Branch : MCA
Semester : Spring Semester 2022-23
Course Code : CA3205
Laboratory Name : Numerical Computing using C++
Assignement No. : ASSIGNMENT – 3
Assignment Title : Classes and Objects

1) Declare a class **Number** having one data member: **num** and consist of the following member functions.
   i. A default constructor
   ii. A parameterized constructor
   iii. A destructor (that displays the statement “object destroyed for class Num”)
   iv. Accesor functions : getNumber() to return the number
   v. Mutator functions: changeNumber(int) to set the values of the number.
   vi. bool isArmstrong() : to check whether num is an armstrong number.
   vii. bool isPrime() : to test primality of the number
   viii. int nextCoprime() : to compute and return next number in the number series that is coprime with this number.
   ix. int reverse() : to reverse the number

2) Declare a class **Fraction** having two data members; **num** and **denom** indicating numerator and denominator. It consists of the following member functions.
   i. A default constructor
   ii. A parameterized constructor
   iii. A destructor (that displays the statement “object destroyed for class Fraction”)
   iv. Accessor functions : getFraction() to display the number in a/b format
   v. Mutator functions: setFraction(int,int) to set the values of a Fraction.
   vi. addFraction(Fraction,Fraction) : to add two Fraction objects passes as arguments and store the result in the third object that calls the function.
   vii. reduceFraction(Fraction) : to reduce a fraction to its equivalant form.
   viii. divFraction(Fraction,Fraction) : to divide two Fraction objects passed as arguments and store the result in the third object that calls the function.

3) Declare a class **Poin2D** having two data members; xCo & yCo stands for x-coordinate and y-coordinate. The class consists of the following members functions.

i. A default constructor
ii. A parameterized constructor
iii. A destructor (that diplays the statement “object destroyed for class Point2D”)
iv. Accesor functions : getPoint() to display the 2D point in (xCo, yCo) format
v. Mutator functions: setPoint(xco,yco) to set the values of 2D point.
vi. bool insideCircle(int r, Point2D cen) : to check and returns whether the point object that calls this member function is inside the circle defined by the radius r and center cen passed as arguments to this function.
vii. bool checkCollinear(Point2D,Point2D): check whether given three 2D points are collinear .
viii. bool onAxis() : return true is the point is on one of the axis.

4) Declare a class **Time** having three data members; hour, minute, and second in 24 hour format. It consist of the following member functions.

ix. A default constructor
x. A parameterized constructor
xi. A destructor (that diplays the statement “object destroyed for class Time”)
xii. Accesor functions : getTime() prints time in HH:MM:SS AM/PM format.
xiii. Mutator functions: setTime(int,int,int), to set data members where arguments are passed by reference.
xiv. calcTimeDifference(Time, Time) : finds the time difference between two given times and stores the result in the third object that has calls the function.
xv. resetTime() : it sets time to 00:00:00

-end-