 0
Invalid. Enter 1 or more: 2
How many rooms does floor 1 have? 8
Invalid. Enter 10 or more: 30
How many occupied rooms does floor 1 have? 10
How many rooms does floor 2 have? 50
How many occupied rooms does floor 2 have? 23
Number of rooms: 80.0
Occupied rooms: 33.0
Vacant rooms: 47.0
Occupancy rate: 41%
```

Grading criteria:

(1) Correctness
  (a) The code can be compiled without any syntax error.
  (b) The code can generate the requested results. Please make up some numbers to test the program and validate the results.
  (c) The program is documented using comments.

(2) Technique used
  (a) Variable declaration and initialization is done following the naming convention of Java programs..
  (b) Getting user input is done, including proper input validation
  (c) Arithmetic operators are used, including proper formatting.
  (d) Loop statements (**for** or **while**) should be used to complete the program.