National University
of computer and emerging sciences

CL-1004
Object Oriented Programming- Lab
Spring' 2023
BS-SE

Lab Manual 08

Problem 1:

Assuming that a year has 365 days, write a class named DayOfYear that takes an integer representing a day of the year and translates it to a string consisting of the month followed by day of the month. For example,

Day 2 would be January 2.
Day 32 would be February 1.
Day 365 would be December 31.

The constructor for the class should take as parameter an integer representing the day of the year, and the class should have a member function print() that prints the day in the month day format.

The class should have an integer member variable to represent the day. You are going to need global array of string objects that can be used to assist in the translation from the integer format to the month-day format. Overload the following operators for DayOfYear class:

- operator+ (int val) // Adds val into the days and convert into appropriate day of the year

- operator+= (DayOfYear &right) // Adds right into the current object.

- operator-= (DayOfYear &right) // Subtract right into the current object.

- operator= // Copy one object to the other

- operator== //Checks either the two objects are equal or not

- operator++ //post and pre increment operator. These operators should modify the DayOfYear object so that it represents the next day. If the day is already the end of the year, the new value of the object will represent the first day of the year

- operator-- //post and pre decrement operator these operators should modify the DayOfYear object so that it represents the previous day. If the day is already the first day of the year, the new value of the object will represent the last day of the year.

- operator<< prints the day in the month day format.

- operator>> inputs the data member of DayOfYear class.

Problem 2:

Write a class Matrix. This class has three private data members

- rows: An integer that holds the numbers of rows for matrix
- columns: An integer that holds the numbers of columns for matrix
- Ptr: An integer pointer to pointer that points to 2D array (rows x columns).

The class has the following member functions.

1. Matrix (int r, int c) //Parameterized Constructor
Constructor to declare 2D matrix with specific number of rows and column.

2. Bool operator <(const Matrix& right)
Overload < operator to check if current object is less than right object or not

3. Void operator += (const Matrix& right)
Overload Addition operator to Add right object into current object

4. Void operator -= (const Matrix& right)
Overload Subtraction operator to subtract right object into current object

5. Void operator *= (const Matrix& right)
Overload Multiplication operator to multiply right object into current object

6. Matrix operator++ (const Matrix& right)
Overload post increment operator.

Problem 3:

Write a class Polynomial. This class has three private data members

- a: A double that holds the coefficient of X^2
- b: A double that holds the coefficient of X
- c: A double that holds the coefficient of X^0(Constant term)

The class has the following member functions:

- Polynomial()
  Constructs a new Polynomial object to represent the quadratic Polynomial with all coefficients =0
- Polynomial (a,b,c)
  Constructs a new Polynomial object to represent the quadratic Polynomial
- getters/setters
  Write getter/setters for all members e.g. a,b,c
- operator ==
  Compare two polynomial
- Void operator++ ()
  Overload pre increment operator.
- Void operator++ (int)
  Overload post increment operator
- Void operator-- ()
  Overload pre decrement operator.
- Void operator-- (int)
  Overload post decrement operator
- p2*=p1
  Overload Addition operator to Add polynomial object p2 into polynomial object p1
- p2!=p1
  Overload Addition operator to Add integer d into polynomial object p1
- Ostream & operator<< (ostream &os, Polynomial & right)
  Overload << operator to display all three data members in any polynomial object.

- Istream & operator>> (istream & in, Polynomial & right)
  Overload >> operator to take input in data members of polynomial object.