1) Sort the following sequence using heap sort.

22 80 18 9 90 12 22 57 86 36

Show each heap before extracting the maximum.

2) Describe an algorithm which deletes an item with index $i$ from an $n$-element max-heap. Your algorithm should run in $O(\log n)$ time.

3) Show how to implement a first-in, first-out queue with a priority queue. Show how to implement a stack with a priority queue.