Software Development Lab – II [15B17CI271]
Assignment Sheet
<u>Week 1</u>

COURSE OUTCOMES		COGNITIVE LEVELS
C173.1	Write programs in C++ to implement OOPs concepts related to objects, classes, constructor, destructor, and friend function.	Apply Level (Level 3)
C173.2	Write programs in C++ using OOPs concept like encapsulation, inheritance, polymorphism and abstraction.	Apply Level (Level 3)
C173.3	Write programs in C++ using Standard Template Library.	Apply Level (Level 3)
C173.4	Perform exception handling in C++ programs.	Apply Level (Level 3)
C173.5	Write MySQL queries to perform operations like ADD, DELETE, UPDATE, SELECT on relational databases.	Apply Level (Level 3)

Note: **Students are advised to submit their solutions to respective lab faculty. The solution file must be named as "rollno_first name_w1.doc" (here w1 represents week1).**

Q.1 WAP using C++ to read three numbers from user and display their sum and average on output screen.

Sample input: Enter any three numbers: 3 5 7

Sample output: Sum is = 15

Average is = 5

Q.2 Write a C++ program to read two numbers from the user and display the larger value on the output screen.

Sample input: Enter any two numbers: 27 60

Sample output: larger number is = 60

Q.3 Write a C++ program to read the values of variables: a, b c and d from user and display the value of x on output screen, where

$$x = a / (b -c) + d$$

Sample input1: Enter the value of a,b,c& d :

250 85 25 2

Sample output1: x=a/(b-c) +d = 6.16667

Sample input2: Enter the value of a,b,c& d :

300 60 60 5

Sample output2: x= Cannot divide by zero Error. Retry with different input

Q4. Given an unsorted array with both positive and negative elements. Find the smallest positive number missing from the array in O(n) time using constant extra space. It is allowed to modify the original array.

Examples:

Input: {2, 3, 7, 6, 8, -1, -10, 15}

Output: 1

Input: { 2, 3, -7, 6, 8, 1, -10, 15 }

Output: 4

Input: {1, 1, 0, -1, -2}

Output: 2

Q5. Smallest prime number missing in an array: Given an array containing n distinct numbers. The task is to find the smallest prime which is not present in the array.

Note: If there is no prime number missing up to the maximum element of the array then print "No prime number missing".

Examples:

Input:arr[] = {9, 11, 4, 2, 3, 7, 0, 1}

Output: 5

5 is the smallest prime, which is not present in array.

Input:arr[] = {3, 0, 2, 5}

Output: No prime number missing

As 5 is the maximum element and all prime numbers upto 5

are present in the array.

Q6. Given a boolean matrix mat[M][N] of size M X N, modify it such that if a matrix cell mat[i][j] is 1 (or true) then make all the cells of ith row and j[th] column as 1.

Example 1

The matrix

1 0

0 0

should be changed to following

1 1

1 0

Example 2

The matrix

0 0 0

0 0 1

should be changed to following

0 0 1

1 1 1

Example 3

The matrix

1 0 0 1

0 0 1 0

0 0 0 0

should be changed to following

1 1 1 1

1 1 1 1

1 0 1 1

Q7: C++ Program to assign data to members of a structure variable and display it.

Example:

Enter Full name: Magdalena Dankova

Enter age: 27

Enter salary: 1024.4

Displaying Information.

Name: Magdalena Dankova

Age: 27

Salary: 1024.4

Q7.1 Modify the program in the following way

Enter Full name: Magdalena Dankova

Enter age: 27

Enter salary components

Basic:_____

HRA:_____

BOOK Allowance:_____

Furniture Allowance: _____

Special allowance:_____

Total salary = sum(basic+HRA+BOOK Allowance+Furniture Allowance+Special allowance)

Q.8 Write a program in C++ to compare individual members of structures.

a)   Create 'phone' structure with Price, Battery Power (In mAH)and Rating (between 0-5) as member variables.

b)   Create two structure variables (Two phone).

c)   Compare both phones and display the better phone w.r.t to each criterion (A better phone is low in price with better Battery Power and high rating).

Sample input: Enter Phone1 details:

 Enter Price:

12000

 Enter Battery Power(In mAh):

4000

 Enter Rating(between 0-5):

3.7

Enter Phone2 details:

 Enter Price:

15000

 Enter Battery Power(In mAh):

4500

 Enter Rating(between 0-5):

4

Sample output: Phone better w.r.t Price is Phone1

Phone better w.r.t Battery Power is Phone2

Phone better w.r.t Rating is Phone2

Q.9 Write a C++ program to read a 2-D matrix from the user and display it in spiral form.

Sample input: Elements of 3 by 6 matrix are: { { 1, 2, 3, 4, 5, 6 },{ 7, 8, 9, 10, 11, 12 },{ 13, 14, 15, 16, 17, 18 } }

Sample output: Elements of matrix in spiral form: 1 2 3 4 5 6 12 18 17 16 15 14 13 7 8 9 10 11