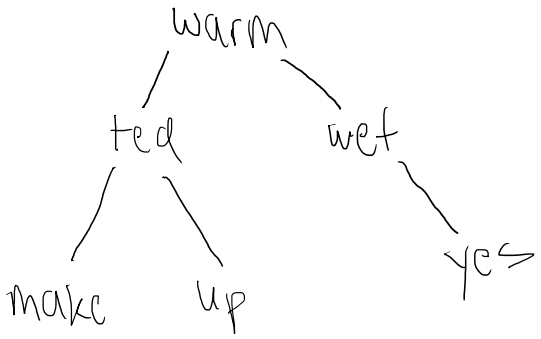
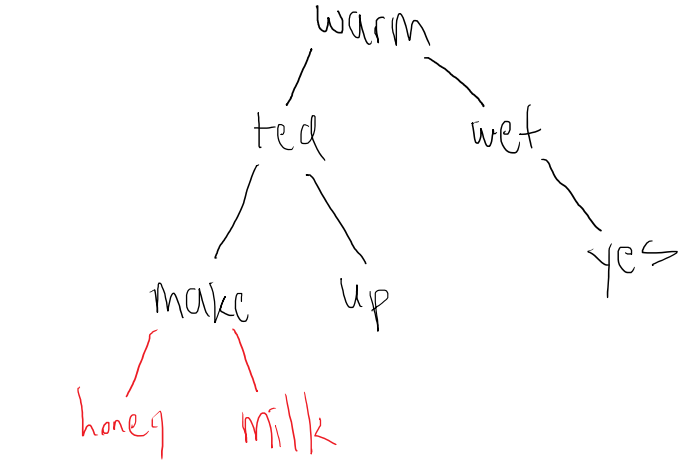
CSCB63 TUT4 WEEK3
andrewyk.leung@mail.utoronto.ca
https://snoopysnipe.github.io/ta/b63w21/

HANDOUT: https://mathlab.utsc.utoronto.ca/bretscher/b63/tutorials/tutorial-03.pdf



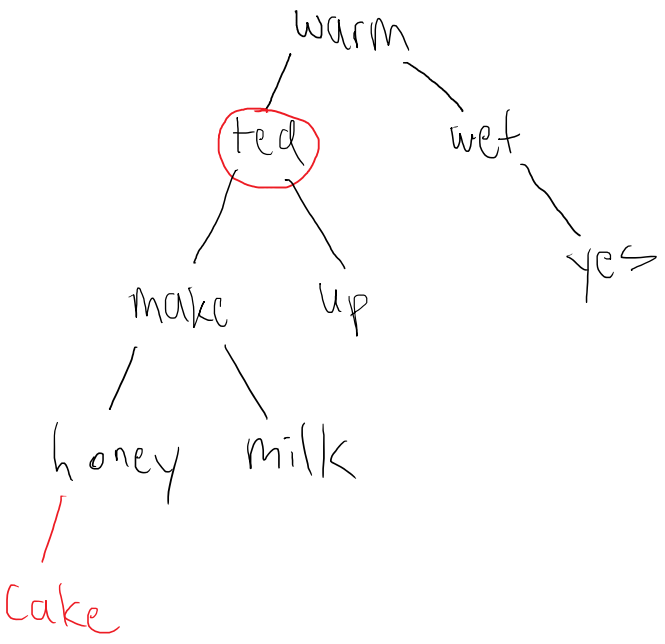

# AVL Insert

Insert honey, milk:

