

## QUICK SORT AND MERGE SORT

### Quick Sort:

#### Code:

```
#include<stdio.h>

int partition(int a[],int low,int high)
{
    int i,j,temp,pivot;
    pivot=low;
    i=low+1;
    j=high;
    while(i<=j)
    {
        while(a[i]<a[pivot])
        {
            i++;
        }
        while(a[j]>a[pivot])
        {
            j--;
        }
        if(i<j)
        {
            temp=a[i];
            a[i]=a[j];
            a[j]=temp;
        }
    }
}
```

```
    }  
  
    }  
    temp=a[low];  
    a[low]=a[j];  
    a[j]=temp;  
    return j;  
}
```

```
void qsort(int a[],int low,int high)  
{  
    int mid;  
    if(low<high)  
    {  
        mid=partition(a,low,high);  
        qsort(a,low,mid-1);  
        qsort(a,mid+1,high);  
    }  
}
```

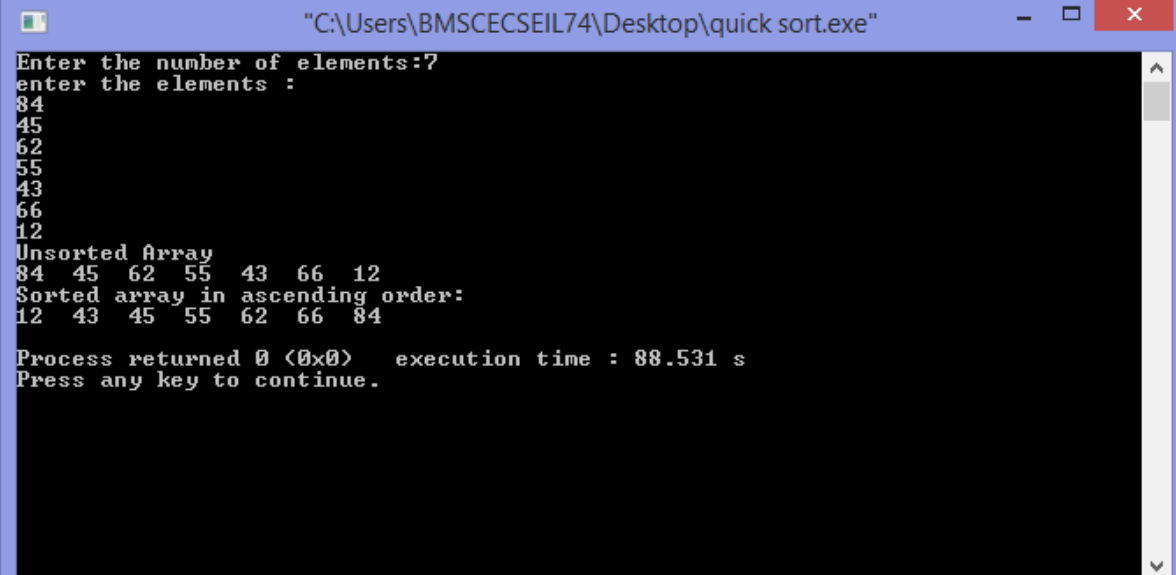
```
void main()  
{  
  
    int a[100],n,i,low,high;  
    printf("\nEnter the number of elements:");  
    scanf("%d",&n);
```

```

printf("\nEnter the elements:");
for(i=0;i<n;i++)
{
    scanf("%d",&a[i]);
}
low=0;
high=n-1;
qsort(a,low,high);
printf("\nSorted Elements are:\t");
for(i=0;i<n;i++)
{
    printf("%d\t",a[i]);
}
getch();
}

```

## Output:



```

"C:\Users\BMSCECSEIL74\Desktop\quick sort.exe"
Enter the number of elements:7
enter the elements :
84
45
62
55
43
66
12
Unsorted Array
84 45 62 55 43 66 12
Sorted array in ascending order:
12 43 45 55 62 66 84
Process returned 0 (0x0)   execution time : 88.531 s
Press any key to continue.

