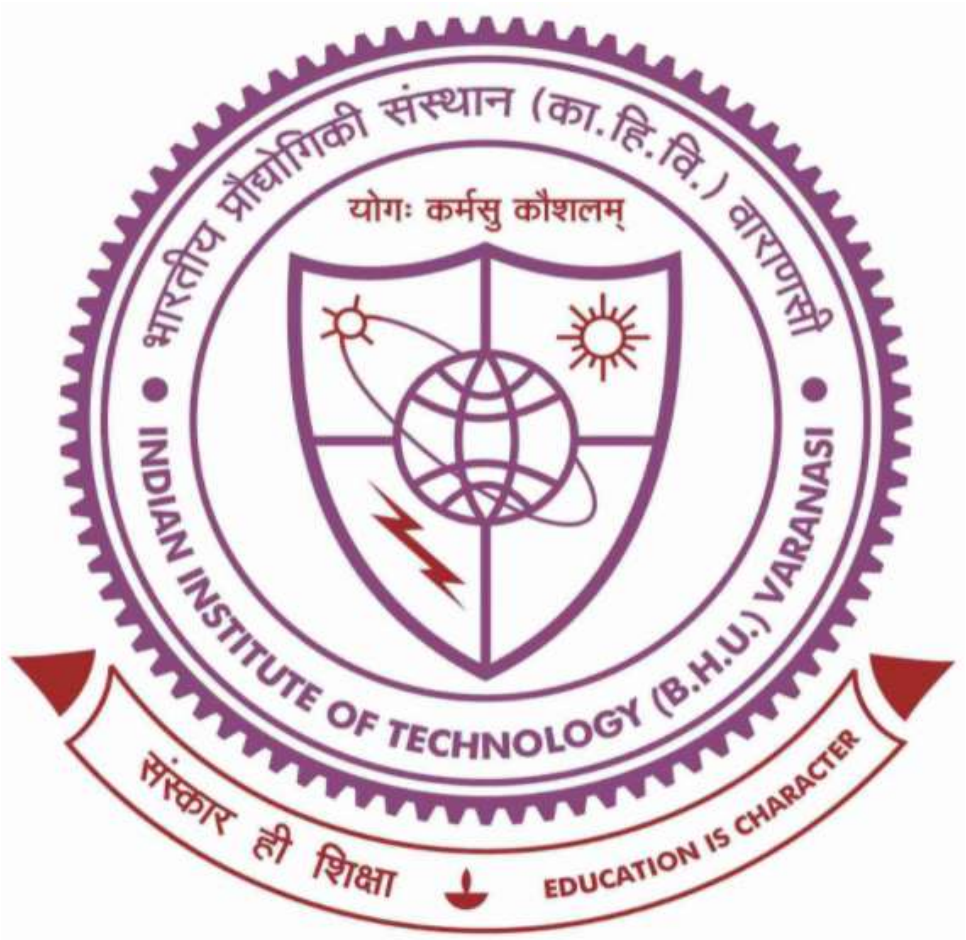

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CSO 101 LAB ASSIGNMENT-5: INTEGER ARRAYS

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SOLUTIONS

1) Write a program in C to store elements in an array and print it.

CODE:

```c
#include <stdio.h>
int main()
{
    int i, n;
    printf("Enter array length : \n");
    scanf("%d",&n);
    fflush(stdin);
    int arr[n];
    printf("Enter elements of array:- \n");
    for (i = 0; i < n; i++)
    scanf("%d", &arr[i]);
    fflush(stdin);
    printf("\n");
    printf("The elements of the array are:- \n");
    for (i = 0; i < n; i++)
    printf("%d\n",arr[i]);
    return 0;
}
```

OUTPUT:

```
Enter array length :
6
Enter elements of array:-
12 31 21 1 2 3

The elements of the array are:-
12
31
21
1
2
3
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5>
```

2) Write a program in C to find the sum of all elements of an array.

CODE:

```c
#include <stdio.h>
int main()
{
    int i, n,sum=0;
    printf("Enter array length : \n");
    scanf("%d",&n);
    fflush(stdin);
    int arr[n];
    printf("Enter elements of array:- \n");
    for (i = 0; i < n; i++)
    scanf("%d", &arr[i]);
    fflush(stdin);
    printf("\n");
    for (i = 0; i < n; i++)
    sum=sum+arr[i];
    printf("The sum of elements of the array is= %d\n", sum);
    return 0;
}
```

OUTPUT:

```
Enter array length :
4
Enter elements of array:-
1 2 3 4

The sum of elements of the array is= 10
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5>
```

3) Write a program in C to find the maximum and minimum element in an array.