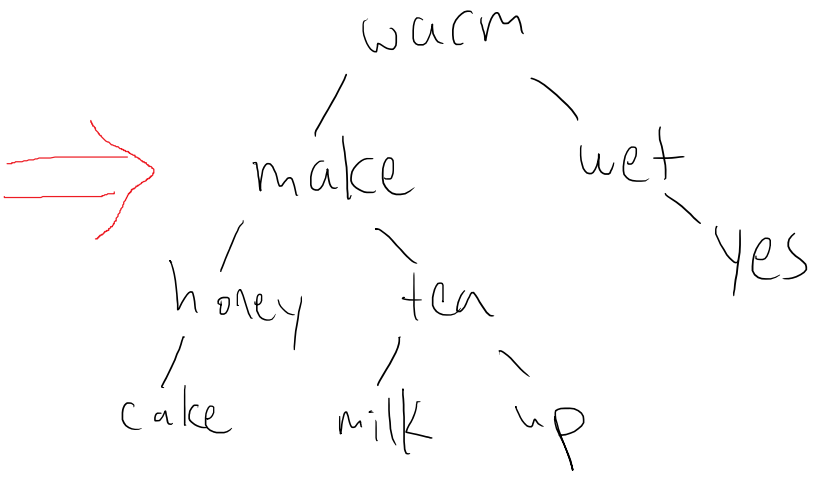



no rotation

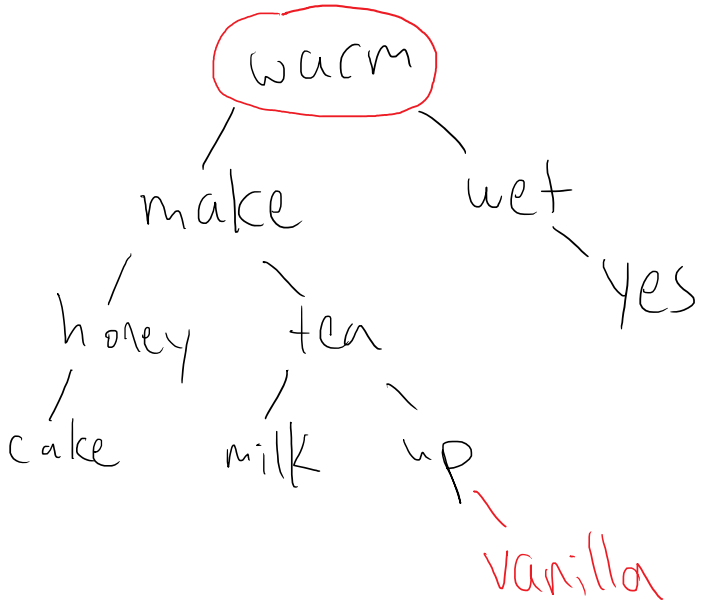
Insert Cake:



