

Object Oriented Programming

Home Work 10

Marks 10

Instructions

Work on this home work individually. Absolutely NO collaboration is allowed. Any traces of plagiarism would result in a ZERO marks in this homework and possible disciplinary action. Tasks should be coded in C++.

Due Date

Paste the solution of the problem (source code .cpp file only) labeled with your complete roll number in SEM – HW 10 and SEA – HW 10 folders for SE Morning and SE Afternoon sections respectively on Thursday, May 19, 2016 before 05:00 PM. These folders are available at \\printsrv\Teacher Data\Umaisr Babar\Students.

1. ADT: NumDays

Design a class called **NumDays**. The class's purpose is to store a value that represents a **number of work hours** and **convert** it to a **number of days**.

For example, 8 hours would be converted to 1 day, 12 hours would be converted to 1.5 days, and 18 hours would be converted to 2.25 days.

The class should have a **constructor** that accepts a **number of hours**, as well as **member functions for storing and retrieving the hours and days**.

The class should also have the following overloaded operators:

1. **Addition operator (+):** When two **NumDays** objects are added together, the **overloaded + operator** should return the sum of the two objects' hours members.
2. **Subtraction operator (-):** When one **NumDays** object is subtracted from another, the **overloaded - operator** should return the difference of the two objects' hours members.
3. **Prefix and postfix increment operators (++):** These operators should increment the number of hours stored in the object. When incremented, the number of days should be automatically recalculated.
4. **Prefix and postfix decrement operators (--):** These operators should decrement the number of hours stored in the object. When decremented, the number of days should be automatically recalculated.

2. ADT: Time Off

Design a class named **TimeOff**. The purpose of the class is to track an employee's **sick leave**, **vacation**, and **unpaid** time off. It should have, as members, the following instances of the **NumDays** class:

maxSickDays	A NumDays object that records the maximum number of days of sick leave the employee may take .
sickTaken	A NumDays object that records the number of days of sick leave the employee has already taken .
maxVacation	A NumDays object that records the maximum number of days of paid vacation the employee may take .
vacTaken	A NumDays object that records the number of days of paid vacation the employee has already taken .
maxUnpaid	A NumDays object that records the maximum number of days of unpaid vacation the employee may take .
unpaidTaken	A NumDays object that records the number of days of unpaid leave the employee has taken.

Additionally, the class should have members for holding the **employee's name** and **identification number**. It should have an **appropriate constructor** and **member functions for storing and retrieving data** in any of the member objects.

Input Validation: Company policy states that an employee may not accumulate **more than 240 hours of paid vacation**. The class should not allow the **maxVacation** object to store a value greater than this amount.

3. Personnel Report: A Driver Program

Write a program that uses an instance of the **TimeOff** class you designed above and perform the following

1. The program should ask the user to enter the **number of months an employee has worked for the company**.
2. It should then use the **TimeOff** object to **calculate and display the employee's maximum number of sick leave and vacation days**.

Note: Employees earn 12 hours of vacation leave and 8 hours of sick leave per month.

NOTE: - No submission will be accepted after the due date and time.

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