# Norima Java 102 Part 1

## Assignment 1: Inheritance and Polymorphism

**Weight:** 30 marks

**Type:** Individual

**Purpose:**

To build your understanding of Inheritance and Polymorphism through hands on practice.

**Questions**

**1. Payroll – 30 marks**

Write an employee payroll program that uses polymorphism to calculate and print the weekly payroll for your company. There are three types of employees — hourly, salaried, and salaried plus commission. Each type of employee gets paid using a different formula. But for all employee types, if the calculated paycheck exceeds $1000, the actual paycheck must be decreased to $1000.

`Employee` class:

Instance variables:
- name
- social security number
- birthday month
- birthday week.

`load` method :

Prompts the user for instance-variable values and loads the entries.

`toString` method:

Returns a string that shows the employee's name, social security number, and paycheck.. Use the `String.format` method (See Java API documentation to help you format the string as shown in the sample session's paycheck report.) Here's an example from the sample session:

```
employee: Biff Sanchez
social security number: 111-11-1111
paycheck: $800.00
```

`getBonus` method:

Generates a $100 employee birthday bonus. Compare the employee's birthday with the current date found on your computer system. Use the `Calendar` class to generate the current date. (See the Java API documentation.) If the employee's birthday month and birthday week match your computer system's current month and current week, then increment the employee's paycheck by $100. The `birthdayMonth` holds the month (1–12) in which the employee was born. The `birthdayWeek` holds the week (1–4) that the employee chooses to get paid his/her bonus.

`Hourly` class:

Instance variables:
hourly pay
hours worked during the past week

`load` method:
Prompts the user for instance-variable values and loads the entries.

Include a `getEarnings` method that calculates earnings for an hourly employee. Hourly employees are paid by the hour. If they work more than 40 hours in a week, then they receive overtime pay for their overtime work. Overtime pay equals one and a half times their normal hourly pay.

`Salaried` class:

Instance variables:
weekly salary

`load` method:
Prompts the user for instance-variable values and loads the entries.

Include a `getEarnings` method that calculates earnings for a salaried employee. Salaried employees are paid their fixed weekly salary regardless of the number of hours they work.

`SalariedPlusCommission` class:

Instance variables:
sales during the past week
commission rate

`load` method:

Prompts the user for instance-variable values and loads the entries.

Include a `getEarnings` method that calculates earnings for a `SalariedPlusCommission` employee. `SalariedPlusCommission` employees are paid a base salary plus a percentage of their sales. "Percentage of their sales" equates to the product of their sales times their commission rate.

Use initially declared named constants instead of hardcoded "magic numbers" embedded in the program. In the `Employee` class, include a `getEarnings` method that is `abstract`.

Use the `public` access modifier for the `toString` method in the `Employee` class and the `load` method in the `Employee`, `Hourly`, `Salaried`, and `SalariedPlusCommission` classes.

Provide a driver that generates the following queries and outputs.

Sample session (assuming current month = 10 and current week = 2):

```
Number of employees: 3

PROFILE FOR EMPLOYEE #1:
type Hourly(1), Salaried(2), Salaried plus Commission(3)
Enter 1, 2, or 3 ==> 1
Name ==> Biff Sanchez
Social security number ==> 111-11-1111
Birthday month (1-12) ==> 2
Birthday bonus week (1-4) ==> 3
Hourly pay ==> 20
Hours worked this past week ==> 30

PROFILE FOR EMPLOYEE #2:
type Hourly(1), Salaried(2), Salaried plus Commission(3)
Enter 1, 2, or 3 ==> 2
Name ==> Dirk Jones
Social security number ==> 222-22-2222
Birthday month (1-12) ==> 10
Birthday bonus week (1-4) ==> 2
Salary ==> 700

PROFILE FOR EMPLOYEE #3:
type Hourly(1), Salaried(2), Salaried plus Commission(3)
```

```
Enter 1, 2, or 3 ==> 3
Name ==> Suzie Que
Social security number ==> 333-33-3333
Birthday month (1-12) ==> 7
Birthday bonus week (1-4) ==> 3
Salary ==> 400
Sales for this past week ==> 2000
Sales commission rate (fraction paid to employee) ==> .25
employee: Biff Sanchez
social security number: 111-11-1111
paycheck: $600.00

employee: Dirk Jones
social security number: 222-22-2222
paycheck: $800.00

employee: Suzie Que
social security number: 333-33-3333
```