S.No: 5	Exp. Name: ***Write a C program to Sort the elements using Insertion Sort Technique***	Date:2023-04-26

Aim:

Write a program to **sort** 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
```

Fill in the missing code so that it produces the desired result.

Source Code:

InsertionSortDemo3.c

```
#include<stdio.h>
void sort(int [],int);
void main()
{
   int a[20],n,i;
   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]);
    }
    sort(a,n);
    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]);
    }
}
void sort (int a[],int n)
{
    int i,j,k;
    for(i=0;i<n;i++)
    {
       k=a[i];
       j=i-1;
       while(j>=0&&a[j]>k)
       {
          a[j+1]=a[j];
          j=j-1;
       }
       a[j+1]=k;
    }
}
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Enter value of n : 6
Enter element for a[0] : 5
Enter element for a[1] : 9
Enter element for a[2] : 2
Enter element for a[3] : 5
Enter element for a[4] : 1
Enter element for a[5] : 3
Before sorting the elements in the array are
Value of a[0] = 5
Value of a[1] = 9
Value of a[2] = 2
Value of a[3] = 5
Value of a[4] = 1
Value of a[5] = 3
After sorting the elements in the array are
Value of a[0] = 1
Value of a[1] = 2
Value of a[2] = 3
Value of a[3] = 5
Value of a[4] = 5
Value of a[5] = 9

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