Tasks (Operator Overloading)

Tasks # 01
Class Distance consists of length in feet and inches. Class Distance contains
  i.   One default constructor
  ii.   One parameterized constructor
  iii.   Function setData () to set the values of feet and inches.
  iv.   Function show () to display

  v.   Overload < operator to compare two distances.
  vi.   Overload += operator in the Distance class.
  vii.   Overload pre and post decrement operators
  viii. Overload assignment operator for Distance class objects
  ix.   Overload the stream insertion & extraction operators (<< , >>) for Time class.

Tasks # 02
Modify the time class from Example in Chapter 12 of DS-Malik Book so that instead of a function add_time(), increment_time() etc it uses the overloaded operators as follows;
  i.   Overload + and - operators in Time class to add and subtract two time objects
  ii.   Overload pre and post increment operators for hour, minute and seconds
  iii.   Overload pre and post decrement operators for hour, minute and seconds
  iv.   **Overload all relational operators in Time class for time objects i.e. >, >=, <, <=, !=**
Write a program to test this class and its functions in main program.

Tasks # 03
Design a class to perform various matrix operations. A matrix is a set of numbers arranged in rows and columns. Therefore, every element of a matrix has a row position and a column position. If A is a matrix of five rows and six columns, we say that the matrix A is of the size 5x6 and sometimes denote it as A_{5x6}. Clearly, a convenient place to store a matrix is in a two-dimensional array. Two matrices can be added and subtracted if they have the same size. Suppose A = $[a_{ij}]$ and B = $[b_{ij}]$ are two matrices of the size m _ n, in which aij denotes the element of A in the ith row and the jth column, and so on. The sum and difference of A and B are given by:

$$A + B = [a_{ij} + b_{ij}]$$

$$A - B = [a_{ij} - b_{ij}]$$

The multiplication of A and B (A * B) is defined only if the number of columns of A is the same as the number of rows of B. If A is of the size mxn and B is of the size nxt, then A *B = $[c_{ik}]$ is of the size mxt and the element c_{ik} is given by the formula:

$$c_{ik} = a_{i1}b_{1k} + a_{i2}b_{2k} + \cdots + a_{in}b_{nk}$$

Design and implement a class matrixType that can store a matrix of any size. Overload the operators +, -, and * to perform the addition, subtraction, and multiplication operations, respectively, and overload the operator << to output a matrix. Also, write a test program to test various operations on the matrices.   Good Luck ☺