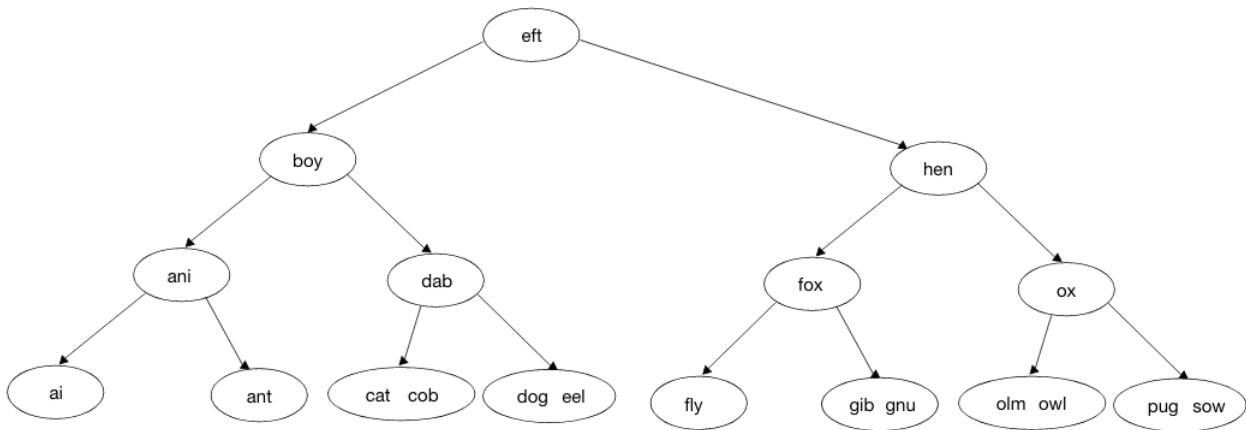
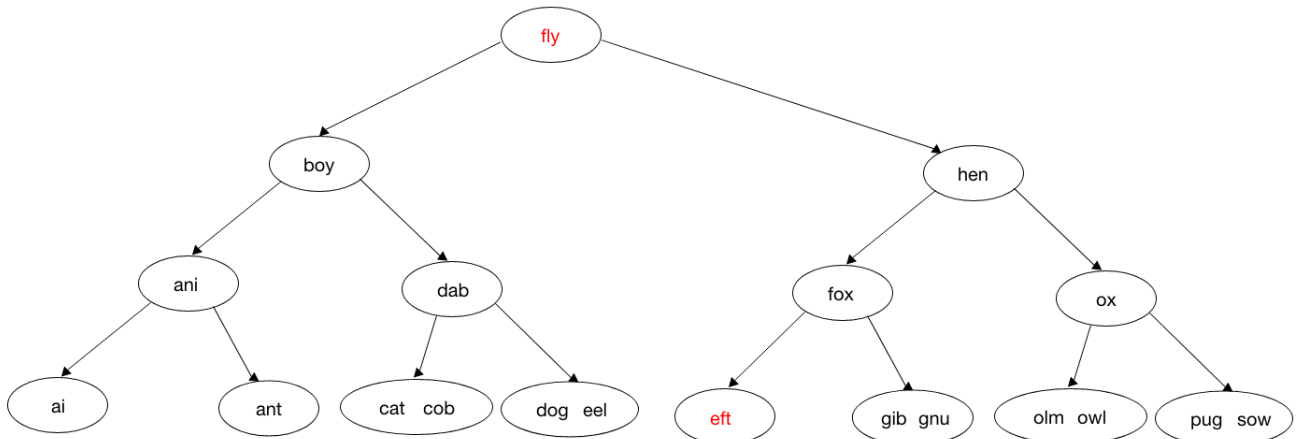