CODE:

```c
#include <stdio.h>
int main()
{
    int i, n;
    printf("Enter array length : \n");
    scanf("%d",&n);
    fflush(stdin);
    int arr[n];
    printf("Enter elements of array:- \n");
    for (i = 0; i < n; i++)
    scanf("%d", &arr[i]);
    fflush(stdin);
    int max=arr[0],min=arr[0];
    printf("\n");
    for (i = 1; i < n; i++)
    {
        if (arr[i]<min)
        min=arr[i];
        if (arr[i]>max)
        max=arr[i];
    }
    printf("Maximum and minimum element of the array are= %d and %d
respectively.\n", max,min);
    return 0;
}
```

OUTPUT:

```
Enter array length :
5
Enter elements of array:-
12 3 67 45 5

Maximum and minimum element of the array are= 67 and 3 respectively.
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5>
```

4) Write a program in C to count the frequency of each element of an array.

CODE:

```c
#include <stdio.h>
int main()
{
    int i, n;
    printf("Enter array length : \n");
    scanf("%d",&n);
    fflush(stdin);
    int arr[n];
    printf("Enter elements of array:- \n");
    for (i = 0; i < n; i++)
    scanf("%d", &arr[i]);
    fflush(stdin);
    printf("\n");
    for (int i=0;i<n;i++)
    {
        for (int j=0;j<(n-i-1);j++)
        {
            if (arr[j]>arr[j+1])
            {
                int temp=arr[j];
                arr[j]=arr[j+1];
                arr[j+1]=temp;
            }
        }
    }
    for (i = 0; i < n; i++)
    {
        int c=0;
        for (int j=0;j<n;j++)
        {
            if (arr[i]==arr[j])
            c=c+1;
        }
        printf("The frequency of %d is= %d\n",arr[i],c);
        i=i+c-1;
    }
    return 0;
}
```

OUTPUT:

```
Enter array length :
6
Enter elements of array:-
1 2 3 4 3 2

The frequency of 1 is= 1
The frequency of 2 is= 2
The frequency of 3 is= 2
The frequency of 4 is= 1
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5>
```

5) Write a program in C to find the mean, median and mode of the elements of an array.

CODE:

```c
#include <stdio.h>
int main()
{
    int i, n;
    printf("Enter array length : \n");
    scanf("%d",&n);
    fflush(stdin);
    int arr[n];
    printf("Enter elements of array:- \n");
    for (i = 0; i < n; i++)
    scanf("%d", &arr[i]);
    fflush(stdin);
    printf("\n");
    //sorting the array
    for (int i=0;i<n;i++)
    {
        for (int j=0;j<(n-i-1);j++)
        {
            if (arr[j]>arr[j+1])
            {
                int temp=arr[j];
                arr[j]=arr[j+1];
                arr[j+1]=temp;
            }
        }
    }
```

```c
    //mode of the array elements
    int max=0,num=0,mode;
    for (i = 0; i < n; i++)
    {
        int c=0;
        for (int j=0;j<n;j++)
        {
            if (arr[i]==arr[j])
            c=c+1;
        }
        if (c>max){
            max=c;
            num=arr[i];
        }
        i=i+c-1;
    }
    mode=num;
    //mean of the array elements
    int sum=0;
    float mean;
    for (i = 0; i < n; i++)
    sum=sum+arr[i];
    mean=((float)sum)/n;
    //median of the array elements
    float median;
    if (n%2==0)
    median=(arr[((n)/2)-1]+arr[(n/2)])/2.0;
    else
    median=(arr[((n)/2)-1]);
    printf("Mean, Median and Mode of the elemnts of the array are
respectively:- %f %f %d\n",mean,median,mode);
    return 0;
}
```

OUTPUT:

```
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5> cd "c:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5\" ; if ($?) { gcc q5.c -o q5 } ; if ($?) {
 .\q5 }
Enter array length :
5
Enter elements of array:-
2 4 5 2 6

Mean, Median and Mode of the elemnts of the array are respectively:- 3.800000 4.000000 2
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5> cd "c:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5\" ; if ($?) { gcc q5.c -o q5 } ; if ($?) {
 .\q5 }
Enter array length :
8
Enter elements of array:-
25 12 5 24 15 22 23 25

Mean, Median and Mode of the elemnts of the array are respectively:- 18.875000 22.500000 25
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5>
```

6) Write a program in C to separate odd and even integers in separate arrays.