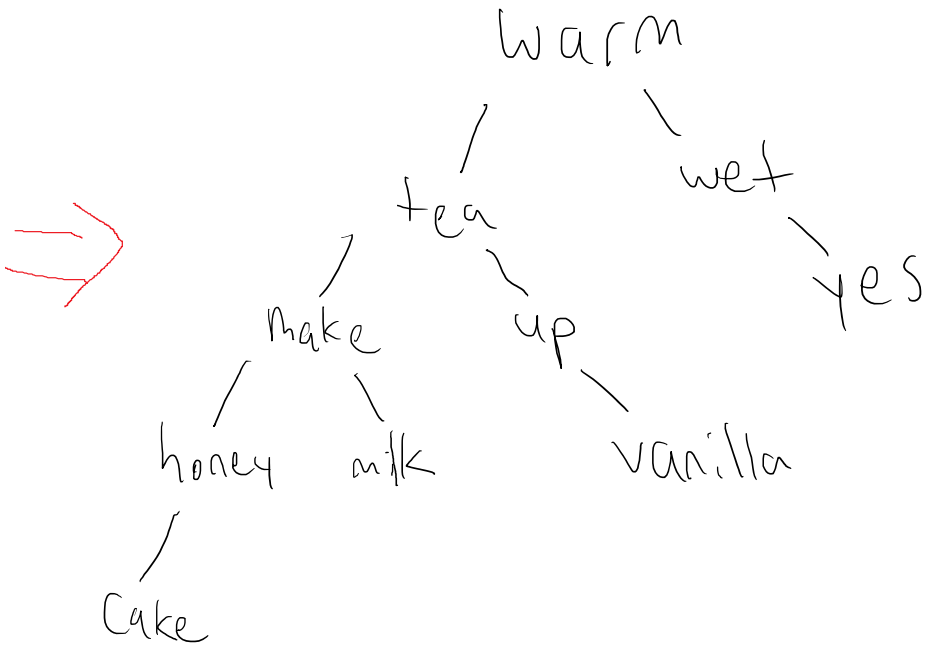

Single rotation CW

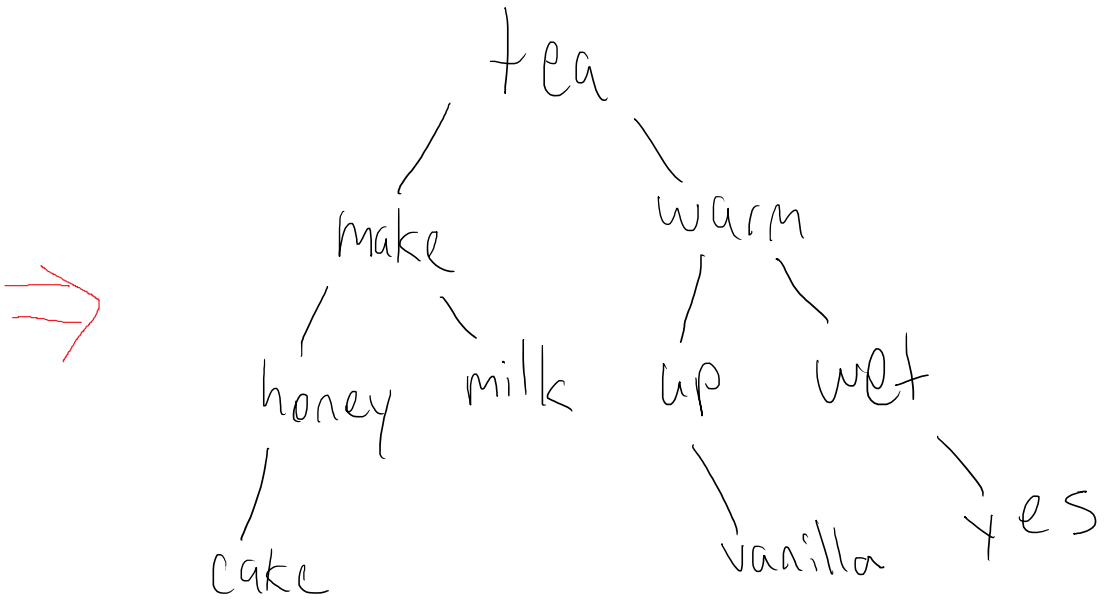


Insert Vanilla:

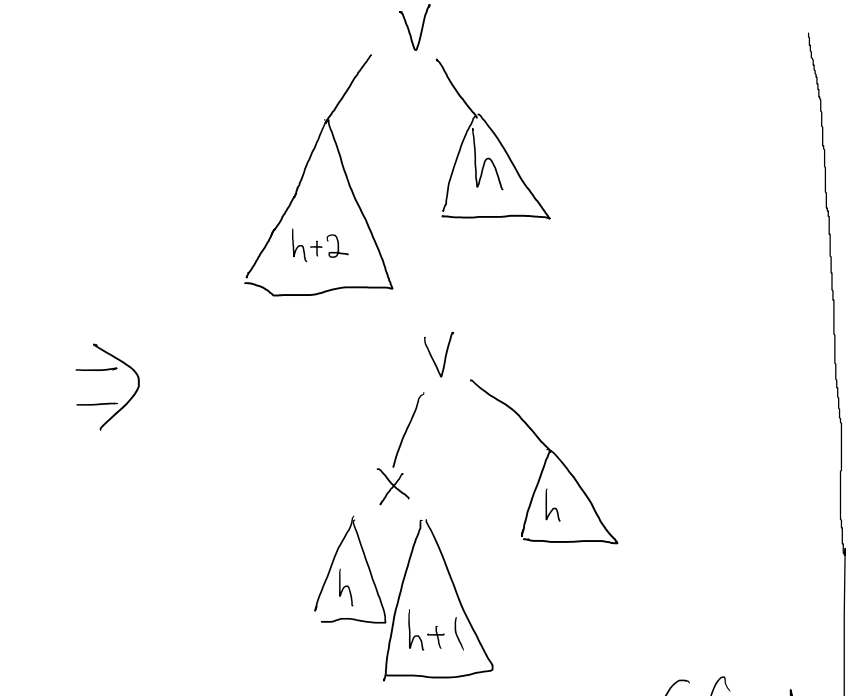



Double rotation CCW then CW

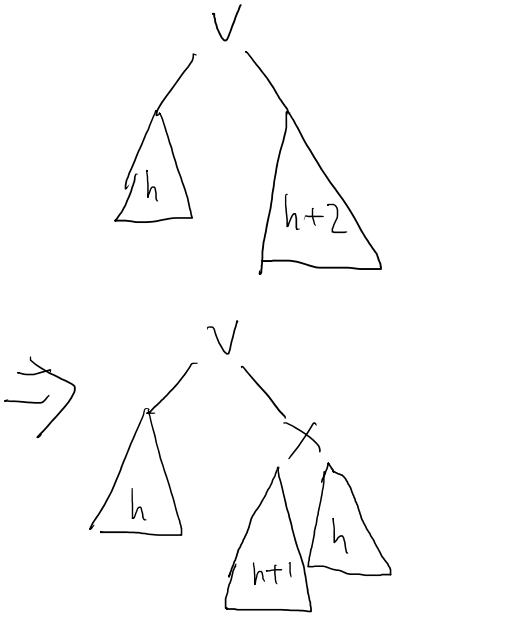





# DOUBLE ROTATIONS

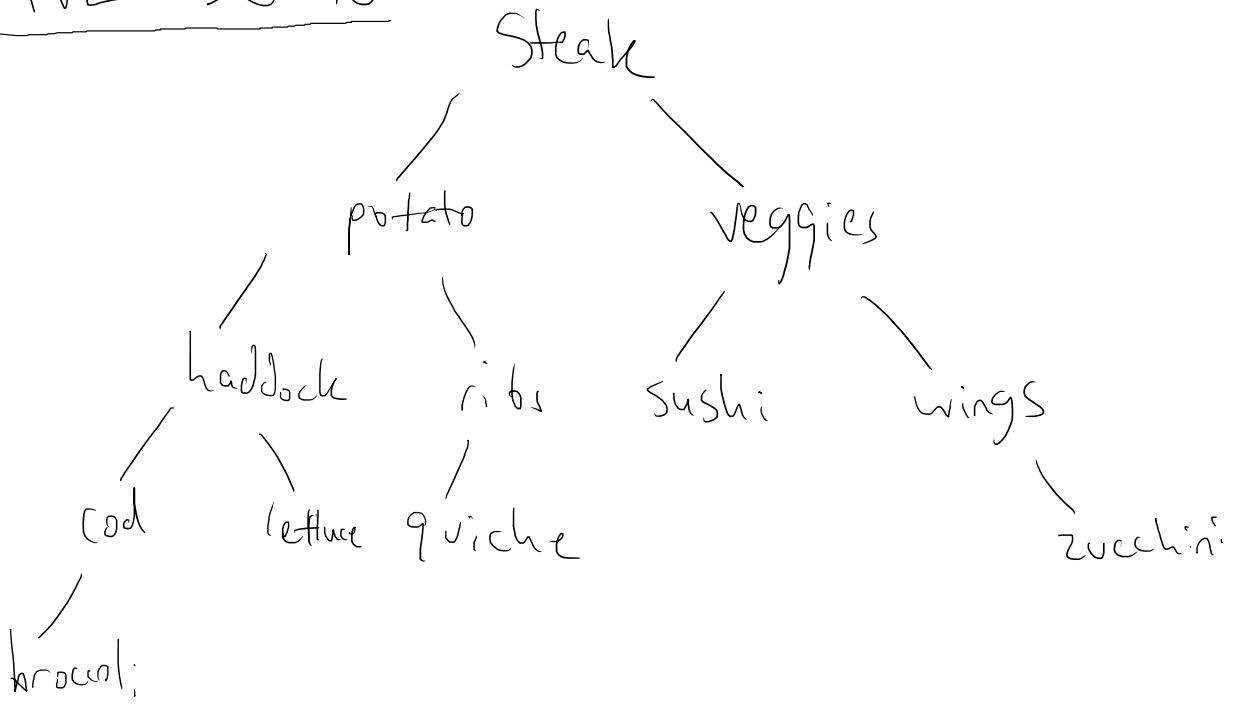