Problem 1

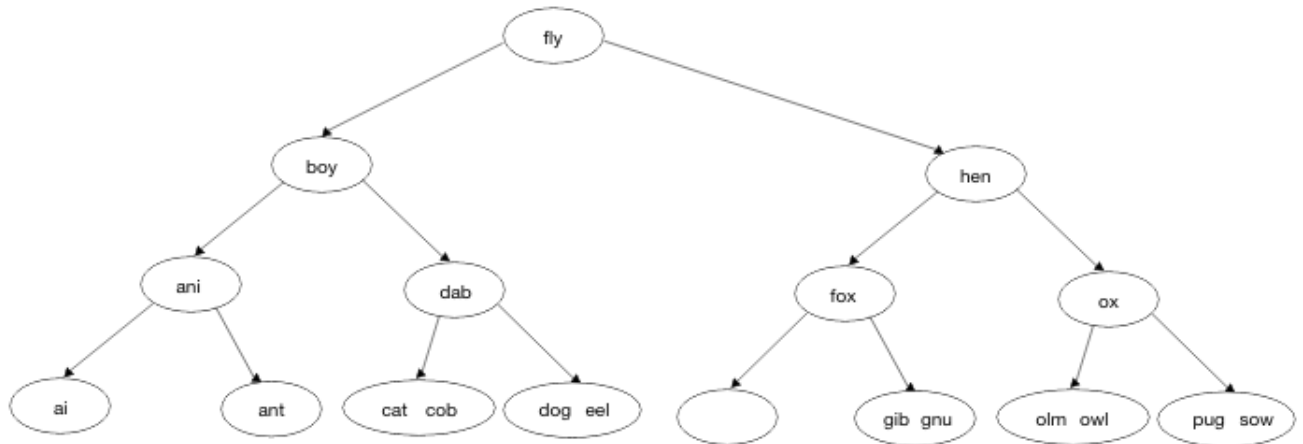
Show all steps in deleting 'eft' from the following B-tree using the successor.



