29. write a c program for hashing with linear probing?

PROGRAM:

```
#include<stdio.h>
#include<limits.h>
void insert(int ary[],int hFn, int size)
{
   int element,pos,n=0;
printf("Enter key element to insert\n");
scanf("%d",&element);
pos = element%hFn;
while(ary[pos]!= INT_MIN) {
if(ary[pos]== INT_MAX)
          break;
pos = (pos+1)%hFn;
n++;
if(n==size)
break;
}

if(n==size)
      printf("Hash table was full of elements\nNo Place to insert this element\n\n");
else
      ary[pos] = element;    //Inserting element
}
void search(int ary[],int hFn,int size){
int element,pos,n=0;

printf("Enter element you want to search\n");
scanf("%d",&element);
```

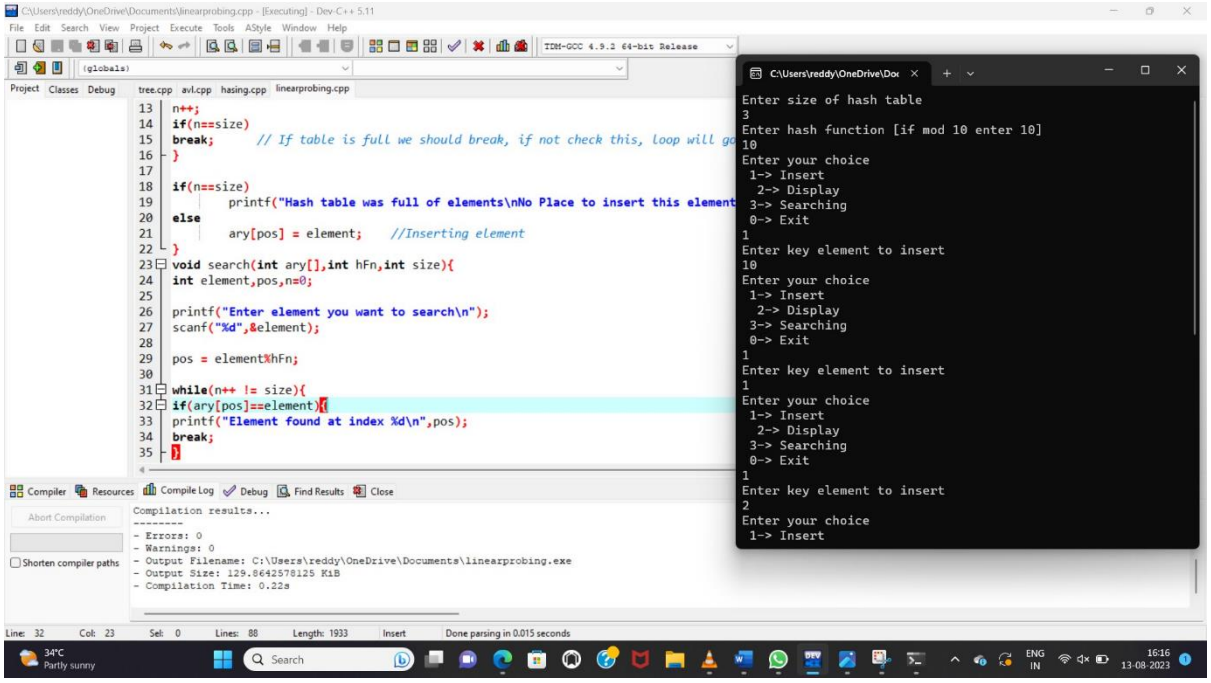
```
pos = element%hFn;

while(n++ != size){
if(ary[pos]==element){
printf("Element found at index %d\n",pos);
break;
}
else
        if(ary[pos]==INT_MAX ||ary[pos]!=INT_MIN)
            pos = (pos+1) %hFn;
}
if(--n==size) printf("Element not found in hash table\n");
}

void display(int ary[],int size){
int i;

printf("Index\tValue\n");

for(i=0;i<size;i++)
      printf("%d\t%d\n",i,ary[i]);
}
int main(){
int size,hFn,i,choice;

printf("Enter size of hash table\n");
scanf("%d",&size);
```

