

/*C Program to implement Heap Sort Algorithm

Input : 1. Size of the Array[n]

2. Array elements

Output : Sorted array A[n]

***/**

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

```
#include<conio.h>
```

```
#include<math.h>
```

```
void heapify(int *,int);
```

```
void build_heap(int *,int);
```

```
void heapsort(int *,int);
```

```
void swap(int *,int *);
```

```
int heapsize;
```

```
int main()
```

```
{
```

```
    int *arr,n,i;
```

```
    printf("\n How many numbers do you want to sort?\n ");
```

```
    scanf("%d",&n);
```

```
    arr=(int *)malloc(sizeof(int)*n);
```

```
    printf("\n\n Enter %d numbers\n ",n);
```

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

```
    {
```

```
        scanf("%d",&arr[i]);
```

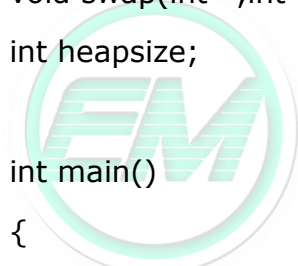
```
    }
```

```
    //heapsize = n;
```

```
    heapsort(arr,n);
```

```
    printf("\n\n The sorted array is \n\n ");
```

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



ENGINEERING MENTOR
STUDY SMARTER, SCORE BETTER

```
{  
    printf("%d ",arr[i]);  
}  
printf("\n\n\n");  
return 0;  
}
```

```
void heapsort(int *arr,int len)
```

```
{  
    int i;  
    build_heap(arr,len);  
    for(i= len-1;i>=1;i--)  
    {  
        swap(&arr[0],&arr[i]);  
        heapsize = heapsize -1;  
        heapify(arr,0);  
    }  
}
```

```
void heapify(int *arr,int i)
```

```
{  
    int l=2*i,r=2*i+1,largest;  
    if(l<heapsize && arr[l]>arr[i])  
        largest = l;  
    else  
        largest = i;  
    if(r<heapsize && arr[r]>arr[largest])  
        largest = r;  
  
    if(largest != i)  
    {
```

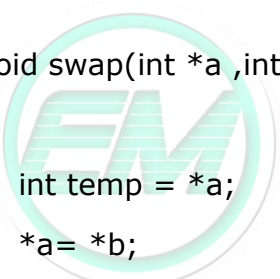
```
        swap(&arr[i],&arr[largest]);
        heapify(arr,largest);
    }
}
```

```
void build_heap(int *arr,int len)
```

```
{
    int i;
    heapsize = len;
    for(i =len/2;i>=0;i--)
    {
        heapify(arr,i);
    }
}
```

```
void swap(int *a ,int *b)
```

```
{
    int temp = *a;
    *a= *b;
    *b= temp;
}
```



ENGINEERING MENTOR
STUDY SMARTER, SCORE BETTER

Sample Input and Output:

```
How many numbers do you want to sort?  
6  
  
Enter 6 numbers  
45 36 10 8 30 24  
  
The sorted array is  
8 10 24 30 36 45  
  
Press any key to continue...
```



ENGINEERING MENTOR
STUDY SMARTER, SCORE BETTER