0.1 Switch with successor.

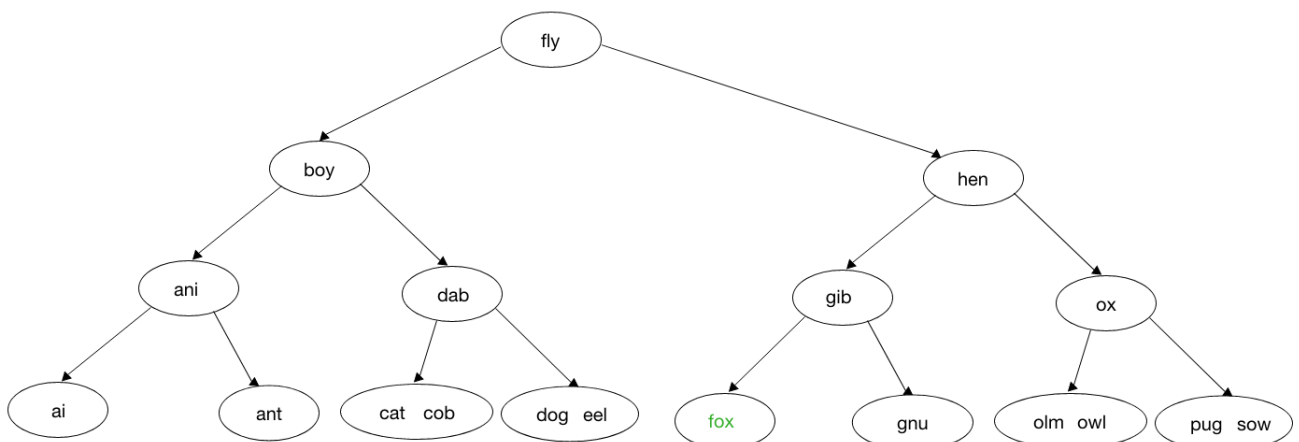


0.2 Delete.



Leads to an underflow must left-rotate

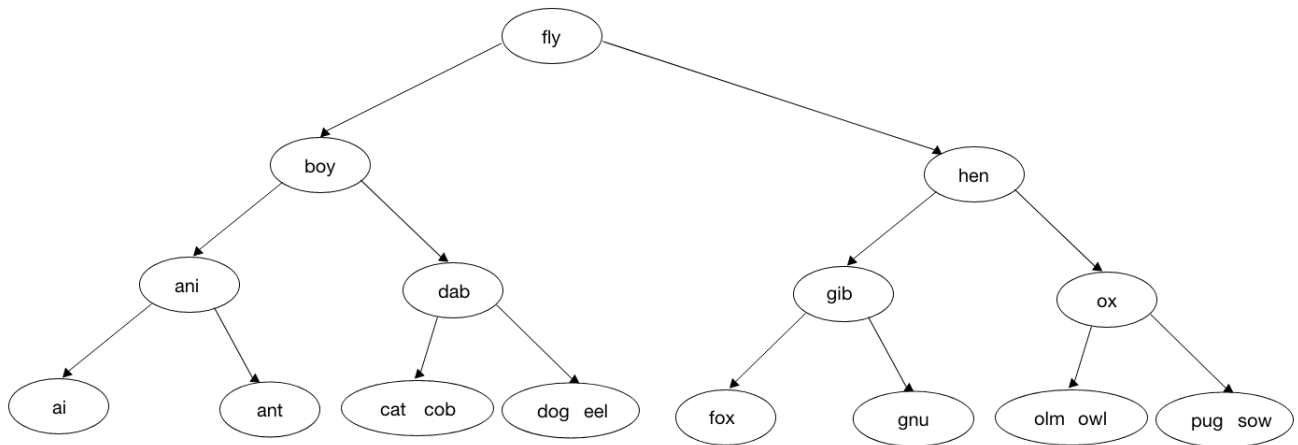
0.3 Left-rotate



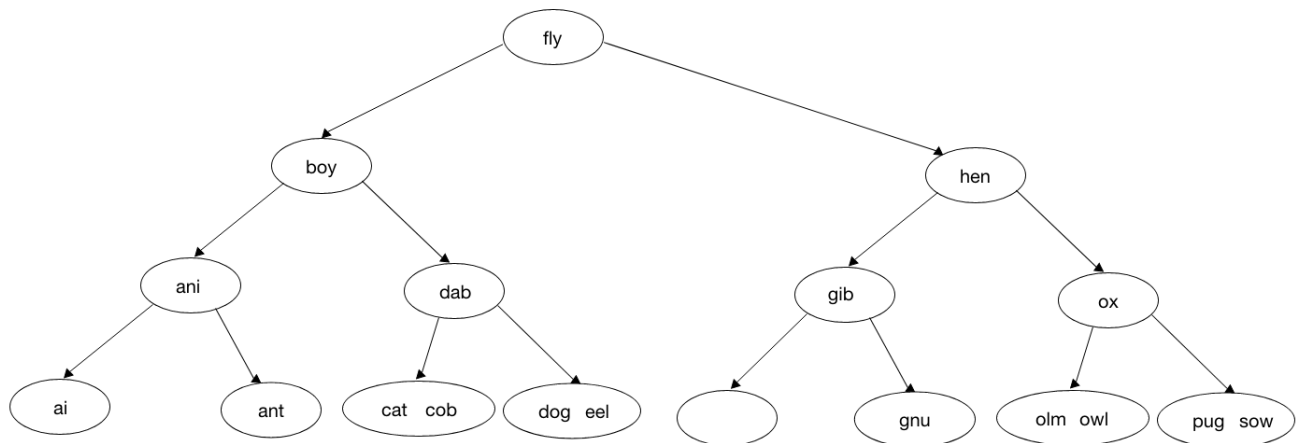
Now we are balanced.

Problem 2

Show all steps in deleting 'fox' from the following B-tree using the predecessor.



0.4 Delete.

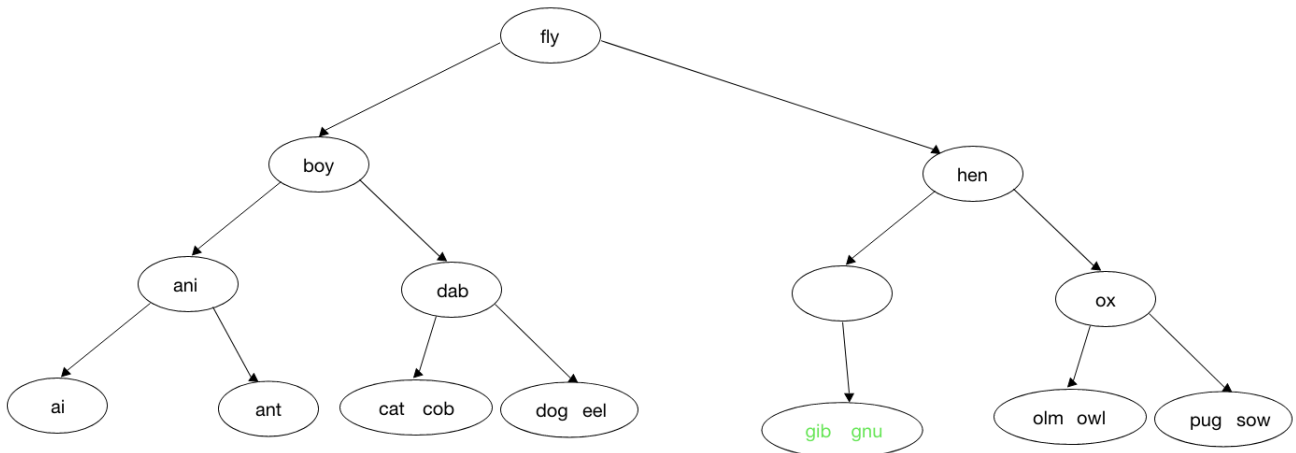


Fox is already a leaf node, so just delete.

This leads to an underflow, can't left or right rotate.

