- Priority Queue

Implement Priority Queue (pq) using max heap, all the elements are stored in the Integer array A, n indicates the size of pq. Let us assume the capacity of the pq is 10, you can see it from the main function the length of A is 10, you do not need to use dynamic array to enlarge its size. When n = 10, you cannot insert anymore elements. In previous homework we use 0 to represent empty element, this time we use null. You should implement the following functions:

(a) buildheap(): build a heap from array A

(b) heapify(i): apply heapify on element A[i]

(c) insert(int x): insert x into pq

(d) int maximum(): returns the element of pq with the largest value

(e) int extract-max(): removes the element of pq with the largest value

(f) increase-value(i, val): increases the value of A[i] to the new value val

(g) decrease-value(i, val):decreases the value of A[i] to the new value val