RIT | Golisano College of Computing and Information Sciences
School of Information

ISTE-120 - Computational Problem Solving for the Information Domain I
Homework Assignment 12 (HW12)

This homework assignment presents an application problem and some high-level requirements. Low-level specifications are not given but must be determined using one's background in the topic. This is a common situation in the workplace. This assignment also provides an opportunity to design code with clarity and readability in mind, also extremely important in the workplace. Remember **ALL** input/output is to be done from the main **Payroll** class.

Problem

Super Employer Inc. has two different types of employees with some basic features in common but different methods of calculating pay. It is also likely that other employee types may be added in the future. Write an interface that specifies constants and functions that all the employees must contain. Then write classes that implement the interface class. Finally, write a test class. Details follow:

Interface: `Company`

- Constants:
  - Company Name: Super Employer Inc.
  - Company Address: Rochester, NY
  - Weeks paid: 52
- Methods:
  - `setPay` - accepts a double, returns nothing
  - `calcAnnualPay` - accepts nothing, returns a double
  - `calcWeeklyPay` - accepts nothing, returns a double

Class: `Salaried` implements `Company`

- Constants:
  - Health Insurance Deduction: 125.50
- Attributes:
  - `name`: string
  - `ssn` (Social Security Number): string
  - Others as needed by the methods below
- Methods:
  - Accessors and mutators for the attributes:
  - `setPay` - accepts annual salary amount
  - `calcAnnualPay` - returns:

```
annualSalary – (#_weeksPaid * healthInsDeduction)
```

  - `calcWeeklyPay` - returns weekly pay:

```
(annualSalary / weeks_paid) – healthInsDeduction
```

  - `toString` - returns a formatted string summarizing the employees' information

Class: `Hourly` implements `Company`

Constants:

Standard hours: 40

Overtime rate: 1.5

Attributes:

`name`: string

`ssn` (Social Security Number): string

Average hours worked per week (`avgHoursPerWeek`): double

Others as needed by the methods below

Methods:

Accessors and mutators for the attributes:

`setPay` - accepts `hourlyRate`

`calcAnnualPay` - `hourlyRate * STANDARD_HOURS * weeksPaid`

`calcWeeklyPay` - if `avgHoursPerWeek <= STANDARD_HOURS` then return:

```
(avgHoursPerWeek * hourlyRate)
```

else return:

```
(STANDARD_HOURS * hourlyRate) +
    ((avgHoursPerWeek - STANDARD_HOURS) * hourlyRate * OVERTIME_RATE)
```

`toString` - returns a formatted string summarizing the employees' information

Class: `Payroll`

`main()`:

1. presents a menu to user to create, manage, and report on employees
2. validates that inputs are reasonable:
   - dollar amounts greater than zero
   - hours worked are > 15 and < 60
   - valid menu choice and employee type specifications
3. keeps track of employees
   - if more than one employee, prompt user for which employee
   - if only one employee, no prompt for employee

Note: To return a **formatted string** from a `toString`, a good option is to use the `String.format()` method.

Example of use (this is not the exact code to use for this homework):

```
String returnVal = String.format(
   "Name:    %s %n Salary:   %,10.2f %n",
   getName(), getSalary());

return returnVal;
```

