CSE 2102: Introduction to Software Engineering

Inheritance & Polymorphism

Assigned: October 19, 2022, Due: October 26, 2022

Problem A

Extending the inheritance hierarchy covered in the lab, define a class `Employee`, derived from the class `Person`. An employee record inherits an employee name from the class `Person`. In addition, an employee record contains an annual salary represented as a single value of type `double`, a hire date that gives the year hired as a single value of type `int`, and an identification number that is of type `String`. For the `Employee` class, implement:

- A constructor that creates an instance of an Employee by accepting inputs for all the instance variables: -- Name, ID, Salary, Year of Hire.
- Accessor and mutator methods for all the instance variables. Bear in mind that some instance variables and methods could be inherited from the class Person.
- `writeOutput()` method that prints the values of all the instance variables for a given employee.
- Compares whether two employees are the same. Two employees are the same if all the instance variables are identical, that is, they have the same name and identification number, earn the same salary, and were hired in the same year.

Write a test client `TestEmployee.java` that tests the implementation of the Employee class according to the following steps:

1. Prompt the user to input the values of the instance variables for Employee #1.
2. Creates an object to represent Employee #1 using the values collected from the user in Step #1.
3. Prints the output of all the instance variables for Employee #1 created in Step 2.
4. Resets the name and salary of Employee #1 object created in Step 2.
5. Prompt the user to input the values of the instance variables for Employee #2.
6. Create an instance of Employee #2 using these values collected from the user.
7. Compare whether employees #1 and #2 are the same.

The following represents a sample interaction with the user:

```
Employee 1
Enter employee name: John Smith
Enter employee id:  ABC123
Enter employee salary: 120000
Enter date (year) of hire: 2002

Name: John Smith
Employee ID: ABC123
Salary:  120000.0
Year of Hire: 2002

Enter new name for employee #1: John Doe
Enter new salary for employee #1: 130000

Name: John Doe
Employee ID: ABC123
Salary:  130000.0
Year of Hire: 2002

Employee 2
Enter employee name: Jane Doe
Enter employee id:  ABC123
Enter employee salary: 130000
Enter date (year) of hire: 2002
Name: Jane Doe
Employee ID: ABC123
Salary:  130000.0
Year of Hire: 2002
Name: John Doe
Employee ID: ABC123
Salary:  130000.0
Year of Hire: 2002

They are not the same employees
```

Submission

The following deliverables must be submitted on HuskyCT by midnight on October 26, 2022.

a) Well-documented code.

b) At least 2 use cases that you used to test the code. Each use case should represent a complex interaction as outlined in the test client script. The two use cases must be submitted in a separate Word document, in the form of an interaction shown in the example above.

c) Please make sure that your code compiles, we will test your code offline with specific test cases (common to all).

d) Late submissions (without any legitimate excuse) will incur a penalty of 10% per day.