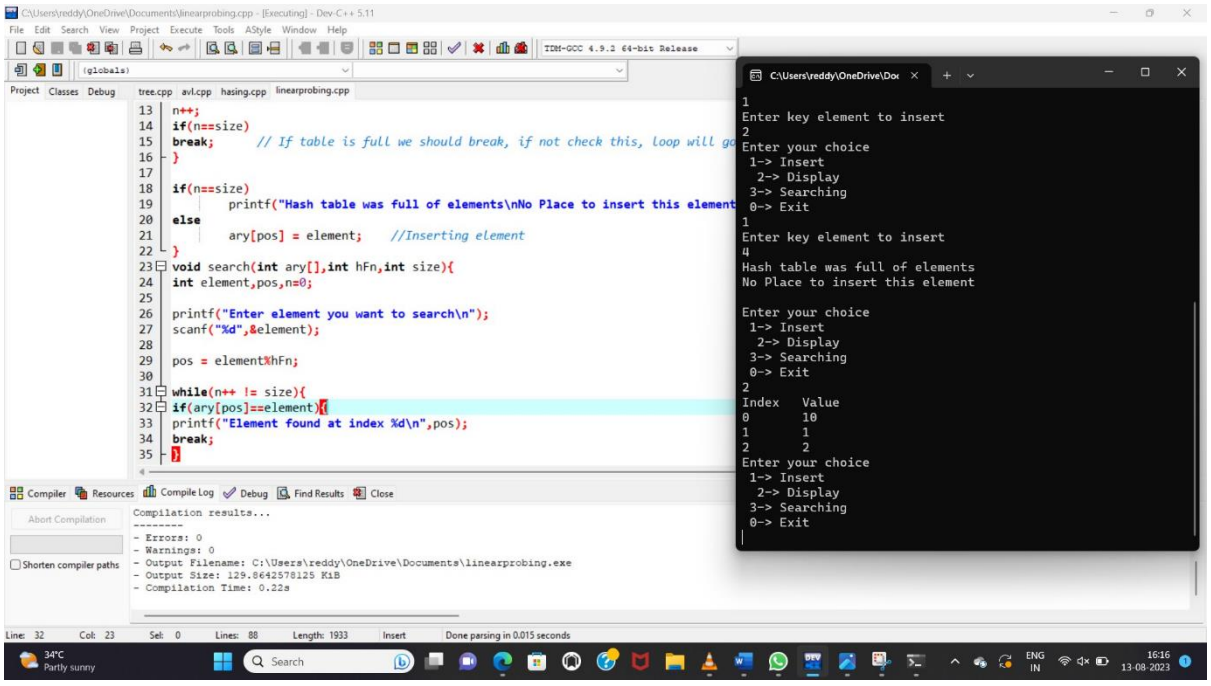
```
int ary[size];

printf("Enter hash function [if mod 10 enter 10]\n");
scanf("%d",&hFn);

for(i=0;i<size;i++)
	ary[i]=INT_MIN; //Assigning INT_MIN indicates that cell is empty

do{
printf("Enter your choice\n");
printf(" 1-> Insert\n  2-> Display\n 3-> Searching\n 0-> Exit\n");
scanf("%d",&choice);

switch(choice){
case 1:
insert(ary,hFn,size);
break;
case 2:
display(ary,size);
break;
case 3:
search(ary,hFn,size);
break;
default:
printf("Enter correct choice\n");
break;
}
}while(choice);
```

return 0;

}

OUTPUT:



