Linear Search

```
#include<stdio.h>
#include<conio.h>
void main()
{
	int arr[100],i,item,loc,n,f;
	printf("Enter the range : ");
	scanf("%d",&n);
	printf("Enter the elements of the array :");
	for(i=0;i<n;i++)
	{
		scanf("%d",&arr[i]);
	}
	printf("Enter the element to be searched : ");
	scanf("%d",&item);
	for(i=0;i<n;i++)
	{
		if(arr[i]==item)
```

```
            {
                f=1;
                loc=i;
                break;
            }
        }
        if(f==1)
        {
            printf("Element found at %d",loc);
        }
        else
        {
            printf("Element not found");
        }
        getch();
}
```

Binary Search

```
#include<stdio.h>
#include<conio.h>
void main()
{
	int arr[100],i,item,loc=-1,n,u=0,h=n-1,mp;
	printf("Enter the range : ");
	scanf("%d",&n);
	printf("Enter the elements of the array :");
	for(i=0;i<n;i++)
	{
		scanf("%d",&arr[i]);
	}
	printf("Enter the element to be searched : ");
	scanf("%d",&item);
	while(u<=h)
	{
		mp=(u+h)/2;
		if(arr[mp]==item)
```

```
        {
            loc=mp;
            break;
        }
        else if(arr[mp]>item)
        {
            h=mp-1;
        }
        else
        {
            u=mp+1;
        }
}
if(loc=-1)
{
        printf("Not found");
}
else
```

```
    {
        printf("Element found at location : %d",loc);
    }
    getch();
}
```

Bubble Sort

```
#include<stdio.h>
void main()
{
    int arr[100],i,j,temp,n;
    printf("Enter the number of elements : ");
    scanf("%d",&n);
    printf("Enter the elements of the array : ");
    for(i=0;i<n;i++)
    {
        scanf("%d",&arr[i]);
    }
```

```
    for(i=0;i<n;i++)
    {
        for(j=0;j<(n-1-i);j++)
        {
            if(arr[j]>arr[j+1])
            {
                temp=arr[j];
                arr[j]=arr[j+1];
                arr[j+1]=temp;
            }
        }
    }
    printf("Sorted array : ");
    for(i=0;i<n;i++)
        printf("%d    ",arr[i]);
}
```

Selection Sort

```
#include<stdio.h>
void main()
{
	int a[100],i,j,t,small,n;
	printf("Enter the number of elements : ");
	scanf("%d",&n);
	printf("Enter the elements of the array : ");
	for(i=0;i<n;i++)
		scanf("%d",&a[i]);
	for(i=0;i<n;i++)
	{
		small=i;
		for(j=(i+1);j<n;j++)
			if(a[small]>a[j])
				small=j;
		if(i!=small)
		{
			t=a[i];
```

```
                a[i]=a[small];
                a[small]=t;
            }
        }
        printf("Sorted Array : ");
        for(i=0;i<n;i++)
            printf("%d    ",a[i]);
}
```

Insertion Sort

```
#include<stdio.h>
void main()
{
        int arr[100],i,j,n,t;
        printf("Enter the number of elements : ");
        scanf("%d",&n);
        printf("Enter the elements of the array : ");
        for(i=0;i<n;i++)
```

```
        scanf("%d",&arr[i]);
    for(i=0;i<n;i++)
    {
        j=i;
        while((j>0)&&(arr[j-1]>arr[j]))
        {
            t=arr[j];
            arr[j]=arr[j-1];
            arr[j-1]=t;
            j--;
        }
    }
    printf("Sorted Array : ");
    for(i=0;i<n;i++)
        printf("%d    ",arr[i]);
}
```

Quick Sort

```
#include<stdio.h>
int n,A[100],b,s,piv,temp;
void split(int a[100],int l, int u)
{
	b=l+1;
	s=u;
	piv=a[l];
	while(s>b)
	{
		while(a[b]<piv)
			b++;
		while(a[s]>piv)
			s--;
		if(s>b)
		{
			temp=a[b];
			a[b]=a[s];
			a[s]=temp;
```

```
            }
        }
        temp=a[l];
        a[l]=a[s];
        a[s]=temp;
}
void quicksort(int a[100],int l, int u)
{
        if(l<u)
        {
                split(a,l,u);
                quicksort(a,l,s-1);
                quicksort(a,s+1,u);
        }
}
void main()
{
        int i;
```

```
	printf("Enter the number of elements : ");
	scanf("%d",&n);
	printf("Enter the elements of the array : ");
	for(i=0;i<n;i++)
		scanf("%d",&A[i]);
	quicksort(A,0,n-1);
	printf("Sorted Array : ");
	for(i=0;i<n;i++)
		printf("%d    ",A[i]);
}
```

Merge Sort