CODE:

```c
#include<stdio.h>
int main()
{
    int i,n,ce=0,co=0;
    printf("Enter a number: ");
    scanf("%d",&n);
    fflush(stdin);
    int arr[n];
    printf("Enter elemnts: ");
    for (i = 0; i < n; i++)
    scanf("%d", &arr[i]);
    fflush(stdin);
    for (int j=0;j<n;j++)
    {
        if (arr[j]%2==0)
        ce=ce+1;
        else
        co=co+1;
    }
    int arro[co],arre[ce];
    int co1=0,ce1=0;
    for (int j=0;j<n;j++)
    {
        if (arr[j]%2==0)
        {
            arre[ce1]=arr[j];
            ce1=ce1+1;
        }
        else
        {
            arro[co1]=arr[j];
            co1=co1+1;
        }
    }
    printf("\n");
    printf("The array containing odd elements are :- \n");
    for (i = 0; i < co; i++)
    printf("%d ",arro[i]);
    printf("\n");
    printf("The array containing even elements are :- \n");
    for (i = 0; i < ce; i++)
    printf("%d ",arre[i]);
```

```
    return 0;
}
```

OUTPUT:

```
Enter a number: 5
Enter elemnts: 1 3 2 6 5

The array containing odd elements are :-
1 3 5
The array containing even elements are :-
2 6
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5>
```

7) Write a program in C to display the Fibonacci series up to the 10th term.

CODE:

```
#include<stdio.h>
int main()
{
    int i,n;
    printf("Enter a number: ");
    scanf("%d",&n);
    fflush(stdin);
    int a=0,b=1;
    int arr[n];
    arr[0]=a;
    arr[1]=b;
    for (i=2;i<n;i++)
    {
        int c=a+b;
        a=b;
        b=c;
        arr[i]=c;
    }
    printf("\n");
    printf("The Fibonacci series till the required position is:- \n");
    for (i = 0; i < n; i++)
    printf("%d ",arr[i]);
    return 0;
}
```

OUTPUT:

```
Enter a number: 10

The Fibonacci series till the required position is:-
0 1 1 2 3 5 8 13 21 34
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5>
```

8) Write a program in C to sort a set of integers in ascending order.

CODE:

```c
#include<stdio.h>
int main()
{
    int i, n;
    printf("Enter array length : \n");
    scanf("%d",&n);
    fflush(stdin);
    int arr[n];
    printf("Enter elements of array:- \n");
    for (i = 0; i < n; i++)
    scanf("%d", &arr[i]);
    fflush(stdin);
    printf("\n");
    for (int i=0;i<n;i++)
    {
        for (int j=0;j<(n-i-1);j++)
        {
            if (arr[j]>arr[j+1])
            {
                int temp=arr[j];
                arr[j]=arr[j+1];
                arr[j+1]=temp;
            }
        }
    }
    printf("The sorted elements of the array are:- \n");
    for (i = 0; i < n; i++)
    printf("%d ",arr[i]);
    return 0;
}
```

OUTPUT:

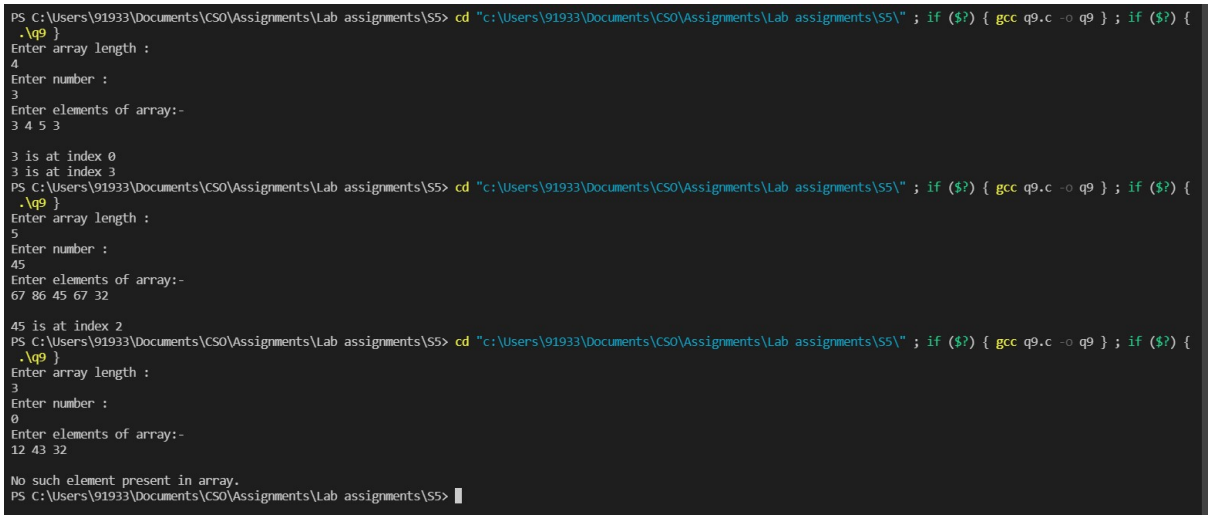
```
Enter array length :
7
Enter elements of array:-
12 32 1 4 56 3 1

The sorted elements of the array are:-
1 1 3 4 12 32 56
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5>
```

