

ALGORITHMS, FALL 2018, HOMEWORK 6

Due Thursday, October 18 at 11:59pm.

Worth 1% of the final grade.

We will cover red-black trees on Thursday the 11th.

1. In a fully balanced (symmetric) binary search tree (BST) with n nodes, the root has rank $\lceil \frac{n}{2} \rceil$. Given a BST that is a valid red-black tree, how extreme (e.g., how low) could the rank of the root be? Use Θ -notation for your answer, otherwise lower order terms may become annoying. Include a description or drawing of a tree that corresponds to your answer (in other words explain how you're getting your answer).