```

## Merge Sort:

## Code:

```
#include<stdio.h>
```

```
void merge(int a[],int low,int mid,int high)
```

```
{
```

```
    int i,j,k,c[100];
```

```
    i=low;
```

```
    j=mid+1;
```

```
    k=low;
```

```
    while(i<=mid&& j<=high)
```

```
    {
```

```
        if(a[i]<a[j])
```

```
        {
```

```
            c[k++]=a[i++];
```

```
        }
```

```
        else
```

```
        {
```

```
            c[k++]=a[j++];
```

```
        }
```

```
    }
```

```
    while(i<=mid)
```

```
    {
```

```
        c[k++]=a[i++];
```

```
    }
```

```
    while(j<=high)
```

```
    {
```

```
        c[k++]=a[j++];
```

```
    }
```

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

```
{  
    a[i]=c[i];  
}  
} //merge
```

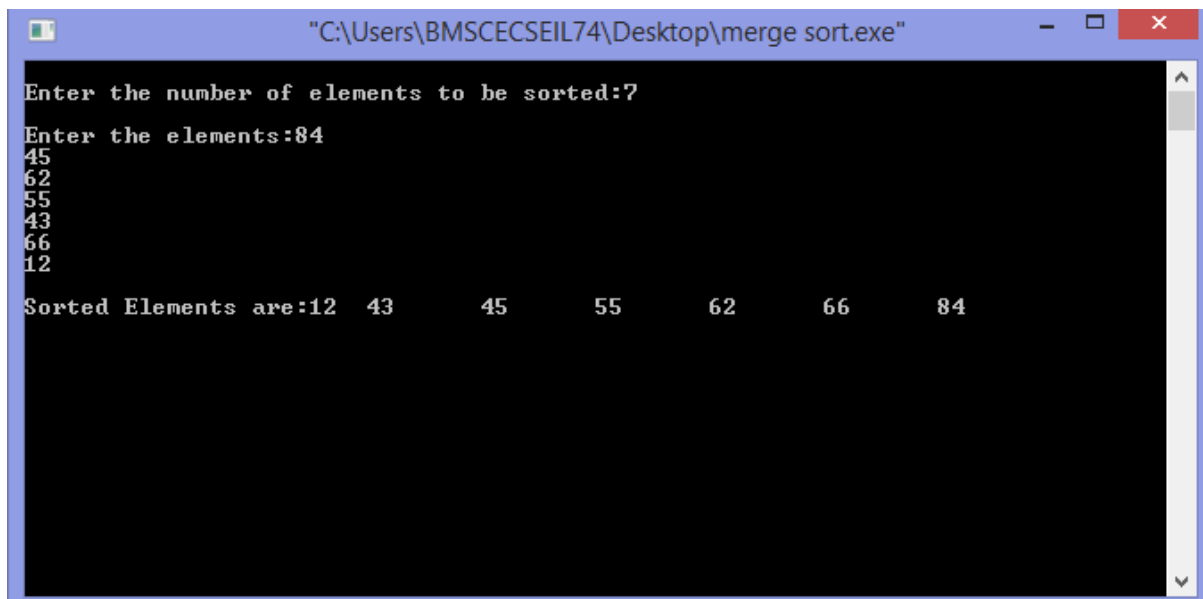
```
void mergesort(int a[],int low,int high)  
{  
    int mid;  
    if(low<high)  
    {  
        mid=(low+high)/2;  
        mergesort(a,low,mid);  
        mergesort(a,mid+1,high);  
        merge(a,low,mid,high);  
    }  
} //mergeSort
```

```
void main()  
{  
    int a[100],n,i,low,high;  
    printf("\nEnter the number of elements to be sorted:");  
    scanf("%d",&n);  
    printf("\nEnter the elements:");  
    for(i=0;i<n;i++)  
    {  
        scanf("%d",&a[i]);  
    }  
    low=0;  
    high=n-1;
```

```
printf("Unsorted elements :\t");  
for(i=0;i<n;i++)  
{  
    printf("%d\t",a[i]);  
}  
mergesort(a,low,high);  
printf("\nSorted Elements are: \t");  
for(i=0;i<n;i++)  
{  
    printf("%d\t",a[i]);  
}
```

```
//main
```

## Output:



```
"C:\Users\BMSCECSEIL74\Desktop\merge sort.exe"  
Enter the number of elements to be sorted:7  
Enter the elements:84  
45  
62  
55  
43  
66  
12  
Sorted Elements are:12  43    45    55    62    66    84
```