9) Write a program in C to input an integer array and an integer and find the index of the integer in the array.

CODE:

```c
#include<stdio.h>
int main()
{
    int i, n,num;
    printf("Enter array length : \n");
    scanf("%d",&n);
    fflush(stdin);
    printf("Enter number : \n");
    scanf("%d",&num);
    fflush(stdin);
    int arr[n];
    printf("Enter elements of array:- \n");
    for (i = 0; i < n; i++)
    scanf("%d", &arr[i]);
    fflush(stdin);
    printf("\n");
    int l[n],c=0;
    for (i = 0; i < n; i++)
    {
        if (arr[i]==num)
        {
        printf("%d is at index %d\n", num,i);
        c=c+1;
        }
    }
    if (c==0)
    printf("No such element present in array.");
    return 0;
}
```

OUTPUT:



10) Write a program in C to find the product of two matrices.

CODE:

```c
#include <stdio.h>
int main()
{
    int p, q, m, n;
    printf("Enter row p and column q for array 1, and row m and
column n for array 2 : \n");
    scanf("%d %d %d %d", &p, &q, &m, &n);
    fflush(stdin);
    if (q != m)
        printf("Matrix multiplication not possible. \n");
    else
    {
        int ar1[p][q];
        int ar2[m][n];
        printf("Enter matrix 1: \n");
        for (int i = 0; i < p; i++)
        {
            for (int j = 0; j < q; j++)
            {
                printf("Enter value for disp[%d][%d]:", i, j);
                scanf("%d", &ar1[i][j]);
                fflush(stdin);
            }
        }
        printf("Enter matrix 2: \n");
        for (int i = 0; i < m; i++)
```

```
        {
            for (int j = 0; j < n; j++)
            {
                printf("Enter value for disp[%d][%d]:", i, j);
                scanf("%d", &ar2[i][j]);
                fflush(stdin);
            }
        }
        int res[p][n];
        for (int i = 0; i < p; i++)
        {
            for (int j = 0; j < n; j++)
                res[i][j] = 0;
        }
        for (int i = 0; i < p; i++)
        {
            for (int j = 0; j < n; j++)
            {
                for (int k = 0; k < q; k++){
                    int val=ar1[i][k] * ar2[k][j];
                    res[i][j] += val;
                }
            }
        }
        printf("Result of matrix multiplication is:- \n");
        for (int i = 0; i < p; i++)
        {
            for (int j = 0; j < n; j++)
                printf("%d ", res[i][j]);
            printf("\n");
        }
    }
    return 0;
}
```

OUTPUT:

```
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5> cd "c:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5\" ; if ($?) { gcc q10.c -o q10 } ; if ($?)
 { .\q10 }
Enter row p and column q for array 1, and row m and column n for array 2 :
2 3 3 2
Enter matrix 1:
Enter value for disp[0][0]:1
Enter value for disp[0][1]:2
Enter value for disp[0][2]:3
Enter value for disp[1][0]:4
Enter value for disp[1][1]:5
Enter value for disp[1][2]:6
Enter matrix 2:
Enter value for disp[0][0]:7
Enter value for disp[0][1]:8
Enter value for disp[1][0]:9
Enter value for disp[1][1]:10
Enter value for disp[2][0]:11
Enter value for disp[2][1]:12
Result of matrix multiplication is:-
58 64
139 154
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5> cd "c:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5\" ; if ($?) { gcc q10.c -o q10 } ; if ($?)
 { .\q10 }
Enter row p and column q for array 1, and row m and column n for array 2 :
1 3 2 3
Matrix multiplication not possible.
PS C:\Users\91933\Documents\CSO\Assignments\Lab assignments\S5>
```