rotate at x CCW
rotate at v CW



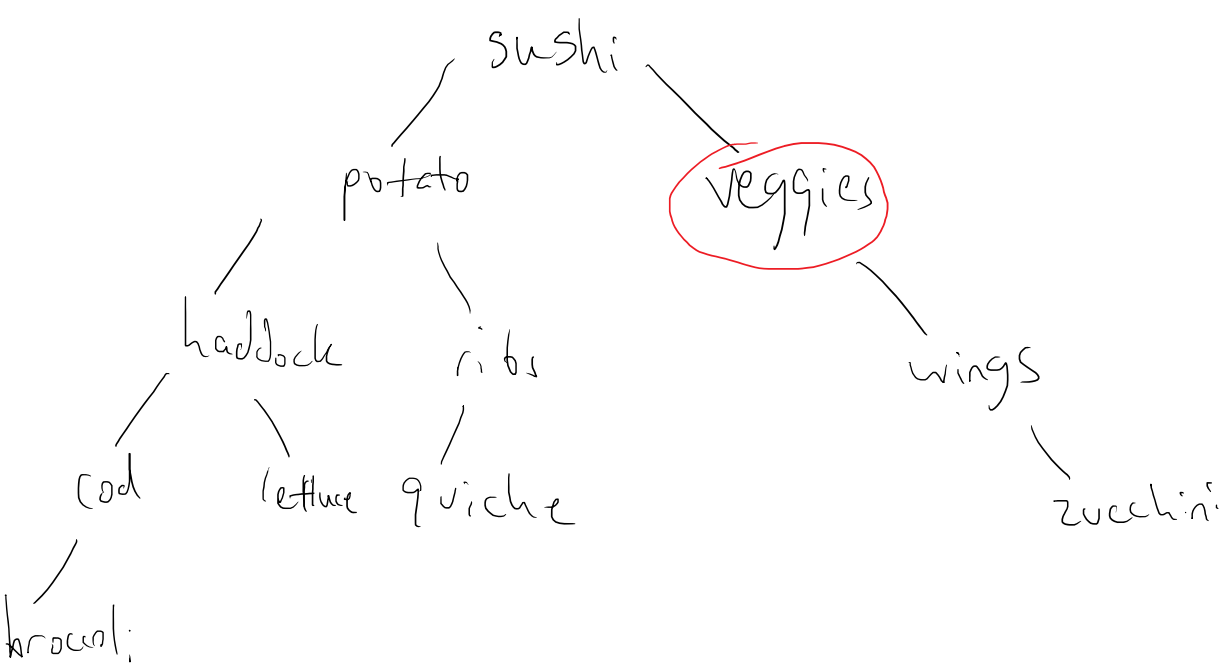

rotate at x CW
rotate at v CCW

# AVL Delete:

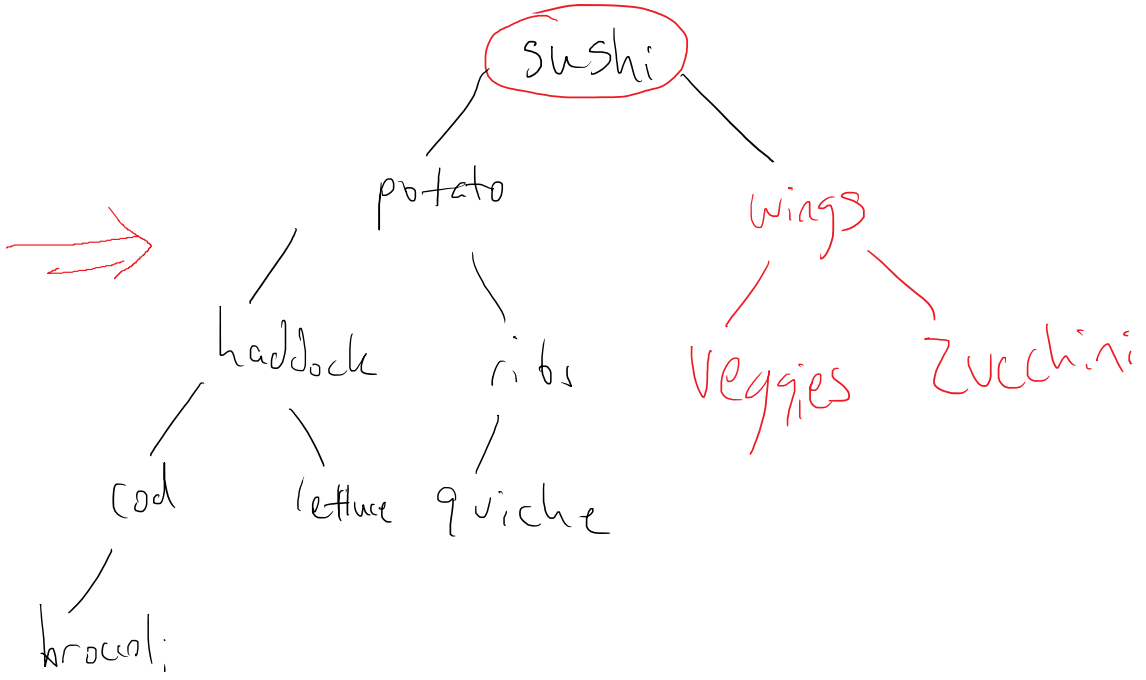



Delete steak

