

# C++ Lab Assignment 7

## Basic C++ Coding

Date of Submission: 11/07/2020

1. Write user defined functions for square matrix to calculate
  - a. Left diagonal sum
  - b. Right diagonal sum
2. Write a function in C++ which accepts a 2D array of integers and its size as arguments and displays the elements of middle row and the elements of middle column.  
[Assuming the 2D Array to be a square matrix with odd dimension i.e. 3x3, 5x5, 7x7 etc...]  
Example, if the array contents is

```
3 5 4
7 6 9
2 1 8
```

3. Declare a structure to represent a complex number (a number having a real part and imaginary part). Write C++ functions to add, subtract, multiply and divide two complex numbers.
4. Define a class student with the following specification

**Private members** of class student

admno                      integer  
sname                      20 character  
eng. math, science      float  
total                      float  
ctotal()                  a function to calculate eng + math + science with float return type.

**Public member** function of class student

Takedata()              Function to accept values for admno, sname, eng, science and invoke ctotal() to calculate total.  
Showdata()              Function to display all the data members on the screen.

5. Define a class batsman with the following specifications:

**Private members:**

bcode                      4 digits code number  
bname                      20 characters  
innings, notout, runs      integer type  
batavg                      it is calculated according to the formula –  
                                 batavg = runs / (innings - notout)

calcavg()                  Function to compute batavg

**Public members:**

readdata()              Function to accept value from bcode, name, innings, notout and invoke the function calcavg()  
displaydata()            Function to display the data members on the screen.

6. Define a class TEST in C++ with following description:

**Private Members**

TestCode of type integer

Description of type string

NoCandidate of type integer

CenterReqd (number of centers required) of type integer

A member function CALCNTR() to calculate and return the number of centers as (NoCandidates/100+1)

**Public Members**

- A function SCHEDULE() to allow user to enter values for TestCode, Description, NoCandidate & call function CALCNTR() to calculate the number of Centres

- A function DISPTST() to allow user to view the content of all the data members

7. Define a class in C++ with following description:

**Private Members**

A data member Flight number of type integer

A data member Destination of type string

A data member Distance of type float

A data member Fuel of type float

A member function CALFUEL() to calculate the value of Fuel as per the following criteria

Distance	Fuel
<=1000	500
more than 1000 and <=2000	1100
more than 2000	2200

**Public Members**

A function FEEDINFO() to allow user to enter values for Flight Number, Destination, Distance & call function CALFUEL() to calculate the quantity of Fuel

A function SHOWINFO() to allow user to view the content of all the data members

8. Define a class BOOK with the following specifications :

**Private members** of the class BOOK are

BOOK NO integer type

BOOKTITLE 20 characters

PRICE float (price per copy)

TOTAL\_COST() A function to calculate the total cost for N number of copies where N is passed to the function as argument.

**Public members** of the class BOOK are

INPUT() function to read BOOK\_NO. BOOKTITLE, PRICE

PURCHASE() function to ask the user to input the number of copies to be purchased. It invokes TOTAL\_COST() and prints the total cost to be paid by the user.

Note : You are also required to give detailed function definitions.

9. Define a class REPORT with the following specification:

**Private members :**

adno 4 digit admission number

name 20 characters

marks an array of 5 floating point values

average average marks obtained

GETAVG() a function to compute the average obtained in five subject

**Public members:**

READINFO() function to accept values for adno, name, marks. Invoke the function

GETAVG()

DISPLAYINFO() function to display all data members of report on the screen.

You should give function definitions.

10. Write the definition for a class called **Rectangle** that has floating point data member's length and width. The class has the following member functions:
- void setlength(float)** to set the length data member
  - void setwidth(float)** to set the width data member
  - float perimeter()** to calculate and return the perimeter of the rectangle
  - float area()** to calculate and return the area of the rectangle
  - void show()** to display the length and width of the rectangle
  - int sameArea(Rectangle)** that has one parameter of type Rectangle. sameArea returns 1 if the two Rectangles have the same area, and returns 0 if they don't.
- a. Write the definitions for each of the above member functions.
  - b. Write main function to create two rectangle objects. Set the length and width of the first rectangle to 5 and 2.5. Set the length and width of the second rectangle to 5 and 18.9. Display each rectangle and its area and perimeter.
  - c. Check whether the two Rectangles have the same area and print a message indicating the result. Set the length and width of the first rectangle to 15 and 6.3. Display each Rectangle and its area and perimeter again. Again, check whether the two Rectangles have the same area and print a message indicating the result.