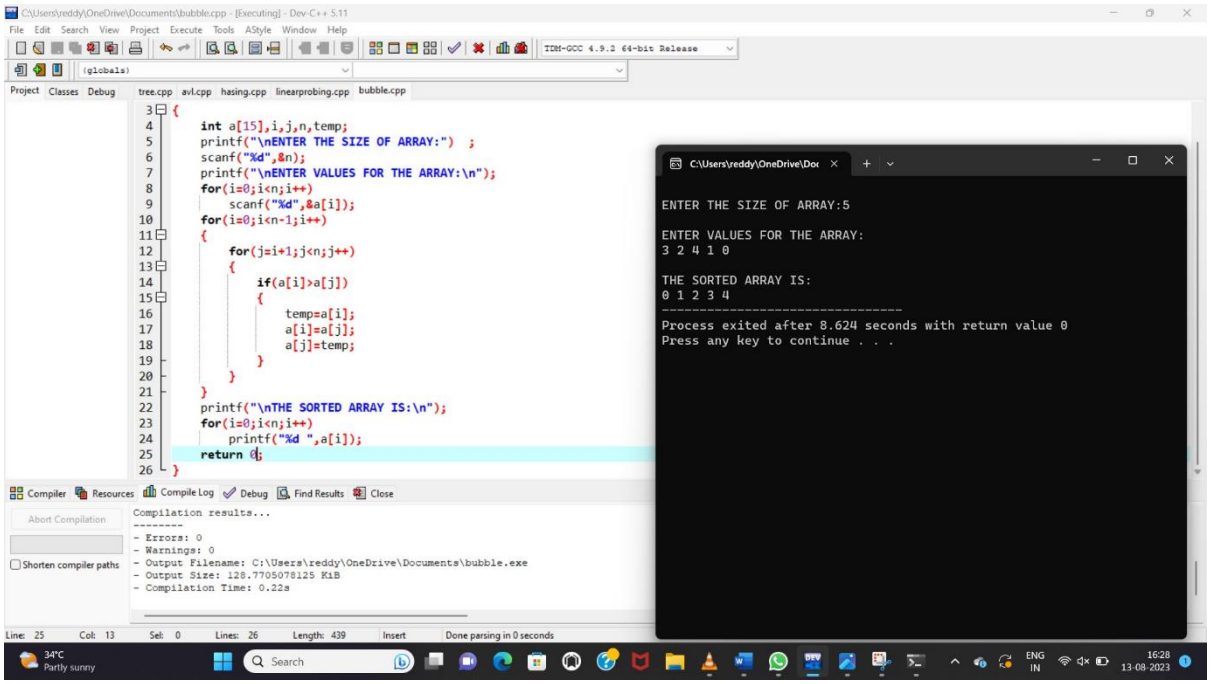


30.write a c program for bubble sorting?

PROGRAM:

```
#include <stdio.h>
int main()
{
        int a[15],i,j,n,temp;
        printf("\nENTER THE SIZE OF ARRAY:")  ;
        scanf("%d",&n);
        printf("\nENTER VALUES FOR THE ARRAY:\n");
        for(i=0;i<n;i++)
          scanf("%d",&a[i]);
        for(i=0;i<n-1;i++)
        {
          for(j=i+1;j<n;j++)
          {
                if(a[i]>a[j])
                {
                        temp=a[i];
                        a[i]=a[j];
                        a[j]=temp;
                }
          }
        }
        printf("\nTHE SORTED ARRAY IS:\n");
        for(i=0;i<n;i++)
          printf("%d ",a[i]);
        return 0;
}
```

OUTPUT:


C:\Users\reddy\OneDrive\Documents\bubble.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
tree.cpp avl.cpp hasing.cpp linearprobing.cpp bubble.cpp
{
int a[15],i,j,n,temp;
printf("\nENTER THE SIZE OF ARRAY:") ;
scanf("%d",&n);
printf("\nENTER VALUES FOR THE ARRAY:\n");
for(i=0;i<n;i++)
scanf("%d",&a[i]);
for(i=0;i<n-1;i++)
{
for(j=i+1;j<n;j++)
{
if(a[i]>a[j])
{
temp=a[i];
a[i]=a[j];
a[j]=temp;
}
}
}
printf("\nTHE SORTED ARRAY IS:\n");
for(i=0;i<n;i++)
printf("%d ",a[i]);
return 0;
}
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Shorten compiler paths
Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\reddy\OneDrive\Documents\bubble.exe
- Output Size: 128.7705078125 KiB
- Compilation Time: 0.22s
Line: 25 Col: 13 Sel: 0 Lines: 26 Length: 439 Insert Done parsing in 0 seconds
C:\Users\reddy\OneDrive\Doc
ENTER THE SIZE OF ARRAY:5
ENTER VALUES FOR THE ARRAY:
3 2 4 1 0
THE SORTED ARRAY IS:
0 1 2 3 4

Process exited after 8.624 seconds with return value 0
Press any key to continue . . .
34°C
Partly sunny
Search
ENG
IN
16:28
13-08-2023