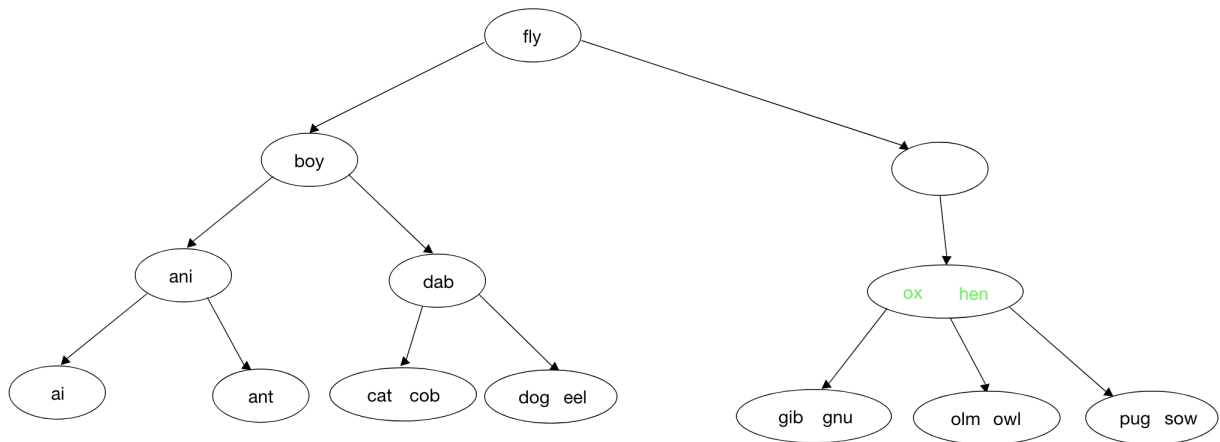
We need to do a merge.

0.5 Merge



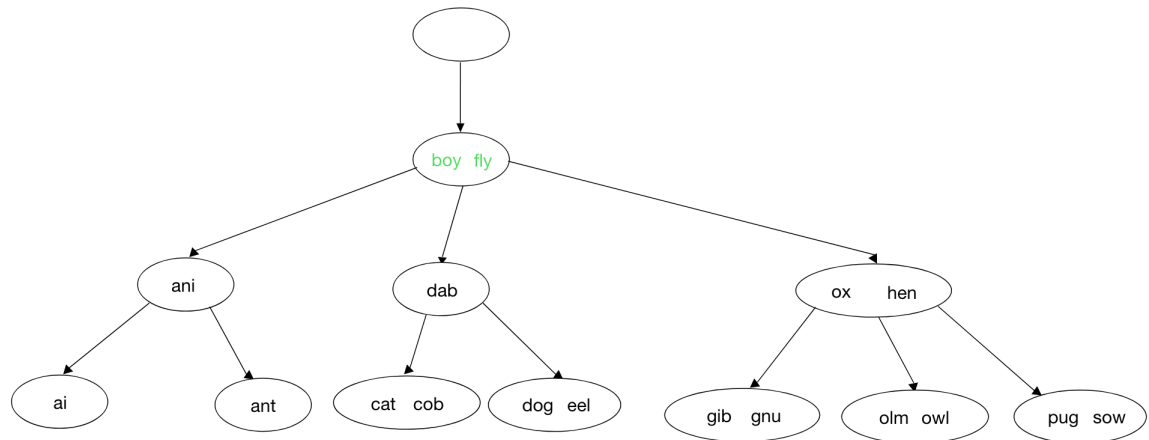
We cannot rotate so we must merge again.

0.6 Merge(2)



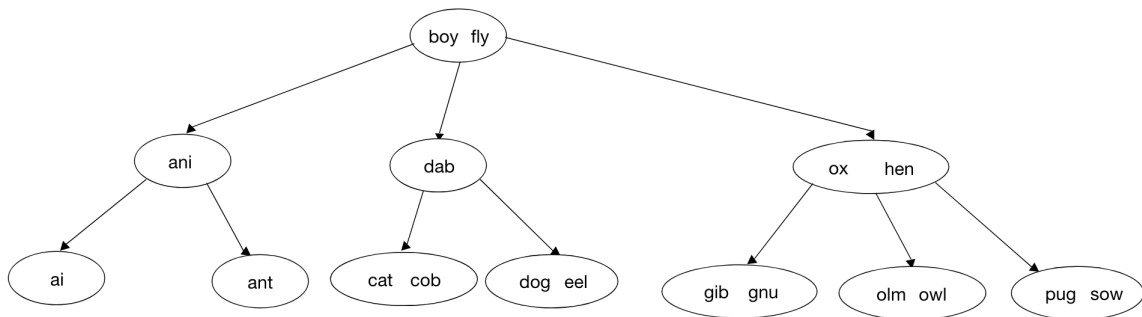
Once again cannot rotate so we must merge.

0.7 Merge(3)



Now we can restore the tree's balance by deleting the empty root node.

0.8 Deletion



Now the tree is once again balanced.