

Aim:

Write a program to **sort** (**Ascending order**) the given elements using **insertion sort technique**.

At the time of execution, the program should print the message on the console as:

Enter value of n :

For example, if the user gives the **input** as:

Enter value of n : 3

Next, the program should print the messages one by one on the console as:

Enter element for a[0] :
Enter element for a[1] :
Enter element for a[2] :

if the user gives the **input** as:

Enter element for a[0] : 22
Enter element for a[1] : 33
Enter element for a[2] : 12

then the program should **print** the result as:

Before sorting the elements in the array are
Value of a[0] = 22
Value of a[1] = 33
Value of a[2] = 12
After sorting the elements in the array are
Value of a[0] = 12
Value of a[1] = 22
Value of a[2] = 33

Note: Do use the **printf()** function with a **newline** character (**\n**).

Source Code:

Program505.c

```
#include<stdio.h>
void main()
{
    int a[20],i,j,k,n;
    printf("Enter value of n : ");
    scanf("%d",&n);
    for(i=0 ; i<n ; i++)
    {
        printf("Enter element for a[%d] : ",i);
        scanf("%d", &a[i]);
    }
    printf("Before sorting the elements in the array are\n");
    for(i=0;i<n;i++)
    {
        printf("Value of a[%d] = %d\n",i,a[i]);
    }
}
```

```

    }
    for(i=0;i<n;i++)
    {
        k=a[i];
        j=i-1;
        while(j>=0&& a[j]>k)
        {
            a[j+1]=a[j];
            j--;
        }
        a[j+1]=k;
    }
    printf("After sorting the elements in the array are\n");
    for(i=0;i<n;i++)
    {
        printf("Value of a[%d] = %d\n",i,a[i]);
    }
}

```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Enter value of n : 5
Enter element for a[0] : 7
Enter element for a[1] : 33
Enter element for a[2] : 12
Enter element for a[3] : 56
Enter element for a[4] : 9
Before sorting the elements in the array are
Value of a[0] = 7
Value of a[1] = 33
Value of a[2] = 12
Value of a[3] = 56
Value of a[4] = 9
After sorting the elements in the array are
Value of a[0] = 7
Value of a[1] = 9
Value of a[2] = 12
Value of a[3] = 33
Value of a[4] = 56