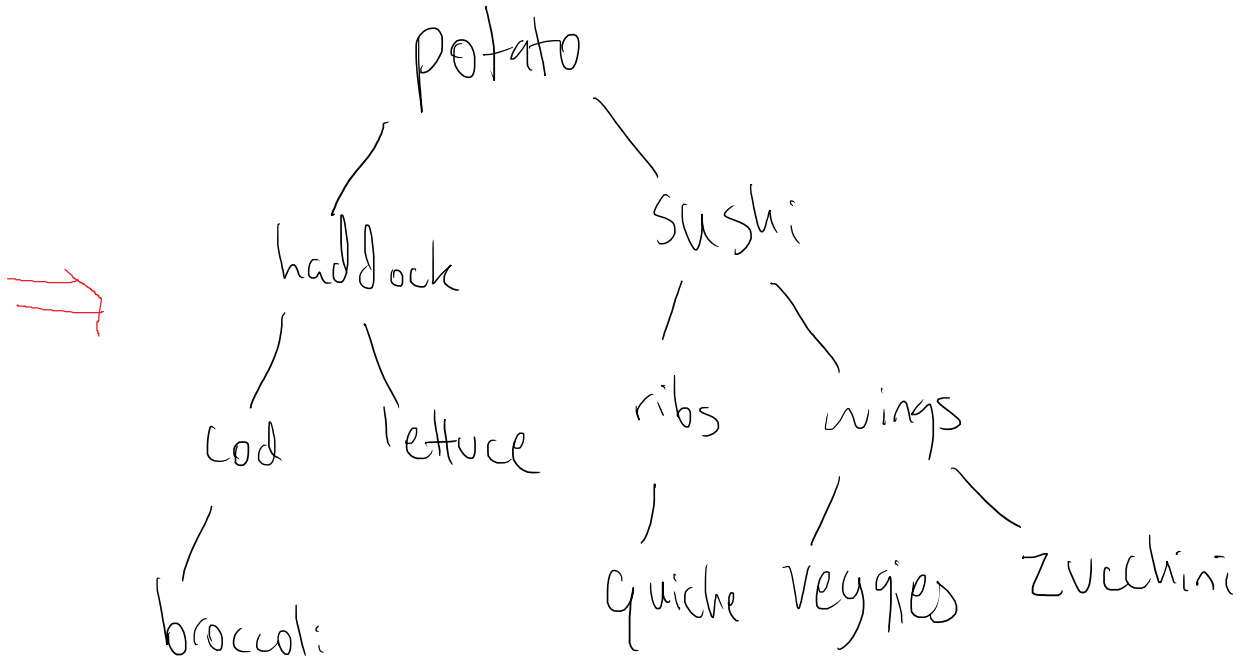
replace with successor sushi



Single rotation CCW




Single rotation CW



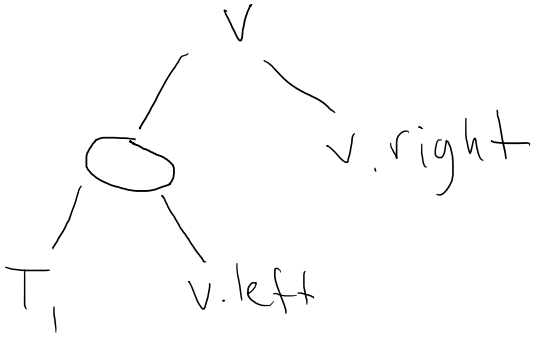
Exercise

General Algorithm:

