DATA STRUCTURE – 1

LAB-1

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Traverse

Program:

```c
//S.Praveen Kumar
//AIE ch.en.u4aie22048
//Data structure lab-1

// Traverse

#include <stdio.h>
int main()
{
    int i,n;
    printf("enter size of the array: ");
    scanf("%d",&n);
    int array[n];
    printf("enter the elements of array:\n");
    for(i=0;i<n;i++)
    {
        printf("a[%d]: ",i);
        scanf("%d",&array[i]);
    }
    printf("The array is----------:");
    for(i=0;i<n;i++)
    {
        printf("%d\n",array[i]);
    }

    return 0;
}
```

Output:

```
enter size of the array: 4
enter the elements of array:a[0]: 1
a[1]: 2
a[2]: 3
a[3]: 4
The array is----------:1
2
3
4


...Program finished with exit code 0
Press ENTER to exit console.
```

Insertion:

Program:

```c
1   //S.Praveen Kumar
2   //AIE ch.en.u4aie22048
3   //Data Structure Lab-1
4
5   //Insertion
6   #include<stdio.h>
7   int main()
8   {
9       int case1,array[100], n,i, item,pos, size, val,values;
10      printf("1.Inseration at Beginning\n2.Insertion at specific Position\n3.Insertion at end\n");
11      printf("ENter a Number: ");
12      scanf("%d",&case1);
13      switch(case1)
14      {
15      case 1:
16      {
17      printf("Enter the size of array: ");
18      scanf("%d", &n);
19      printf("\nEnter Elements in array: \n");
20      for(i=0;i<n;i++)
21      {
22          printf("a[%d]: ",i);
23          scanf("%d", &array[i]);
24      }
25      printf("enter the element at the beginning\n");
26      scanf("%d", &item);
27      n++;
28      for(i=n; i>1; i--)
29      {
30          array[i-1]=array[i-2];
31      }
32      array[0]=item;
33      printf("After resultant array element------------\n");
34      for(i=0;i<n;i++)
35      {
36          printf("\n%d", array[i]);
37      }
38      break;
39      }
40      case 2:
41      {
42          printf("Enter size of the array: ");
43      scanf("%d", &size);
44      printf("Enter elements: \n");
45      for (int i = 0; i < size; i++)
46      {
47          printf("a[%d]: ",i);
48          scanf("%d", &array[i]);
49      }
50      printf("Enter the insertion location\n");
51      scanf("%d", &pos);
52      printf("Enter the value to insert\n");
53      scanf("%d", &val);
54      for (int i = size - 1; i >= pos - 1; i--)
55      {
56          array[i+1] = array[i];
57      }
58      array[pos-1] = val;
59      printf("After inserting Resultant array is--------\n");
60      for (int i = 0; i <= size; i++)
61      {
62          printf("%d\n", array[i]);
63      }
64      break;
65      }
66      case 3:
67      {
68          printf("Enter size of Array Elements: ");
69      scanf("%d",&n);
70      int array[n];
71      printf("Enter the element of array:\n");
72      for(i=0; i<n; i++)
73      {
74          printf("a[%d]: ",i);
75          scanf("%d", &array[i]);
76      }
77      n++;
78      printf("\nEnter Element to Insert: ");
79      scanf("%d", &values);
80      array[i] = values;
81      printf("\nThe After adding the last element--------:\n");
82      for(i=0; i<n; i++)
83      {
84          printf("%d\n", array[i]);
85      }
86          break;
87      }
88
89      default:
90      {
91          break;
92      }
93      }
94  return 0;
95
96  }
```

Output:

```
                                       input
1.Inseration at Beginning
2.Insertion at specific Position
3.Insertion at end
ENter a Number: 1
Enter the size of array: 4

Enter Elements in array:
a[0]: 1
a[1]: 2
a[2]: 3
a[3]: 4
enter the element at the beginning
0
After resultant array element------------

0
1
2
3
4

...Program finished with exit code 0
Press ENTER to exit console.
```

```
1.Inseration at Beginning
2.Insertion at specific Position
3.Insertion at end
ENter a Number: 2
Enter size of the array: 4
Enter elements:
a[0]: 1
a[1]: 2
a[2]: 4
a[3]: 5
Enter the insertion location
3
Enter the value to insert
3
After inserting Resultant array is--------
1
2
3
4
5


...Program finished with exit code 0
Press ENTER to exit console.
```

```
                                       input
1.Inseration at Beginning
2.Insertion at specific Position
3.Insertion at end
ENter a Number: 3
Enter size of Array Elements: 4
Enter the element of array:
a[0]: 1
a[1]: 2
a[2]: 3
a[3]: 4

Enter Element to Insert: 5

The After adding the last element--------:
1
2
3
4
5


...Program finished with exit code 0
Press ENTER to exit console.
```

