SOEN 6441 Winter 2023 section WW: Assignment 1

Due: as indicated on Moodle

You can work alone or in pairs; no credit will be given for bigger groups.

Objectives:

- Get familiar with the developing environment at Concordia
- Get familiar with Java
- Review inheritance
- Review interfaces
- Review polymorphism
- Static attributes
- Static methods

You are given the task to develop a piece of software to manage the Accounts Payable of a small size company. This company has ten employees. Five of them are full-time permanent employees. These employees are paid a fixed salary. The other five are part-timers. They are paid per hour. The formula to calculate their monthly salary is:

Monthly salary = number of hours worked in the month * an hourly rate

The hourly rate varies from one part-timer to another based on his/her echelon. The following table indicates the hourly rate of each echelon

Echelon	Hourly rate
1	15$
2	20
3	25
4	30
5	40

All employees have the following attributes: First name, Last name, age (int), ID (int).

Echelon, hourly rate, and number of hours worked per month are only for part-timers.

The system you are developing should also keep track of all bills that need to be paid. For example, the hydro bill, the gas bill, and many more. Each bill should have the name of the company it belongs to (for example, Hydro Quebec), the amount to be paid (double), and the due date. The date is represented in the form of Month (string), day (int from 1 to 31), and year (int).

At the end of each month, the system you are developing should issue the pay cheques of all employees and all bills.

Requirements:

- Have only **one** array of all employees and bills
- Use polymorphism to loop on all object in the array to issue the cheques
- No need for accessors or mutators for now. A parameterized constructor is enough to fill each object with values of all the attributes. **If you feel you need any accessor or mutator, feel free to develop it.**
- When you display a cheque on the screen, make sure to display the following info:
  * cheque number (just a sequential number)
  * the name the cheque is payable to
  * the amount of the cheque
- The system displays the following menu:
  1. Add an employee
  2. Add a bill
  3. Issue cheques
  4. Exit

Submission:

You must submit:

- A proper **detailed UML class diagram** in **pdf format** that shows
  * names and access modifiers of all attributes,
  * names, parameters, and access modifiers of all methods including constructors
  * proper relations between classes and interfaces
- **Sample runs** of the program that show all the functionalities required in **pdf format**
- **The code** itself

You will give a demo of your assignment to the TA. If working in a group of 2, both students must be present during the demo. No credit will be given without a demo. Any student should be able to answer questions about any part of the assignment.

Grading Rubric

UML diagram	2 marks	Proper notation
Proper use of inheritance	2 marks	
Proper use of static methods	2 marks	
Proper use of polymorphism	2 marks	
Overall code quality	2marks	Indentation/ comments / method names / variable names / class names

0 credit will be given if:

1- No UML is submitted. It is a must to submit the detailed UML class diagram OR
2- The code does not compile OR
3- No demo

One submission per group please. In the Moodle submission comment, please indicate the names and the ID's of the team members worked on the project. -2 if this information is not given accurately.