31.write the c program for selection sorting:

```
#include <stdio.h>
int main()
{
        int array[10];
        int i, j, N, temp;

        int findmax(int b[10], int k);
        void exchang(int b[10], int k);



        printf("Enter the value of N\n");
        scanf("%d",&N);

        printf("Enter the elements one by one\n");
        for(i=0; i<N ; i++)
        {
                scanf("%d",&array[i]);

        }

        printf("Input array elements\n");
        for(i=0; i<N ; i++)
        {
                printf("%d\n",array[i]);
        }

        exchang(array,N);

        printf("Sorted array is...\n");
```

```
        for(i=0; i< N ; i++)
        {
                printf("%d\n",array[i]);
        }
        return 0;
 }

int findmax(int b[10], int k)
{
        int max=0,j;
        for(j = 1; j <= k; j++)
        {
                if ( b[j] > b[max])
                {
                        max = j;
                }
        }
        return(max);
}

void exchang(int b[10],int k)
{
        int  temp, big, j;
        for ( j=k-1; j>=1; j--)
        {
                big = findmax(b,j);
                temp = b[big];
                b[big] = b[j];
                b[j] = temp;
        }
        return;
```

}

Output:

```
C:\Users\vamsi\OneDrive\Doc
Enter the value of N
5
Enter the elements one by one
4
6
1
3
9
Input array elements
4
6
1
3
9
Sorted array is...
1
3
4
6
9

--------------------------------
Process exited after 16.03 seconds with return value 0
Press any key to continue . . .
```

32.write a c program for insertion sorting:

```
#include<stdio.h>
int main()
{
	int A[20],n,Temp,i,j;
	printf("\n\t\t\t-----INSERTION SORT-----\n\n");
	printf("\n\n ENTER THE NUMBER OF TERMS...: ");
	scanf("%d",&n);
	printf("\n ENTER THE ELEMENTS OF THE ARRAY...:\n");
	for(i=0; i < n;i++)
	{
		scanf("%d", &A[i]);
	}
	for(i=1; i< n; i++)
	{
		Temp = A[i];
		j = i-1;
		while(Temp < A[j] && j>=0)
		{
			A[j+1] = A[j];
			j = j-1;
		}
		A[j+1] = Temp;
	}
	printf("\n\t\t\t-------INSERTION SORTED ELEMENTS------\n\n");
	printf("\nTHE ASCENDING ORDER LIST IS...:");
	for(i=0; i < n; i++)
	{
		printf("\t%d", A[i]);
	}
	return 0;
```

}

Output:

```c
{
    int A[20],n,Temp,i,j;
    printf("\n\t\t\t-----INSERTION SORT-----\n\n");
    printf("\n\n ENTER THE NUMBER OF TERMS...: ");
    scanf("%d",&n);
    printf("\n ENTER THE ELEMENTS OF THE ARRAY...:\n");
    for(i=0; i < n;i++)
    {
        scanf("%d", &A[i]);
    }
    for(i=1; i< n; i++)
    {
        Temp = A[i];
        j = i-1;
        while(Temp < A[j] && j>=0)
        {
            A[j+1] = A[j];
            j = j-1;
        }
        A[j+1] = Temp;
    }
    printf("\n\t\t\t-------INSERTION SORTED ELEMENTS------\n\n");
    printf("\nTHE ASCENDING ORDER LIST IS...:");
    for(i=0; i < n; i++)
    {
        printf("\t%d", A[i]);
    }
    return 0;
}
```

```
                    -----INSERTION SORT-----


 ENTER THE NUMBER OF TERMS...: 5

 ENTER THE ELEMENTS OF THE ARRAY...:
4
6
0
2
8

                    -------INSERTION SORTED ELEMENTS------


THE ASCENDING ORDER LIST IS...: 0       2       4       6       8

--------------------------------
Process exited after 22.52 seconds with return value 0
Press any key to continue . . .
```

