A. The following sequence diagram is incomplete. Re-draw the diagram so that it follows UML synatx rules.

In your diagram, do the following:

• Include message numbering

• Use proper UML syntax for the objects displayed at the top.

• Incidate looping wherever it occurs with Iteration markers

Diagram

Description automatically generated

B. Create a sequence diagram based on the flow that occurs when an actor invokes the checkoutBook() method on CheckoutForm

Diagram

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C. Objectives:

· Practice implementing and using polymorphic methods.

· Understand how the Template Method design pattern works.

Human Resource Application:

The HR department has identified three types of Employees based on how they are paid: Hourly,

Salaried, and Commissioned. The paycheck for each type is calculated differently:

· Hourly employees are paid monthly and their paycheck amount is calculated based on

their hourly wage and the hours per week they work. For simplicity just assume four

weeks for each month.

· Salaried employees are paid monthly and their paycheck amount is a fixed amount every

month.

· Commissioned employees are also paid monthly. They receive a small base salary, plus

a percentage (commission) on the total value of all orders they sold during the previous

month.

Tasks:

1. Add a concrete calcCompensation() method to Employee.

a. This method takes the month and year as arguments for which to calculate the

compensation.

b. For hourly and salaried employees the amount is the same every mont h.

c. For Commissioned employees the amount depends on the orders they sold that

month.

2. The Employee.calcCompensation() method delegates to the respective derived

class to calculate the gross pay amount by invoking the abstract

Employee.calcGrossPay() method.

3. The Employee.calcCompensation() method then calculates the FICA, state & local

taxes, medicare and social security contributions based on the gross pay. Assume the

following fixed tax percentages:

· FICA is 23%

· State tax is 5%

· Local tax is 1%

· Medicare is 3%

· Social Security is 7. 5%

Important details about the UML class diagram:

· Paycheck class are immutable, i.e. all data needs to be pas sed to the constructor and

no setter methods should be provided.

· Employee is an abstract class!

· Employee.calcCompensation() returns a Paycheck object!

· In order to calculate the paycheck for a Commissioned employee you need to access all

the Order objects that each Commissioned employee is responsible for and add up the

order amount of all orders during a given month.

The code for this is provided in the zip file accompanying the assignment attachments.

D. Create a sequence diagram for the problem described in Lab 4, Part C. Create a distributed control solution. As you distribute control, make sure that the object that handles a step of processing really should be responsible for that behavior, based on the purpose of the class that was determined in the class diagram.

The UML diagram below shows calcCompensation Sequence diagram for a single subclass of “Employee”, “Salaried”.

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