Assignment 6
2020-10-28,
12 minutes

Question 1 (Removing from Maximum Heap

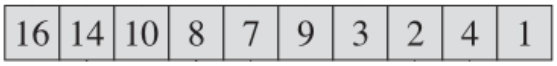

Figure 1: Array for a Max-Heap

The image shows array used to store Maximum Heap (a data structure allowing inserts and removal of the maximum element). The array starts with the 0th element (and any parent node in such tree should always be at least as big as any of its children).

(A) Draw the initial heap based on this array. Heap should be drawn as a complete binary tree.

(B) Run the command DeleteMax(H) on this initial heap. Draw the resulting binary tree (after the heap invariant is restored – any parent node is at least as big as its children). Draw the binary tree image you get.

(C) On the tree that you got in the previous step **(B)** run the command Insert(H, x), where $x = a + b + c$ is the sum of the last three digits of your student ID. Draw the binary tree image you get.

(D) Show the array for the binary tree you got in the previous step **(C)** (i.e. right after the DeleteMax(H) and Insert(H, x) commands have been executed).