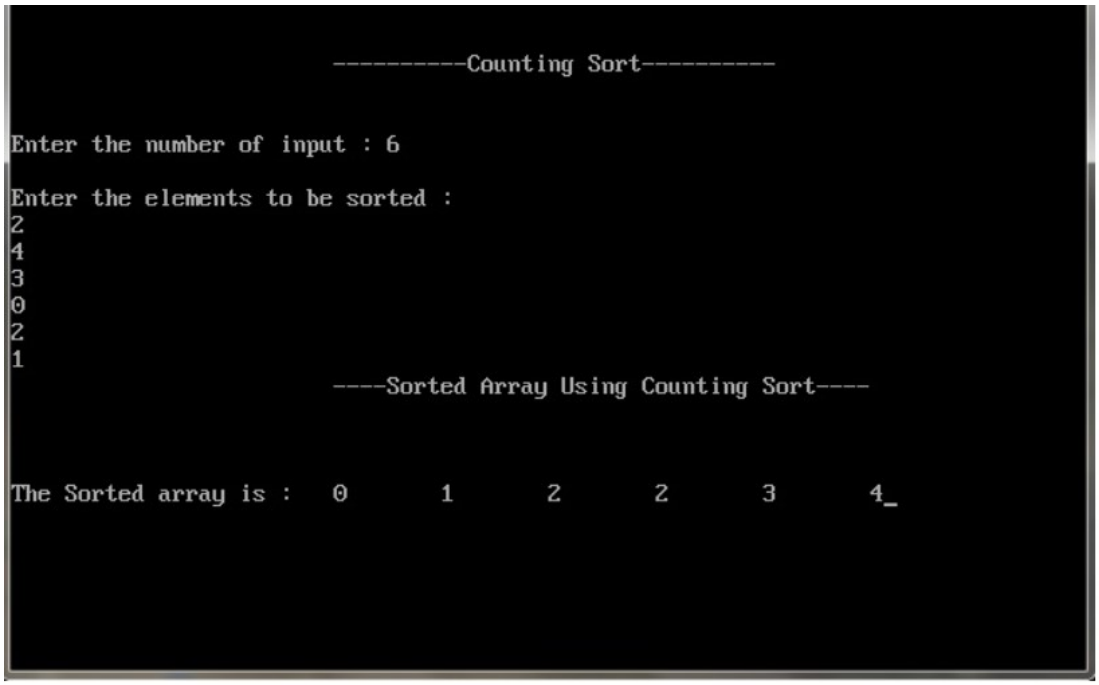
33.write a c program for merge sorting:

```c
#include<stdio.h>
#include<conio.h>
int arr[20];
void main()
{
        int n,i;
        clrscr();
        printf("\n\t\t\t------Merge Sorting------\n\n");
        printf("Enter the size of array\n");
        scanf("%d",&n);
        printf("Enter the elements:\n");
        for(i=0; i < n; i++)
        {
                scanf("%d",&arr[i]);
        }
        merge_sort(arr,0,n-1);
        printf("\n\n\t\t\t-----Merge Sorted Elements-----\n\n");
        printf("Sorted array:\t");
```

```
	for(i=0; i < n; i++)
	{
		printf("\t%d",arr[i]);
	}
	getch();
}

int merge_sort(int arr[],int low,int high)
{
	int mid;
	if(low < high)
	{
		mid=(low+high)/2;
		merge_sort(arr,low,mid);
		merge_sort(arr,mid+1,high);
		merge(arr,low,mid,high);
	}
}
int merge(int arr[],int l,int m,int h)
{
	int arr1[10],arr2[10];
	int n1,n2,i,j,k;
	n1=m-l+1;
	n2=h-m;
	for(i=0; i <  n1; i++)
	{
		arr1[i]=arr[l+i];
	}
	for(j=0; j < n2; j++)
	{
		arr2[j]=arr[m+j+1];
```

```
        }
        arr1[i]=9999;
        arr2[j]=9999;
        i=0;
        j=0;
        for(k=l; k <=h; k++)
        {
                if(arr1[i]<=arr2[j])
                        arr[k]=arr1[i++];
                else
                        arr[k]=arr2[j++];
        }
}
```

Output:



34.write a c program for quick sorting:

