Homework 3

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# Written Part

## 12.3-3

Worst case: , when the tree-insert operations created a linear chain of nodes

Best case: , when the tree-insert operations created a binary tree of height .

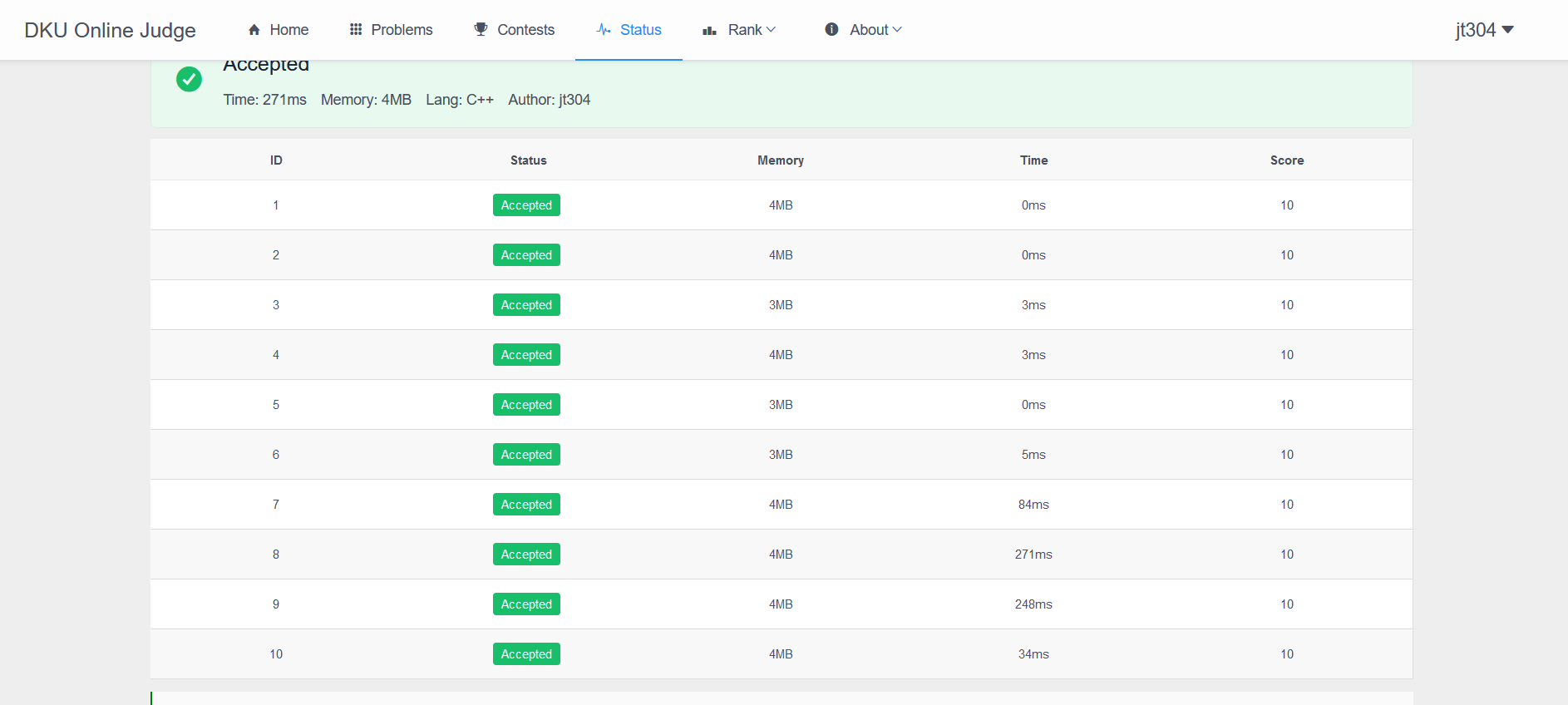
## 12-1

1. Each insertion will add the element to the right of the rightmost leaf according to the code. Thus, the running time is
2. This strategy will result in each of the two children subtrees having a difference in size at most one. This means that the height of the tree will be . So, the total runtime will be
3. This will only take linear time. Because the tree itself will be height , and a single insertion into a list can be done in constant time.
4. Worse case: every random choice is to the right (or all to the left) this will result in the same behavior as in (a)

Expected running time: roughly speaking, we will pick left roughly half the time, so the tree will be almost balanced. Therefore, we have that the depth is roughly . Then the running time is

# DKUOJ

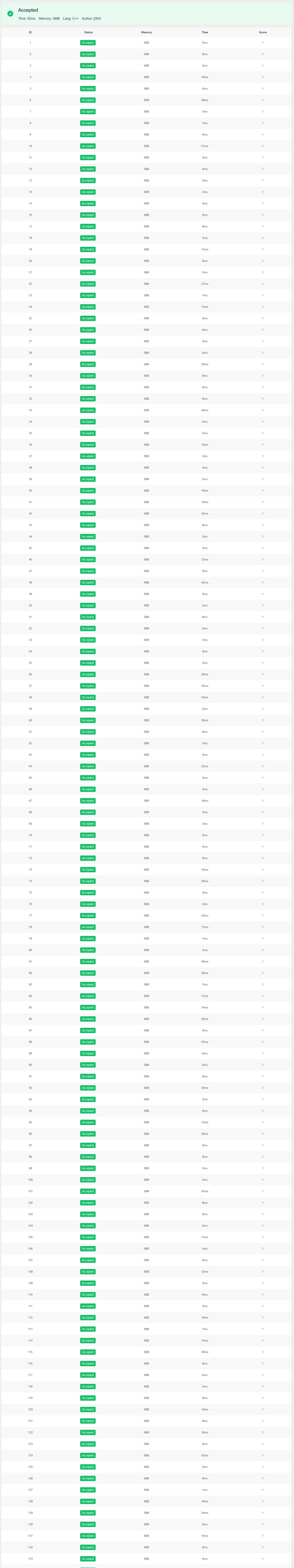
Problem 5



Problem 6



Problem 15



Problem 21

