Object Oriented Programming

COP2513

Spring 2021

Assignment 1

Classes and Objects

Total: 100 points

Due Date: 2-8-2021 by 8am

The assignment is organized according to the following sections: (A) Objective, (B) Description, (C) Evaluation, and (D) Submission.

A. Objective

The assignment goal is to develop a program in Java that computes your most regular monthly expenses.

B. Description

The program should include 2 classes, Expense.java and MyExpenses.java, inside a package called expenses.

B.1 Expense Class

Implement Expense class inside a package called expenses that contains:
- A private String data field serviceType, e.g. "Electricity", "Gas", etc.
- A private String data field billDate, e.g. "Jan 4 2021".
- A private double (or Double) data field billAmount, e.g. 25.00.
- A private String data field dueDate, e.g. "Jan 30 2021".
- A private String data field paymentDate ,e.g. "Jan 20 2021".
- A private String data field paymentForm, e.g. "Credit Card", "Check", etc.
- A private String data field paymentRefNumber, e.g. "123456", etc. (Do not use your real reference information. The number may be composed of year, month, day, and any additional number, e.g. "20210101-9")
- A private double (or Double) data field named paymentAmount, e.g. 10.00.
- A private double (or Double) data field named balanceAmount, computing the difference between the billAmount and the paymentAmount for the expense.
- Methods that set and return the values for each variable. Note that for balanceAmount there should only be a "get" method, and not a "set" method.
- A constructor method receiving all the arguments required to create each expense.
- A print method printing the values of all variables in the class.

B.2 MyExpenses Class

Implement MyExpenses class inside a package called expenses that contains:
- An array called myExpenses where all expense objects are stored.
- An "init" method where all expense objects are created. Each expense object needs to be stored in myExpenses array. All expense values need to be passed as

arguments when constructing each expense object. You need to include at least 5 different expense objects.
- A "print" method printing all the attributes for each expense object, the total amount of expenses and the total balance.
- The "main" method that calls the <u>init</u> and <u>print</u> methods.

B.3 Program Output

The program output format should be as follows:

```
Expenses for Joe Doe

ServiceType: Electricity
BillDate: Dec 10 2020
BillAmount: 126.5
DueDate: Jan 5 2021
PaymentDate: Jan 1 2021
PaymentForm: Credit Card
PaymentRefNumber: 123456
PaymentAmount: 126.5
BalanceAmount: 0.0

ServiceType: Gas
BillDate: Dec 5 2020
BillAmount: 26.0
DueDate: Jan 1 2021
PaymentDate: Dec 30 2020
PaymentForm: Credit Card
PaymentRefNumber: 8765
PaymentAmount: 10.0
BalanceAmount: 16.0

ServiceType: Water
BillDate: Dec 30 2020
BillAmount: 98.77
DueDate: Jan 30 2021
PaymentDate: Jan 25 2021
PaymentForm: Credit Card
PaymentRefNumber: AE657
PaymentAmount: 10.0
BalanceAmount: 88.77

ServiceType: Internet
BillDate: Dec 14 2020
BillAmount: 47.55
DueDate: Jan 2 2021
PaymentDate: Jan 1 2021
PaymentForm: Credit Card
PaymentRefNumber: 3879
PaymentAmount: 10.0
BalanceAmount: 37.55

Total Expenses: 298.82
Total Balance: 142.32
```

C. Evaluation

Evaluation is based on the submitted Java software and report.

C.1 Software (90 points)

If the program does not compile or shows runtime errors, your grade will be reduced:
- Compilation errors penalty: 60 points
- Runtime errors penalty: 30 points

C.2 Report (10 points)

Report should include the following information:
- Your name and student ID.
- IDE you use.
- UML class diagram. (3 points)
- The source code of your "java" files (you can do "copy" and "paste" from the original source code). (2 points)
- A copy of your program output directly copied from your IDE output. (3 points).
- A conclusions section that describes how you structured your code and any issues you encountered, if any. (2 points)

D. Submission

Submission should be uploaded to Canvas as follows:
1. The submission should be a single "zip" file named "Assignment1" followed by your full name and student ID, e.g. "Assignment1_JoeDoe_U12345678".
2. The "zip" file should contain:
   - A folder with the same name as your "zip" file, e.g. "Assignment1_JoeDoe_U12345678", containing the "src" folder with all your java files.
   - Report in PDF format. This file should be outside the "src" folder.