CS 240E: Structures and Data Management **Winter 2021**

Tutorial 3: AVL Trees

Warmup (optional). Let T be an AVL tree with n nodes and height h. If $N(h)$ is the minimal number of nodes T can have, then show that $N(h) \geq 2^{\frac{h}{2}}$.

1. Give an algorithm for inserting in an AVL-tree that does not have parent references.

2. Let a 2-AVL tree be a binary search tree where for every node, the difference of heights of its left and right subtree is at most 2. Prove that a 2-AVL tree has height at most $3 \log n$ where n is the number of nodes in the tree.