

Heap

Heap.h

```
typedef struct Heap {  
    int *A;  
    int size;  
    int rear;  
} Heap;
```

```
void initHeap(Heap *h, int size);
```

```
void insert(Heap *h, int key);
```

```
int remove(Heap *h);
```

```
int isEmpty(Heap h);
```

```
int isFull(Heap h);
```



Heap.c

```
void init (Heap *h, int size) {
    h->A = (int *) malloc (sizeof(int) * size);
    if (!h->A)
        return;
    h->size = size;
    h->rear = -1;
}
```

```
void insert (Heap *h, int key) {
    if (!h) return;
    if (!h->A) return;
    h->A[++h->rear] = key;
    int i = h->rear;

    while (i) {
        if (h->A[i] < h->A[(i-1)/2])
            return;
        swap(&h->A[i], &h->A[(i-1)/2]);
        i = (i-1)/2;
    }
}
```

```
int remove (Heap *h) {
    if (!h->A) return INT_MIN;
    if (isEmpty(*h)) return INT_MIN;

    int ele = h->A[0];
    h->A[0] = h->A[h->rear];
    heapify(h);
    return ele;
}
```

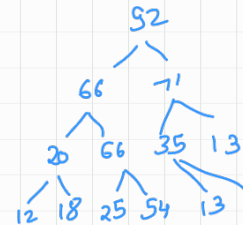
```
void heapify (Heap *h) {
    int i = 0;
    // i left, i right
    int il, ir;
    int maxi, maxl;
    il = 2 * i + 1;
    ir = 2 * i + 2;

    while (il < h->rear) {
        if (ir > h->rear)
            maxi = il;
        if (ir < h->rear)
            if (h->A[ir] > h->A[il])
                maxi = ir;
        else
            maxi = il;

        if (h->A[i] > h->A[maxi])
            return;
        else {
            swap(&h->A[i], &h->A[maxi]);
            i = maxi;
        }
    }
}
```

```
void swap (int *a, int *b) {
    int temp = *a;
    *a = *b;
    *b = temp;
    return;
}
```

Input:



92 | 66 | 71 | 20 | 66 | 35 | 13 | 12 | 18 | 25 | 54 | 13

```
void isEmpty (heap h) {
    return h->rear == -1;
}
```



```
void heapify(Heap *h){
```

```
    int i=0;
```

```
    int il, ir;
```

```
    int imax;
```

```
    int r = h->rear;
```

```
    while(1){
```

```
        il = 2*i+1;
```

```
        ir = 2*i+2;
```

```
        if(il > r) return;
```

```
        if(ir > r){
```

```
            imax = ir;
```

```
        } else {
```

```
            if(h->A[il] > h->A[ir])
```

```
                imax = il;
```

```
            else
```

```
                imax = ir;
```



code can be found on
my Github.

```
void heapify(Heap* h)
```

```
void heapify(Heap* h){
```

```
    int i=0;
```

```
    int il, ir;
```

```
    int
```

Now, that is Pure Art!
And, that is not me,
I can only draw an XD.

