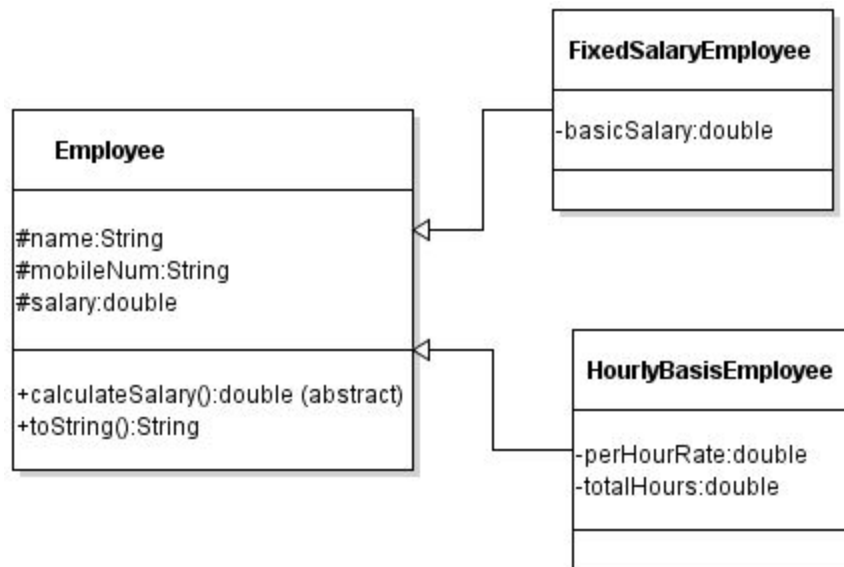


North South University
Department of Electrical and Computer Engineering
Final Assignment – Fall 2020
CSE 215 - Programming Language II
Full Marks: 50
Time duration: 60 minutes
[Answer All Questions]

1. **[15 Points]** In Onion Garments Ltd, the employees can be divided into two types based on their way of earning. The first type of employees gets a fixed monthly salary at the end of each month. The salary is calculated by summing basic salary, 30% of the basic salary as house rent, and 5% of basic salary as medical allowance. Employees can also work on an hourly basis who get a salary depending on the number of hours they work in a month. The salary is calculated by multiplying the hours and hourly pay rate. This rate varies from employee to employee.
- a. [5 points] Design a class Employee with its attributes and methods including an abstract method calculateSalary() which calculates the salary of each employee and a protected attribute which keeps the salary amount. Design two classes FixedSalaryEmployee and HourlyRateEmployee that inherit the Employee class. The class descriptions are given in the UML diagram below.
- b. [10 points] The sub-classes have to implement the abstract method calculateSalary(). The toString() method is overridden in the two sub-classes to print the name, mobile number, and salary.



2. **[5 points]** What are the differences between *compiler* and *interpreter*?

3. **[5 points]** Explain the purpose of the following method:

```
static int[] stripZeros( int[] list ) {  
    int count = 0;  
    for (int i = 0; i < list.length; i++) {  
        if ( list[i] != 0 )  
            count++;  
    }  
    int[] newList;  
    newList = new int[count];  
    int j = 0;  
    for (int i = 0; i < list.length; i++) {  
        if ( list[i] != 0 ) {  
            newList[j] = list[i];  
            j++;  
        }  
    }  
    return newList;  
}
```

4. **[5 points]** Describe Implicit and Explicit casting in the context of the object type. Why is casting necessary?

5. **[5 points]** Can you prevent overriding a method without using the final modifier? Describe with code.

6. **[5 points]** Explain with code examples: Java does not mandate you to write code to catch unchecked exceptions.

7. **[5 points]** Can abstract class implement an interface in Java? Do they require to implement all methods of the interface?

8. **[5 points]** This is free marks. To get it, you must ensure all the rules below:

- a. You must upload one single PDF with the name YourName_StudentID.pdf.
- b. Each page should be in portrait mode.
- c. Each page must be clear with sufficient light containing no blurry image.
- d. You must have one single submission. Delete and resubmit is not allowed.
- e. Each page must have a page number. All pages must be in sequence 1, 2, 3, ...
- f. Answers to any question must start from the beginning of the page.
- g. Student information (Name, Student ID, and Section No.) to be mentioned on page 1.