Topic: **In-Lab Practice Session 14**
Course: **CSE1002 – Problem Solving & Object-Oriented Programming**
Date: **23rd April, 2021**

## DMA_StudentDetails

Consider a Class Student with the instance(Data Members) variables Student_Id, Student_Name, Student_Age, Student_CGPA and One Static member College as private.

and two member methods getDetails() and putDetails() to read and write the above said instance variables as public. Write a C++ Program and subsequent pseudocode for the above said class Student to print the sorted list(Descending) of student details based on the CGPA.

Note : Use new() and delete() operators to allocate and deallocate the memory for array of objects.

Make College = "VIT-Chennai" as static.

### Boundary Conditions :

If 'N' is -ve, print "Invalid Input"

### Input:

First line must read the value of 'N' (No. of Students)

Second line onwards read the details of 'N' Students as below

Student_Id, Student_Name, Student_Age, Student_CGPA.

### Output:

List all the Students Details in an Descending order based an CGPA.

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## IPS_DynamicMemory

Write a C program and subsequent pseudocode to find the sum of even numbers and sum of odd numbers separately by defing 2 separate functions Sum_Even() and Sum_Odd() from a given list of integer elements. Use dynamic memory allocation to allocate a memory of array for 'n' elements.

Note :

1. pass 'Array' as an argument in the defined functions Sum_Even(), Sum_Odd().

2. allocate memory dynamically using either malloc() or calloc(). finally relase it using free();

### Input Format:

Array size ('n') followed a list of 'n' elements into an array.

### Output Format:

Sum of Even numbers, Sum of Odd Numbers

**TestCase-1 - Input :** if 'n' = 9, then the list of elements in an array are 1,2,3,4,5,6,7,8,9

**Output :** 20 (i.e - 2+4+6+8), 25 (i.e - 1+3+5+7+9)

**TestCase-2 :** if 'n' is -ve, then print "Invalid Input"

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## IPS_DynamicMemoryAllocation

Snow Howler is the crypto currency expert at the Centre of XYZ laboratory in the city of HuskyLand. His job is to generate the list of prime numbers b/w 'm' and 'n' and store them in an array dynamically. As a friend of Snow Howler, help him by writing a C-Program and Subsequent pseudocode to generate the list of prime nubmers b/w 'm' and 'n'.

**Input :** Read two integers 'm' and 'n'

**Output :** List of Prime numbers b/w 'm' and 'n' and the size of an array.

Note : Use either malloc() or calloc() to allocate a memory dynamically as per the list of prime numbers b/w 'm' and 'n'. Finally use free() to release the memory allocated at the end of the program.

Example : if m=10, and n=30, then the size of an array is '6', because the prime numbers b/w 10 and 30 are 11,13,19, 17, 23, 29 .

**Boundary Conditions :** if 'm' or 'n' or both are -ve, then print "Negative Inputs"

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## DMA_SortElement

Write a program in C++ to sort the array elements in ascending order also display the sorted elements without duplication. Use dynamic memory allocation(new() and delete())

**Input Format:**

Read array size

Read array elements

**Output Format:**

Display the array elements in ascending order without duplicates

Note : if the Size of the Array is -ve, print "Invalid Input"

| Input: | Output: |
|---|---|
| 10 | 1 |
| 3 | 2 |
| 1 | 3 |
| 4 | 4 |
| 3 | 6 |
| 6 | 7 |
| 3 | 9 |
| 7 | 11 |
| 9 | |
| 11 | |
| 2 | |