

Branch : MCA

Semester : Spring Semester 2022-23

Course Code : CA3205

Laboratory Name : Numerical Computing using C++

Assignment No. : ASSIGNMENT – 4

Assignment Title : copy constructor, static, and friend functions

- 1) Define a class **IntStack** with data members top and a pointer to integers. The class also has the following member functions:
 - i. IntStack() : Default constructor, dynamically allocate memory of 10 integers and set the top to -1.
 - ii. IntStack(size) : Parameterized constructor, dynamically allocate the memory of 'size' integers and set top to -1.
 - iii. IntStack(const IntStack &): copy constructor , create memory for called object , copies the data from argument object , and update top variable.
 - iv. int pop(): pop up and returns the topmost element of the stack.
 - v. void push(int val) : push the value to the stack.

- 2) Define a class **Account** having two nonstatic data members; accountno and balance. It has one static data member totalbal that indicate the total amount of all the accounts. It consists of the following member functions.
 - i. A parameterized constructor, which set the account number and balance.
 - ii. A destructor (that deduct the deleted account balance from the totalbal variable)
 - iii. deposit(amount) : deposit amount to a particular account and also update in the totalbal.
 - iv. withdraw(amount) : withdraw the given amount to a particular account and also update in the totalbal.
 - v. addtobank(amount) : a static member function that add amount to the totalbal
 - vi. deductfrombank(amount) : a static member function that deduct given amount from the totalbal.

- 3) Define a class **Employee** having following data members : empno, doj, and salary. Here, doj is an object of Class MyDate that has day, month, and year as data members. The class consists of the following member functions:
 - i. A parameterized constructor, Employee(int, MyDate, double)
 - ii. A copy constructor, Employee(const Employee&)

iii. setEmpdata(int, MyDate, double): set the data of an employee.

iv. showEmpdata(void) : show the employee's data.

Define a non-member function to calculate and display the tax payable by an employee.

amount < 100000 – no tax

100000 <= amount < 200000 - 10%

200000 <= amount < 500000 – 15%

amount > 500000 – 20%

Make functions **friend** of the required classes wherever necessary.

4. Define a class **Triangle** having following data members : side1, side2, and side3.

Here, side is an object of class Line with only data member len. The class consists of the following member functions:

v. Triangle(Line, Line, Line) : parameterized constructor.

vi. Triangle(const &Triangle) : a copy constructor.

vii. setSide(Line, Line, Line): set the sides of a triangle.

viii. showSides(void) : show the sides of a triangle.

ix. float findArea(void) : returns area of the triangle.

Make functions **friend** of the required class wherever necessary.

-end-