

Homework – Payroll Application

AYJ Cooperation has two types of employees, full-time and part-time. On their record, each employee has an employee number, first name and last name.

Full-time and part-time staffs work under different contracts. Here are the details of each contract:

Full-time staffs

Full-time staffs are hired with a yearly (12 months) salary. They are paid monthly. Each of them is given 20 sick days per year.

Part-time staffs

Part-time staffs are hired with an hourly rate. Each of them is assigned a certain number of hours per month (same every month). They do not have any sick day benefit, i.e., they do not get paid for the days they are absent.

You are creating a payroll application for AYJ Co., which stores information of all employees. It should have the following functionalities:

- list all employees (employee number, name, full time / part time)
- enter sick day(s) for a specific employee, the smallest unit of sick day is 0.5
 - full-time staffs – deduct the sick days from their yearly sick days. If no more sick days are left, print out a warning message
 - part-time staffs – add to their number of sick days taken. When the monthly pay stub is printed, these days will be converted into hours (8 hours per day) and deducted from their assigned hours to calculate their pay.
- print monthly pay stub for all employees, depending on the type of the staff, different information is shown on the pay stub
 - full time – amount earned, number of sick days left
 - part time – number of hours worked, amount earned
- reset yearly sick day for full-time staffs
- reset monthly sick day taken info for part-time staffs
- save employee information to file
- load employee information from file
- output the average salary of full-time staffs
- output the average hourly rate of part-time staffs
- output the full-time staff who has taken the most sick day in the current year
- output the part-time staff who has taken the most sick day in the current month

Design

The payroll application can be modeled with the following classes:

- **Employee** abstract class
Fields: employeeNumber, firstName, lastName
Methods:

constructor – initializes all fields of the `Employee` object
pay – an abstract method that returns an employee's pay
deductSickDay – an abstract method that updates the sick day information for an employee
resetSickDay – an abstract method that resets the sick day information for an employee
printPayStub – an abstract method that prints (display on screen) the monthly pay stub of an employee
toString – return a string with employee number, first name and last name

- **FullTimeStaff** class, which is a subclass of `Employee`

Fields: `yearlySickDay` (class constant) `yearlySalary`, `sickDaysLeft`

Methods:

constructor – initializes all fields of the `FullTimeStaff` Object
pay – returns the amount earned monthly based on the yearly salary
deductSickDay – updates the number of sick day left for the employee
resetSickDay – resets number of sick day left to the yearly allowance
printPayStub – prints (on screen) the pay stub for the employee
compareToSickDay – compares the number sick day left between two employees
toString – returns a string with employee number, name and title

- **PartTimeStaff** class, which is a subclass of `Employee`

Fields: `numHoursAssigned`, `hourlyRate`, `sickDaysTaken`

Methods:

constructor – initializes all fields of the `PartTimeStaff` Object
pay – returns the amount earned based on the hourly rate and the number of hours worked (assigned hours – sick days taken)
deductSickDay – update the number of sick days taken by the employee
resetSickDay – resets number of sick day taken to 0
printPayStub – prints (on screen) the pay stub for the employee
compareToSickDay – compare the number sick day taken between two employees
toString – returns a string with employee number, name and title

- **Payroll** class, which store the list of employee

Fields: `staffList`

Methods:

`listAllEmployee` – lists all employee (employee number, name)
`enterSickDay` – updates sick day information for the employee specified by the employee number

`printAllPayStubs` – prints on screen the pay stub (for the currently month) for all employees
`saveStaffList` – saves employee information to the specified file
`loadStaffList` – loads employee information from the specified file
`averageSalary` – calculates (and returns) the average salary of all full-time staffs
`averageHourlyRate` – calculates (and returns) the average hourly rate of all part-time staffs
`mostAbsentFullTime` – determines (and returns) the full-time staff with the most absence in the current year
`mostAbsentPartTime` – determines (and returns) the part-time staff with the most absence in the current month
`yearlySickDayReset` – resets the yearly sick day information for all full-time staffs
`monthlySickDayReset` – resets the monthly sick day information for all part-time staffs

- **PayrollRunner** class

- Methods:

- `main` – displays the main menu (listing all options as listed above), and perform the function as requested by user