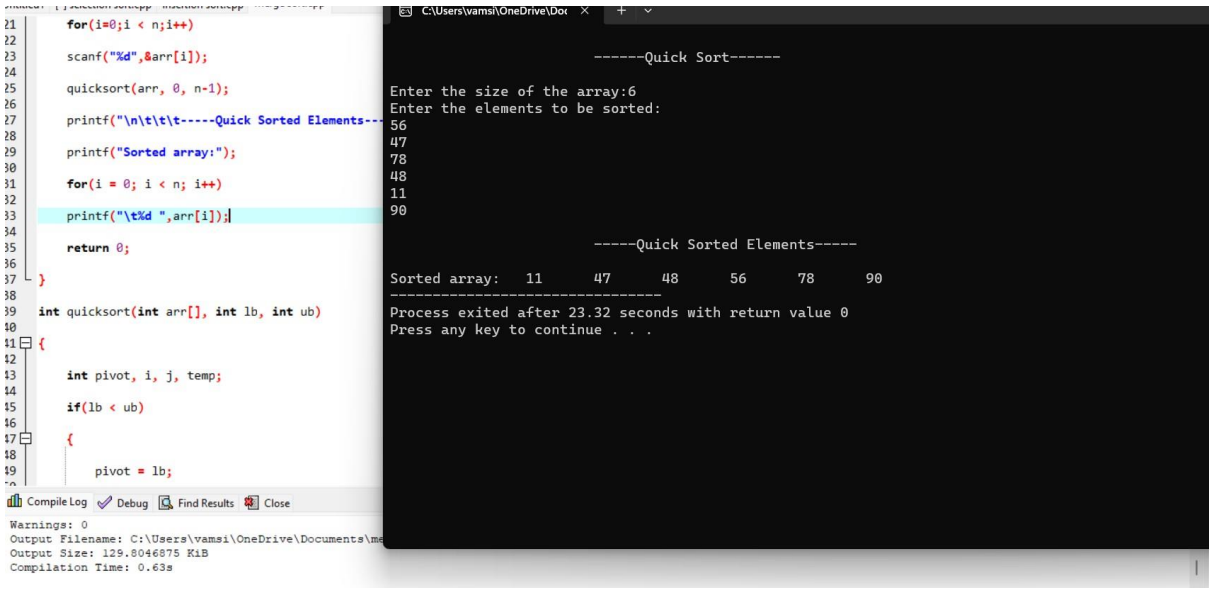
```
#include<stdio.h>


int quicksort(int arr[], int lb, int ub);

int main()

{

        int arr[20], n, i;


        printf("\n\t\t\t------Quick Sort------\n\n");

        printf("Enter the size of the array:");

        scanf("%d",&n);

        printf("Enter the elements to be sorted:\n");

        for(i=0;i < n;i++)

        scanf("%d",&arr[i]);

        quicksort(arr, 0, n-1);

        printf("\n\t\t\t-----Quick Sorted Elements-----\n\n");

        printf("Sorted array:");
```

```
        for(i = 0; i < n; i++)

        printf("\t%d ",arr[i]);

    return 0;

}

int quicksort(int arr[], int lb, int ub)

{

        int pivot, i, j, temp;

        if(lb < ub)

        {

                pivot = lb;

                i = lb;

                j = ub;

                while(i < j)

                {

                        while(arr[i] <= arr[pivot] &&  i <= ub)

                        i++;
```

```
            while(arr[j] > arr[pivot] && j >= lb)

            j--;

            if(i < j)

            {

                temp = arr[i];

                arr[i] = arr[j];

                arr[j] = temp;

            }

        }

        temp = arr[j];

        arr[j] = arr[pivot];

        arr[pivot] = temp;

        quicksort(arr, lb, j-1);

        quicksort(arr, j+1, ub);

}
```

}

Out put:


for(i=0;i < n;i++)
scanf("%d",&arr[i]);
quicksort(arr, 0, n-1);
printf("\n\t\t\t-----Quick Sorted Elements---
printf("Sorted array:");
for(i = 0; i < n; i++)
printf("\t%d ",arr[i]);
return 0;
}
int quicksort(int arr[], int lb, int ub)
{
int pivot, i, j, temp;
if(lb < ub)
{
pivot = lb;
Compile Log
Debug
Find Results
Close
Warnings: 0
Output Filename: C:\Users\vamsi\OneDrive\Documents\me
Output Size: 129.8046875 KiB
Compilation Time: 0.63s
C:\Users\vamsi\OneDrive\Doc
------Quick Sort------
Enter the size of the array:6
Enter the elements to be sorted:
56
47
78
48
11
90
-----Quick Sorted Elements-----
Sorted array: 11 47 48 56 78 90
Process exited after 23.32 seconds with return value 0
Press any key to continue . . .