

O b j e c t O r i e n t e d P r o g r a m m i n g

Homework 06

Marks 10

Instructions

Work on this homework individually. **Absolutely NO collaboration is allowed. Any traces of plagiarism would result in ZERO marks in this homework and possible disciplinary action.** Task should be coded in **C++**. You are strictly **NOT ALLOWED** to include any additional data-members/functions/constructors in your class. **Write the *main* function first and keep testing the functionality of each function once created.**

Due Date

Upload the solution (*source code .cpp file only*) labeled with your complete **roll number** in **capital letters** e.g., **BITF21M000** till **05:00PM Tuesday, May 02, 2023**, in course's [Google classroom](#).

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:

- Addition operator (+):** When two (*left-hand-side and right-hand-side*) **NumDays** objects are added together, the **overloaded + operator** should **return** the sum of the two objects' hours members.
- Subtraction operator (-):** When one **NumDays** object is subtracted from another (*right-hand-side from left-hand-side*), the **overloaded - operator** should **return** the difference of the two objects' hours members.
- 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.
- 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 (*main function*) that uses an instance of the **TimeOff** class you designed above and perform the following.

- The program should ask the user to enter the **number of months an employee has worked for the company**.
- 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.

Failure to abide by the submission instructions will cause a penalty of two marks.

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

B E S T O F L I C K