

Homework #4

P1: Is the sequence [23, 17, 14, 6, 13, 10, 1, 5, 7, 12] a max-heap?

P2: Illustrate the operation of HEAP-EXTRACT-MAX on the heap $A = [15, 13, 9, 5, 12, 8, 7, 4, 0, 6, 2, 1]$.

P3: The operation HEAP-DELETE(A, i) deletes the item in node i from heap A . Give an implementation of HEAP-DELETE that runs in $O(\log n)$ time for an n -element max-heap.

Write the procedure in pseudocode. i is the index of element in the array.

P4: The code for MAX-HEAPIFYMAX-HEAPIFY is quite efficient in terms of constant factors, except possibly for the recursive call in line 10, which might cause some compilers to produce inefficient code. Write an efficient MAX-HEAPIFYMAX-HEAPIFY that uses an iterative control construct (a loop) instead of recursion.