Deletion:

Program:

```c
1   //S.Praveen Kumar
2   //AIE ch.en.u4aie22048
3   //Data structure lab-1
4
5   // Deletion
6
7   #include<stdio.h>
8
9   int main()
10  {
11      int case1;
12      printf("1.Deletion at beginning\n2.Deletion at specific point\n3.Deletion at end\n");
13      printf("Enter a number: ");
14      scanf("%d",&case1);
15      switch(case1)
16      {
17          case 1:
18          int n,array[10];
19          printf("enter the size of an array:");
20          scanf("%d" ,&n);
21          printf("enter elements in an array: \n");
22          for(int i=0;i<n;i++)
23          {
24              printf("a[%d]:",i);
25              scanf("%d", &array[i]);
26          }
27          n--;
28          for(int i=0;i<n;i++)
29          {
30              array[i]=array[i+1];
31          }
32          printf("\nafter deletion-------- \n");
33          for(int i=0;i<n;i++)
34          {
35              printf("%d\n" , array[i]);
36          }
37          break;

38          case 2:
39          {
40              int arr[10];
41              int pos,i,num;
42          printf ("Enter the number of elements in an array: \n ");
43          scanf ("%d", &num);
44          printf ("Enter %d elements in array: \n ", num);
45          for (i = 0; i < num; i++ )
46          {
47              printf("arr[%d]: ", i);
48              scanf ("%d", &arr[i]);
49          }
50          printf( "the position of the array element to delete: \n");
51          scanf (" %d", &pos);
52          if (pos >= num+1)
53          {
54              printf (" Deletion is not possible in the array.\n");
55          }
56          else
57          {
58              for (i = pos - 1; i < num -1; i++)
59              {
60                  arr[i] = arr[i+1];
61              }
62              printf ("The resultant array is--------: \n");
63              for (i = 0; i< num - 1; i++)
64              {
65                  printf (" %d \n", arr[i]);
66              }
67          }
68          break;
69          }
70          case 3:
71          printf("enter the size of an array\n");
72          scanf("%d" ,&n);
73          printf("enter elements in an array\n");
74          for(int i=0;i<n;i++)
75          {
76              printf("a[%d]: ",i);
77              scanf("%d", &array[i]);
78          }
79          printf("\nafter deletion array elements are----------");
80          for(int i=0;i<n-1;i++)
81          {
82              printf("\n%d" , array[i]);
83          }
84          break;
85          default:
86          {
87              break;
88          }
89      }
90      return 0;
91  }
```

Output:

```
                                                                        input
1.Deletion at beginning
2.Deletion at specific point
3.Deletion at end
Enter a number: 1
enter the size of an array:4
enter elements in an array:
a[0]:0
a[1]:1
a[2]:2
a[3]:3

after deletion--------
1
2
3

...Program finished with exit code 0
Press ENTER to exit console.
```

```
                                                                        input
1.Deletion at beginning
2.Deletion at specific point
3.Deletion at end
Enter a number: 2
Enter the number of elements in an array:
 4
Enter 4 elements in array:
 arr[0]: 1
arr[1]: 2
arr[2]: 5
arr[3]: 3
the position of the array element to delete:
3
The resultant array is--------:
 1
 2
 3

...Program finished with exit code 0
Press ENTER to exit console.
```

```
                                                                        input
1.Deletion at beginning
2.Deletion at specific point
3.Deletion at end
Enter a number: 3
enter the size of an array
4
enter elements in an array
a[0]: 1
a[1]: 2
a[2]: 3
a[3]: 4

after deletion array elements are----------
1
2
3

...Program finished with exit code 0
Press ENTER to exit console.
```
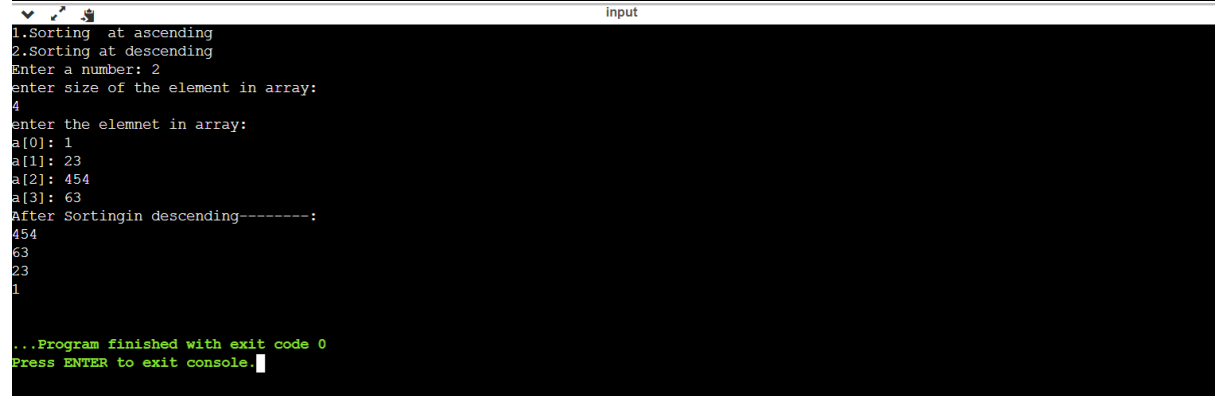
Sorting

