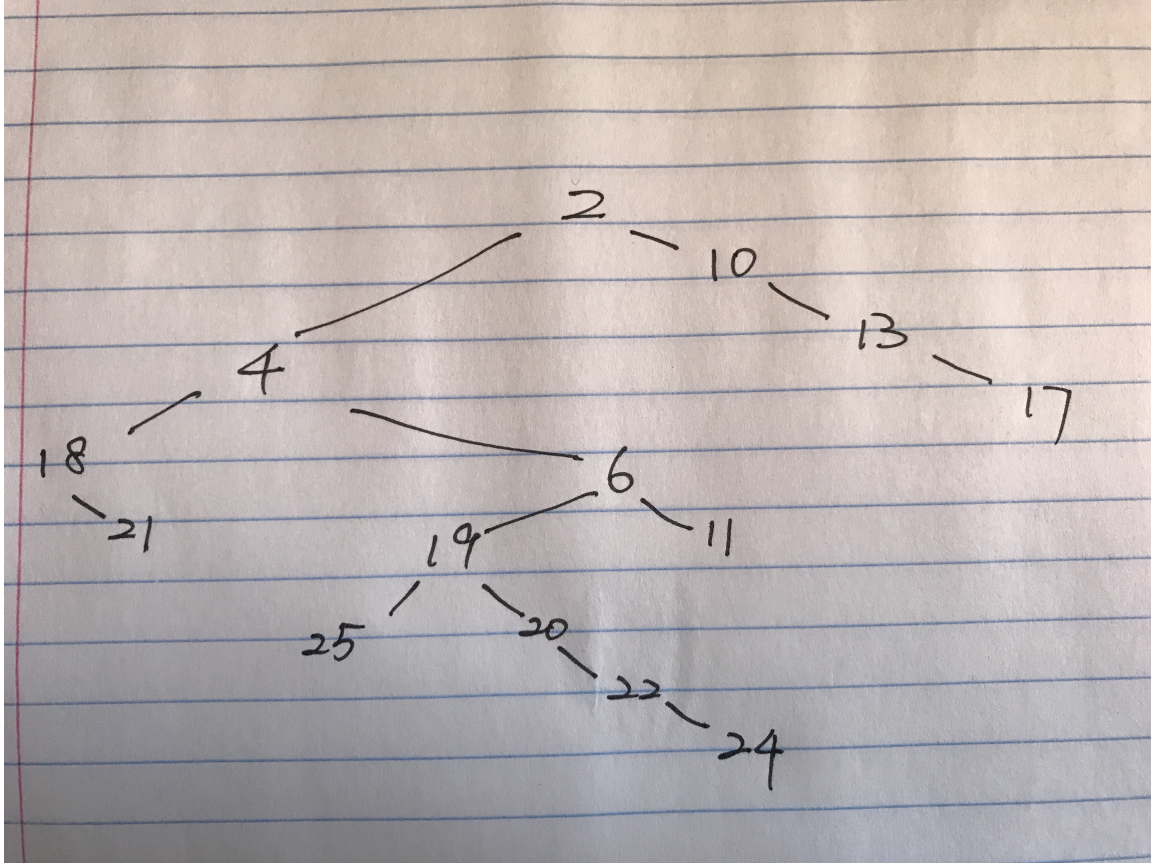


HomeWork 6

June 9, 2017

Liangjian Chen

Problem 1 **Solution:**

The query between node 24 and node 13.

Problem 2 **Solution:**

$(2, 0) \rightarrow (4, 1) \rightarrow (18, 2) \rightarrow (21, 3) \rightarrow (18, 2) \rightarrow (4, 1) \rightarrow (6, 2)$
 $\rightarrow (19, 3) \rightarrow (25, 4) \rightarrow (19, 3) \rightarrow (20, 4) \rightarrow (22, 5) \rightarrow (24, 6) \rightarrow (22, 5)$
 $\rightarrow (20, 4) \rightarrow (19, 3) \rightarrow (6, 2) \rightarrow (11, 3) \rightarrow (6, 2) \rightarrow (4, 1) \rightarrow (2, 0)$
 $\rightarrow (10, 1) \rightarrow (13, 2) \rightarrow (17, 3) \rightarrow (13, 2) \rightarrow (10, 1) \rightarrow (2, 0)$

Assume 0-index, positions are 12 and 22.

Problem 3 **Solution:**

----- can not occur in this sequence, because the depth of tree is 6 and it is impossible to decrease depth consecutively 6 times.

Problem 4 **Solution:**

When $LCA(x, y)$ is not x , first step is to the x 's father. In the case of $LCA(x, y) = x$, if $LCA(x$'s left son, $y)$ is x 's left son, go left son, otherwise right son.

Therefore we make LCA query at most twice.