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Lab Manual : **01**
Course Code : **CSE207**
Course Title : **Data Structures**
Instructor : **Md. Manowarul Islam, Adjunct Faculty, Department of CSE**

Objective:

The objective of this lab is to provide a fundamental idea about the sorting element of an integer array using C programming. At the end of the lab, students are able to know:

- How to take input into an array.
- How to sort the element of the array.

Preliminary:

Bubble sort is a sorting algorithm that compares two adjacent elements and swaps them until they are not in the intended order. We will learn how to take input from the user and find the output.

```
#include<stdio.h>

int main(){

    int a[100];
    int n,i,pos=-1,item;
    printf("Enter number of elements: ");
    scanf("%d",&n);
    printf("Enter your data :");
    for(i=0; i<n;i++)
    scanf("%d",&a[i]);

    printf("Your array :");
        for(i=0; i<n;i++)
        printf("%d\t",a[i]);

    int temp,j;


for(i=0; i<n-1;i++)
    for(j=0;j<n-1-i;j++)
    {
        if(a[j]>a[j+1])
        {
```

```
            temp=a[j];
            a[j]=a[j+1];
            a[j+1]=temp;
        }
    }


    printf("\nYour array :");
        for(i=0; i<n;i++)
        printf("%d\t",a[i]);
    }
```

Lab Task

Exercise 1:

Modify the above code to count the number of pass and swap operation for an array of size N.

Exercise 2

Write a program to find second maximum and minimum number of an integer array. Show the sample input and output clearly.

Sample Input	Sample Output
17, 4,5,6,2,10	Second Maximum: 10 Second Minimum: 4

Exercise 3

We can add, subtract, multiply and divide 2 matrices. To do so, we are taking input from the user for row number, column number, first matrix elements and second matrix elements. Then we are performing any of the operations on the matrices entered by the user. Take the choice from user and show the results accordingly.

$$A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \quad B = \begin{pmatrix} 5 & 6 & 7 \\ 8 & 9 & 10 \end{pmatrix}$$

$$A * B = \begin{pmatrix} 21 & 24 & 27 \\ 47 & 54 & 61 \end{pmatrix}$$

Sample Input	Sample Output
Enter your choice: 1 for addition 2 for subtraction 3 for multiplication 3 Enter the first matrix: 1 1 1 2 2 2 3 3 3 Enter the second matrix 1 1 1 2 2 2 3 3 3	You choose 3 Multiplication: 6 6 6 12 12 12 18 18 18