Program:

```c
//S.Praveen Kumar
//AIE ch.en.u4aie22048
//Data structure Lab-1

// Deletion

#include<stdio.h>

int main()
{
    int case1;
    printf("1.Sorting  at ascending\n2.Sorting at descending\n");
    printf("Enter a number: ");
    scanf("%d",&case1);
    switch(case1)
    {
        case 1:
        {
        int i,n,j,a;
        printf("enter size of the element in array: \n");
        scanf("%d",&n);
        int array[n];
        printf("enter the elemnet in array: \n");
        for(i=0;i<n;i++)
        {
            printf("a[%d]: ",i);
            scanf("%d",&array[i]);
        }
        for(i=0;i<n;i++)
        {
            for(j=0;j<n;j++)
            {
                if(array[i]<array[j])
                {
                    a=array[i];
                    array[i]=array[j];
                    array[j]=a;
                }
            }
        }
        printf("After Sortingin ascending--------:\n");
        for(i=0;i<n;i++)
        {
            printf("%d\n",array[i]);
        }
        break;
        }
        case 2:
        {
            int i,n,j,a;
            printf("enter size of the element in array: \n");
            scanf("%d",&n);
            int array[n];
        printf("enter the elemnet in array: \n");
        for(i=0;i<n;i++)
        {
            printf("a[%d]: ",i);
            scanf("%d",&array[i]);
        }
        for(i=0;i<n;i++)
        {
            for(j=0;j<n;j++)
            {
                if(array[i]>array[j])
                {
                    a=array[i];
                    array[i]=array[j];
                    array[j]=a;
                }
            }
        }
        printf("After Sortingin descending--------:\n");
        for(i=0;i<n;i++)
        {
            printf("%d\n",array[i]);
        }
        break;
        }
        default:
        {
            break;
        }
    }
    return 0;
}
```

Output:

```
1.Sorting  at ascending
2.Sorting at descending
Enter a number: 1
enter size of the element in array:
4
enter the elemnet in array:
a[0]: 1
a[1]: 23
a[2]: 45
a[3]: 678
After Sortingin ascending--------:
1
23
45
678


...Program finished with exit code 0
Press ENTER to exit console.
```

```
                                        input
1.Sorting  at ascending
2.Sorting at descending
Enter a number: 2
enter size of the element in array:
4
enter the elemnet in array:
a[0]: 1
a[1]: 23
a[2]: 454
a[3]: 63
After Sortingin descending--------:
454
63
23
1


...Program finished with exit code 0
Press ENTER to exit console.
```

Searching

Program:

```
1    //S.Praveen Kumar
2    //AIE ch.en.u4aie22048
3    //Data Structures lab-1
4
5    //searching
6
7    #include <stdio.h>
8    int main()
9  {
10       int i,n,element,count=0;
11       printf("Enter size of the  array : ");
12       scanf("%d", &n);
13       int a[n];
14       printf("Enter elements in array : \n");
15       for(i=0; i<n; i++)
16       {
17           printf("a[%d]: ",i);
18           scanf("%d",&a[i]);
19       }
20       printf("Enter the element to search: ");
21       scanf("%d", &element);
22
23       for(i=0; i<n; i++)
24       {
25           if(a[i]==element)
26           {
27               printf("element found ");
28               count=count+1;
29           }
30
31       }
32       if(count==0)
33       {
34           printf("Elemnet not found");
35       }
36           return 0;
37  }
```

Output:

```
input
Enter size of the  array : 4
Enter elements in array :
a[0]: 1
a[1]: 2
a[2]: 3
a[3]: 4
Enter the element to search: 3
element found

...Program finished with exit code 0
Press ENTER to exit console.
```