S.No: 3	Exp. Name: ***Write a C program to Search a Key element using Binary search Technique***	Date:2023-04-26

Aim:

Write a program to **search** a key element in the given array of elements using `binary search`.

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] : 89
Enter element for a[1] : 33
Enter element for a[2] : 56
```

Next, the program should print the message on the console as:

```
Enter key element :
```

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

```
Enter key element : 56
```

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

```
After sorting the elements in the array are
Value of a[0] = 33
Value of a[1] = 56
Value of a[2] = 89
The key element 56 is found at the position 1
```

Similarly if the key element is given as **25** for the above one dimensional array elements then the program should print the output as "**The Key element 25 is not found in the array**".

Source Code:

BinarySearch.c

```
#include<stdio.h>
void main()
{
   int a[5],i,j,n,temp,k,flag=0;
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]);
    }
    for(i=0;i<n-1;i++)
    {
       for(j=i+1;j<n;j++)
       {
          if(a[j]<a[i])
          {
             temp=a[i];
             a[i]=a[j];
             a[j]=temp;
          }
       }
    }
    printf("Enter key element : ");
    scanf("%d",&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]);
    }
    for(i=0;i<n;i++)
    {
       if(k==a[i])
       {
          flag++;
          break;
       }
    }
    if(flag==1)
    printf("The key element %d is found at the position %d\n",k,i);
    else
    printf("The Key element %d is not found in the array\n",k);
}
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Enter value of n : 3
Enter element for a[0] : 25
Enter element for a[1] : 15
Enter element for a[2] : 23
Enter key element : 45
After sorting the elements in the array are
Value of a[0] = 15
Value of a[1] = 23
Value of a[2] = 25
The Key element 45 is not found in the array

Test Case - 2

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User Output
Enter value of n : 2
Enter element for a[0] : 80
Enter element for a[1] : 39
Enter key element : 50
After sorting the elements in the array are
Value of a[0] = 39
Value of a[1] = 80
The Key element 50 is not found in the array