

```

#include<iostream>

using namespace std;

class Heap
{
public:
int arr[100];

void getArray(int n);
void printArray(int n);
void maxHeapify(int arr[],int n,int i);
void maxheapsort(int arr[],int n);
void minHeapify(int arr[],int n,int i);
void minheapsort(int arr[],int n);
};

//Insert value
void Heap:: getArray(int n)
{
for(int i=0;i<n;i++)
{
cin>>arr[i];
}
}

//display value
void Heap::printArray(int n)
{
for(int i=0;i<n;i++)
{
cout<<" "<<arr[i];
}
}

//max heapify
void Heap::maxHeapify(int arr[],int n,int i)

```

```

{

int max = i;
int left = 2*i+1;

int right = 2*i+2;

if (left < n && arr[left] > arr[max])
{
    max = left;
}
if (right < n && arr[right] > arr[max])
{
    max = right;
}

if (max != i)
{
    swap(arr[i], arr[max]);
    maxHeapify(arr, n, max);
}
}

//max heap sort
void Heap::maxheapsort(int arr[],int n)
{
    for (int i = n / 2 - 1; i >= 0; i--)
    {
        maxHeapify(arr, n, i);
    }
    for (int i = n - 1; i >= 0; i--)
    {

```

```

    swap(arr[0], arr[i]);
    maxHeapify(arr, i, 0);
}
}

//min heapify
void Heap::minHeapify(int arr[],int n,int i)
{
    int max = i;

    int left = 2*i+1;

    int right = 2*i+2;

    if (left < n && arr[left] < arr[max])
    {
        max = left;
    }
    if (right < n && arr[right] < arr[max])
    {
        max = right;
    }

    if (max != i)
    {
        swap(arr[i], arr[max]);
        maxHeapify(arr, n, max);
    }
}

//min heap sort
void Heap::minheapsort(int arr[],int n)
{

```

```

for (int i = n / 2 - 1; i >= 0; i--)
{
    minHeapify(arr, n, i);
}

for (int i = n - 1; i >= 0; i--)
{
    swap(arr[0], arr[i]);
    minHeapify(arr, i, 0);
}

int main()
{
    Heap h1;
    int n,a=1;
    cout<<"\n Heap Sort Program";
    while(a==1)
    {
        cout<<"\n -----"<<endl;
        cout<<"\n Enter The Number of Elements: ";
        cin>>n;
        cout<<"\n Enter The Array Elements: "<<endl;
        h1.isArray(n);
        cout<<"\n -----"<<endl;
        cout<<"\n Array Before Sorting:- "<<endl; h1.printArray(n);
        cout<<"\n -----"<<endl;
        h1.maxheapsort(h1.arr,n);
        cout<<"\n Array After Sorting(Max Heapify):- "<<endl;
        h1.printArray(n);
        cout<<"\n -----"<<endl;
        h1.minheapsort(h1.arr,n);
        cout<<"\n Array After Sorting(Min Heapify):- "<<endl;
    }
}

```

```
h1.printArray(n);  
cout<<"\n -----"<<endl;  
cout<<"\n Do You Want to Continue?Press 1 Else 0: ";  
cin>>a;  
}  
return 0;  
}
```