1. Write a program for the Insertion sort algorithm.

```
#include<stdio.h>
void main()
{
  int n,array[1000],x,y,z;
   printf("Enter number of elements\n");
   scanf("%d",&n);
   printf("Enter %d integers\n",n);
   for(x=0;x<n;x++)
   scanf("%d",&array[x]);
   for(x=1;x<=n-1;x++)
{
   y=x;
   while(y>0&&array[y-1]>array[y])
{
    z=array[y];
   array[y]=array[y-1];
   array[y-1]=z;
   y--;
}
}
   printf("Sorted array in ascending order:\n");
 for(x=0;x<=n-1;x++)
{
  printf("%d\n",array[x]);
}
}
```

```
OUTPUT:
Enter number of elements
5
Enter 5 integers
89
56
99
145
543
Sorted array in ascending order:
56
89
99
145
```

```
543
```

2. Write a program for the Selection sort algorithm.

```
#include<stdio.h>
void main()
{
   int n,array[100],c,d,temp,position;
   printf("Enter number of elements\n");
   scanf("%d",&n);
   printf("Enter %d integers\n",n);
for(c=0;c<n;c++)
   scanf("%d",&array[c]);
for(c=0;c<=n-1;c++)
{
   position=c;
for(d=c+1;d<n;d++)
{
if(array[position]>array[d])
   position=d;
}
if(position!=c)
{
   temp=array[c];
   array[c]=array[position];
   array[position]=temp;
}
}
   printf("Sorted array in ascending order:\n");
for(c=0;c<n;c++)
   printf("%d\n",array[c]);
}
```

OUTPUT

```
Enter number of elements
5
Enter 5 integers
134
89
65
433
43
Sorted array in ascending order:
43
```

```
65
89
134
433
```

3. Write a program for Bubble sort algorithm.

```
#include<stdio.h>
void main()
{
   int n,array[100],x,y,temp;
   printf("Enter number of elements\n");
   scanf("%d",&n);
    printf("Enter %d integers\n",n);
for(x=0;x<n;x++)
   scanf("%d",&array[x]);
for(x=0;x<=n-1;x++)
{
  for(y=0;y<n-x;y++)
   {
      if(array[y]>array[y+1])
      {
         temp=array[y];
         array[y]=array[y+1];
         array[y+1]=temp;
      }
   }
}
printf("Sorted array in ascending order:\n");
for(x=0;x<n;x++)
printf("%d\n",array[x]);
}
```

OUTPUT

```
Enter number of elements
4
Enter 4 integers
34
70
61
3 99
Sorted array in ascending order:
34
```

```
61
70
99
```

4. Write a program for the Merge sort algorithm.

```
#include<stdio.h>
void mergesort(int a[],int i,int j);
void merge(int a[],int i1,int j1,int i2,int j2);
int main()
{
   int a[30],n,i;
   printf("Enter no of elements:");
   scanf("%d",&n);
   printf("Enter array elements:");

   for(i=0;i<n;i++)
   scanf("%d",&a[i]);

   mergesort(a,0,n-1);
   printf("\nSorted array is:");
   for(i=0;i<n;i++)
   printf("%d",a[i]);

    return 0;
}
void mergesort(int a[],int i,int j)
{
   int mid;
   if(i<j)
  {
    mid=(i+j)/2;
    mergesort(a,i,mid);
    mergesort(a,mid+1,j);
     merge(a,i,mid,mid+1,j);
  }
}
void merge(int a[],int i1,int j1,int i2,int j2)
{
    int temp[50];
    int i,j,k;
    i=i1;
    j=i2;
  k=0;
while(i<=j1&&j<=j2)
{
   if(a[i]<a[j])
   temp[k++]=a[i++];
   else
   temp[k++]=a[j++];
}
while(i<=j1)
  temp[k++]=a[i++];
while(j<=j2)
 temp[k++]=a[j++];
for(i=i1,j=0;i<=j2;i++,j++)
a[i]=temp[j];
}
```

```
OUTPUT
Enter no of elements:3
Enter array elements:56
76
33

Sorted array is:335676
```

5. Write a program for the Heap sort algorithm.

```
#include<stdio.h>

void create(int []);
void down_adjust(int [],int);

void main()
{
  int heap[30],n,i,last,temp;
  printf("Enter no. of elements:");
  scanf("%d",&n);
  printf("\nEnter elements:");
  for(i=1;i<=n;i++)
  scanf("%d",&heap[i]);


  heap[0]=n;
  create(heap);
  while(heap[0] > 1)
{

   last=heap[0];
   temp=heap[1];
   heap[1]=heap[last];
   heap[last]=temp;
   heap[0]--;
    down_adjust(heap,1);
}


   printf("\nArray after sorting:\n");
  for(i=1;i<=n;i++)
  printf("%d ",heap[i]);
}

void create(int heap[])
{
   int i,n;
   n=heap[0];
   for(i=n/2;i>=1;i--)
   down_adjust(heap,i);
}

void down_adjust(int heap[],int i)
{
   int j,temp,n,flag=1;
   n=heap[0];

while(2*i<=n && flag==1)
{
    j=2*i;
  if(j+1<=n && heap[j+1] > heap[j])
  j=j+1;
  if(heap[i] > heap[j])
  flag=0;
 else
 {
   temp=heap[i];
   heap[i]=heap[j];
   heap[j]=temp;
 i=j;
  }
 }
}
```

OUTPUT

```
Enter no. of elements:5

Enter elements:85
23
78
66
99 1

Array after sorting:
23 66 78 85 91
```