

Lab Exercise 6 (Inheritance)

Instruction:

This is an individual assessment.

You'll have to submit both softcopy and hardcopy of the program.

Discussion is allowed BUT do it on your own. Copy and paste work will cause you a penalty.

“It is not only for what we do that we are held responsible,
but also for what we do not do”

Task:

A company pays its employees on a monthly basis. There are three types of employees: Salaried employees are paid a fixed monthly salary regardless of the number of hours worked whereas commission employees are paid a percentage of their sales. In addition, salaried-commission employees receive a base salary plus a percentage of their sales. For the current pay period, the company has decided to reward salaried-commission employees by adding 10% to their base salaries. The company wants to implement a Java application that performs its payroll calculations.

Based on the problem statement above, you need to construct a program using the following classes:

Class **PayrollSystem**

- This is the main class, in which three objects are created accordingly to represent the different types of employees in here.
- Use array list to implement the polymorphism if the objects being manipulated.
- Perform special processing on `BasePlusCommissionEmployee` objects in which the base salary of the employees increases by 10% using the formula shown in Figure 1. The sample output of the program is shown in Figure 2.

Class **Employee**

- Has data members, constructor and set/get methods.
- Has a method to return the complete information of the members in a string type.
- Has an abstract method to return the earnings from the subclass.

Class **SalariedEmployee**

- Has data member, constructor, and set/get methods.
- Has a method to return the earnings of salaried employees which overrides the abstract method earnings in the `Employee` class.
- Has a method to return the complete information of this class in a string type which overrides the same method in the `Employee` class.

Class `CommissionEmployee`

- Has data member, constructor, and set/get methods.
- Has a method to return the earnings of this commissioned employees which overrides the abstract method `earnings` in the `Employee` class and is calculated using the formula shown in Figure 3.
- Has a method to return the complete information of this class in a string type which overrides the same method in the `Employee` class.

Class `BasePlusCommissionEmployee`

- Has data member, constructor, and set/get methods.
- Has a method to return the total earnings of this base plus commissioned employees which calls the superclass `CommissionEmployee` earnings and adds with the base salary to get the total earnings.
- Has a method to return the complete information of this class in a string type which reuse the superclass method and overrides the same method in the `Employee` class.

$$\text{Base Salary} = 1.10 * \text{Old Base Salary}$$

Figure 1: Formula to calculate the new base salary with the increment of 10%

```
Salaried Employee: Mohd Akmal
MyKad : 801123-10-5749
Monthly Salary : RM2,400.00
Earned RM2,400

Commission Employee : Sanjay Menon
MyKad : 870314-08-5517
Gross Sales: RM10,000; Commission rate: 0.06
Earned RM600.00

Base-salaried Commission Employee: Siti Elizad
MyKad : 900721-02-5166
Gross Sale : RM5,000.00; Commission rate: 0.04;
Base salary: RM1,200.00
New Base salary with 10% increase is : RM1,320.00
Earned RM1,520.00
```

Figure 2: Sample output of the Payroll System application

$$\text{Earnings} = \text{Commission Rate} * \text{Gross Sale}$$

Figure 3: Formula to calculate the earnings of the commissioned employee