S.No: 10	Exp. Name: ***Write a C program to Sort given elements using Insertion sort***	Date:2023-04-08

ID: 22K61A05B1

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