**SPACE COMPLEXITY**

maxHeapify(int i)

|  |  |  |  |
| --- | --- | --- | --- |
| TYPE | VARIABLE | LENGHT OF 1 ATOMIC VALUE | AMOUNT OF ATOMIC VALUES |
| INPUT | i | 32 bits | 1 |
| AUXILARY | None | 0 | 0 |
| OUTPUT | None | 0 | 0 |

Total space complexity = 1 + 0 + 0 = θ(1)

Auxiliar space complexity = none

Output + auxiliar space complexity = none

delete(K key)

|  |  |  |  |
| --- | --- | --- | --- |
| TYPE | VARIABLE | LENGHT OF 1 ATOMIC VALUE | AMOUNT OF ATOMIC VALUES |
| INPUT | key | 32 bits | n |
| AUXILARY | j | 32 bits | 1 |
| OUTPUT | None | 0 | 0 |

Total space complexity = n + 1 + 0 = θ(n)

Auxiliar space complexity = 1

Output + auxiliar space complexity = 1 + 0 = θ(1)

**TEMPORAL COMPLEXITY**

public void delete(K key) throws NoValueFoundException{  
 int k= key.hashCode();  
 int j = Math.abs(k%ARR\_SIZE);  
 HNode<K, V> object = arr[j];  
 boolean flag = false;  
 int error = 0;  
  
 if(arr[j]!=null && arr[j].getKey().equals(key)){  
 //COMPROBAR  
 arr[j].setPrevious(null);  
 arr[j] = object.getNext();  
 error = 1;  
 } else {  
 while(object!=null && !flag) {  
 if (object.getKey().equals(key)) {  
 object.getPrevious().setNext(object.getNext());  
 error = 1;  
 if (object.getNext() != null) {  
 object.getNext().setPrevious(object.getPrevious());  
 }  
 flag = true;  
 } else {  
 object = object.getNext();  
 }  
 }  
 }  
  
 if(error == 0){  
 throw new NoValueFoundException();  
 }  
  
}



1+1+n+1+1+1+1+1+1+1+n+1+n+n+n+n+n+n+n+n+1+1 = 12 + 10n = θ(n)

private void maxHeapify(int i) {  
 int largest;  
 int l = 2 \* i;  
 int r = 2 \* i + 1;  
  
 if (l < arr.size() && arr.get(l).getKey() > arr.get(i).getKey()) {  
 largest = l;  
 } else {  
 largest = i;  
 }  
  
 if (r < arr.size() && arr.get(r).getKey() > arr.get(i).getKey()) {  
 largest = r;  
 }  
 HeapNode maxTemp;  
 HeapNode minTemp;  
 if (largest != i) {  
 maxTemp = arr.get(largest);  
 minTemp = arr.get(i);  
  
 arr.set(largest, minTemp);  
 arr.set(i, maxTemp);  
 maxHeapify(largest);  
 }  
}



1+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1 = 17 = θ(1)



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