#include<iostream>

using namespace std;

class Heap

{

int a[50],b[50],n;

public:

Heap()

{

n=-1;;

}

void insheap(int);

int delheap();

void display();

void heapsort();

};

void Heap::insheap(int item)

{

int i,j;

n++;

i=n;

while(i>0)

{

j=(i-1)/2;

if(item<=a[j])

{

a[i]=item;

return ;

}

a[i]=a[j];

i=j;

}

a[0]=item;

}

int Heap::delheap()

{

int left,right,last,i,item;

item=a[0];

last=a[n];

n--;

i=0;

left=1;

right=2;

while(right<=n)

{

if(last>=a[left] && last >=a[right])

{

a[i]=last;

return item;

}

if(a[right]<=a[left])

{

a[i]=a[left];

i=left;

}

else

{

a[i]=a[right];

i=right;

}

left=(2\*i)+1;

right=left+1;

}

if(left==n)

{

if(last<a[left])

{

a[i]=a[left];

i=left;

}

}

a[i]=last;

return item;

}

void Heap::display()

{

cout<<"\n Elements in heaps are:\n";

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

{

cout<<" "<<a[i];

}

}

void Heap::heapsort()

{

int item,ch,temp,j=0;

do

{

cout<<"\n enter item to insert:";

cin>>item;

insheap(item);

cout<<"\n do you want to insert again ? press 1 for Yes and 0 for NO";

cin>>ch;

}while(ch!=0);

cout<<"\n before sorting\n";

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

{

cout<<" "<<a[i];

}

temp=n;

while(n!=-1)

{

b[j]=delheap();

j++;

}

cout<<"\n after sorting\n";

for(int i=temp;i>=0;i--)

{

cout<<" "<<b[i];

}

}

int main()

{

Heap h=Heap();

h.heapsort();

return 0;

}