Sample Execution: (Not all types of errors are shown):

```
 ----jGRASP exec: java Payroll

What do you want to do?
      1  Create a new employee
      2  Set pay
      3  Show weekly pay
      4  Show annual pay
      5  Show summary
      6  Quit
==>0

ERROR Bad option, please try again.

What do you want to do?
      1  Create a new employee
      2  Set pay
      3  Show weekly pay
      4  Show annual pay
      5  Show summary
      6  Quit
==>1

What type of employee would you like to create (Salaried or Hourly)? xyz

***Please enter either 'salaried' or 'hourly'.

What type of employee would you like to create (Salaried or Hourly)? salaried

Please enter the name: John Smith

Please enter the social security number: 123-23-4567

Please enter the annual pay: 57000

==> Employee 1 has been created.

What do you want to do?
      1  Create a new employee
      2  Set pay
      3  Show weekly pay
      4  Show annual pay
      5  Show summary
      6  Quit
==>1

What type of employee would you like to create (Salaried or Hourly)? hourly

Please enter the name: Mary Jones

Please enter the social security number: 987-87-6543

Please enter the hourly rate of pay: 0
***Please enter a number > 0.

Please enter the hourly rate of pay: 19.75
```

```
Please enter the average number of hours worked per week: 0
***Please enter a number > 0.

Please enter the average number of hours worked per week: 41

==> Employee 2 has been created.

What do you want to do?
      1  Create a new employee
      2  Set pay
      3  Show weekly pay
      4  Show annual pay
      5  Show summary
      6  Quit
==>2

Which employee do you wish to use (enter 1 to 2)?
0
***ERROR Please enter an employee number from 1 to 2:

Which employee do you wish to use (enter 1 to 2)?
1

How much would you like to set the annual pay to? 0
***ERROR Please enter an amount > 0

How much would you like to set the annual pay to? 65000


What do you want to do?
      1  Create a new employee
      2  Set pay
      3  Show weekly pay
      4  Show annual pay
      5  Show summary
      6  Quit
==>3

Which employee do you wish to use (enter 1 to 2)? 2

The weekly pay is $819.63

What do you want to do?
      1  Create a new employee
      2  Set pay
      3  Show weekly pay
      4  Show annual pay
      5  Show summary
      6  Quit
==>4

Which employee do you wish to use (enter 1 to 2)? 1

The annual pay is $58474.00

What do you want to do?
```

```
      1  Create a new employee
      2  Set pay
      3  Show weekly pay
      4  Show annual pay
      5  Show summary
      6  Quit
==>5

Which employee do you wish to use (enter 1 to 2)? 1

Name: John Smith
SSN:  123-23-4567
     Annual salary:  $  65000.00
     Annual Pay:     $  58474.00
     Weekly Pay:     $   1124.50


What do you want to do?
      1  Create a new employee
      2  Set pay
      3  Show weekly pay
      4  Show annual pay
      5  Show summary
      6  Quit
==>5

Which employee do you wish to use (enter 1 to 2)? 2

Name: Mary Jones
SSN:  987-87-6543
     Average Hours worked         41.00
     Hourly Rate:           $     19.75
     Average Weekly Pay:    $    819.63
     Average Annual Pay:    $  42620.50



What do you want to do?
      1  Create a new employee
      2  Set pay
      3  Show weekly pay
      4  Show annual pay
      5  Show summary
      6  Quit
==>6

 ----jGRASP: operation complete.
```

Submission

Zip your java and class files then submit the zip file to the Homework 12 Assignment folder in MyCourses. Make sure you include the test classes from unit testing.

Name _____

Program	Point Value	Points Earned
- Company Interface		
• Interface properly declared	3	
• Properly declared constants	3	
• Required method declarations	3	
- Hourly Class		
• Implements interface	2	
• Default Constructor	2	
• Properly declared constant(s)	2	
• Properly declared class variable(s)	2	
• Concrete implementation of required methods	7	
- Salaried Class		
• Implements interface	2	
• Default Constructor	2	
• Properly declared constant(s)	2	
• Properly declared class variable(s)	2	
• Concrete implementation of required methods	7	
- Payroll Class		
• Menu loop	4	
• Uses an ArrayList to store multiple accounts	4	
• Creates new employees with validation	9	
• Handles setting pay with validation	9	
• Shows weekly pay	9	
• Shows annual pay	4	
• Prompts for employee only if more than 1 employee	4	
- Unit testing		
• All Hourly class methods are tested	4	
• Hourly test results are correct	5	
• All Salaried class methods are tested	4	
• Salaried test results are correct	5	
Total	100	
Deductions	**Value**	**Deducted**
- JavaDoc Header Comments	0-5	
- Section Comments	0-5	
- Variable Comments	0-5	
- White Space	0-5	
- Indentation	0-5	
- Variable Names	0-5	
- Method Names	0-5	
Total Points	**100**	

Comments: