Lab 3

Analysis of *d*-ary heaps

A ***d*-ary heap** is like a binary heap, but (with one possible exception) non-leaf nodes have d children instead of 2 children.

(1) How would you represent a d-ary heap in an array? (10%)

(2) What is the height of a d-ary heap of n elements in terms of n and d? (10%);

(3) Given an efficient implementation of EXTRACT-MAX in a d-ary max-heap. Analyze its running time in terms of d and n. (20%);

(4) Given an efficient implementation of INSERT in a d-ary max-heap. Analyze its running time in terms of d and n. (20%);

(5) Give an efficient implementation of INCREASE-KEY(A, i, k), which first sets $A[i] \leftarrow \max(A[i], k)$ and then updates the d-ary max-heap structure appropriately. Analyze its running time in terms of d and n. (20%);

(6) Document. (20%)