Assume keys in $T_1$ < keys in $T_2$

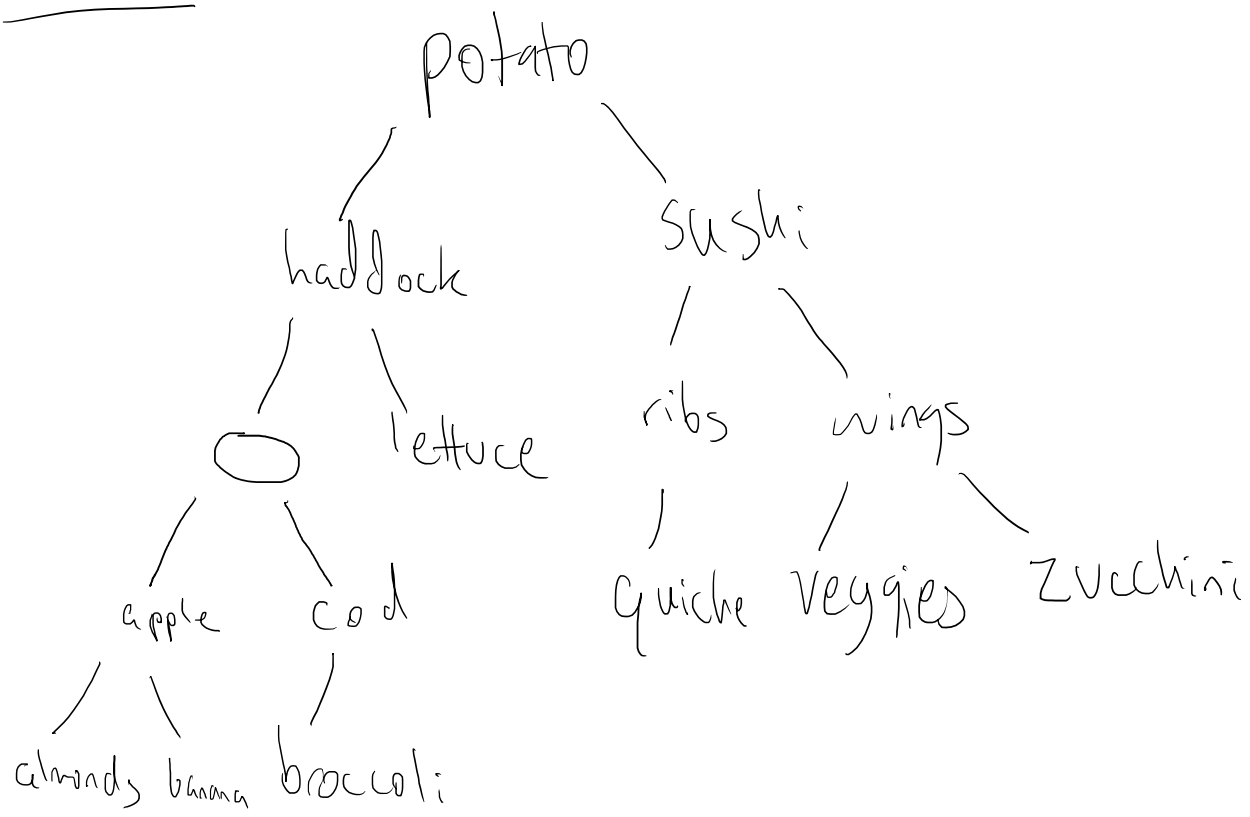
height of $T_1$ < height of $T_2$

1. Go down left path of $T_2$ until find node v where height(v) > height($T_1$)
2. v's subtree becomes

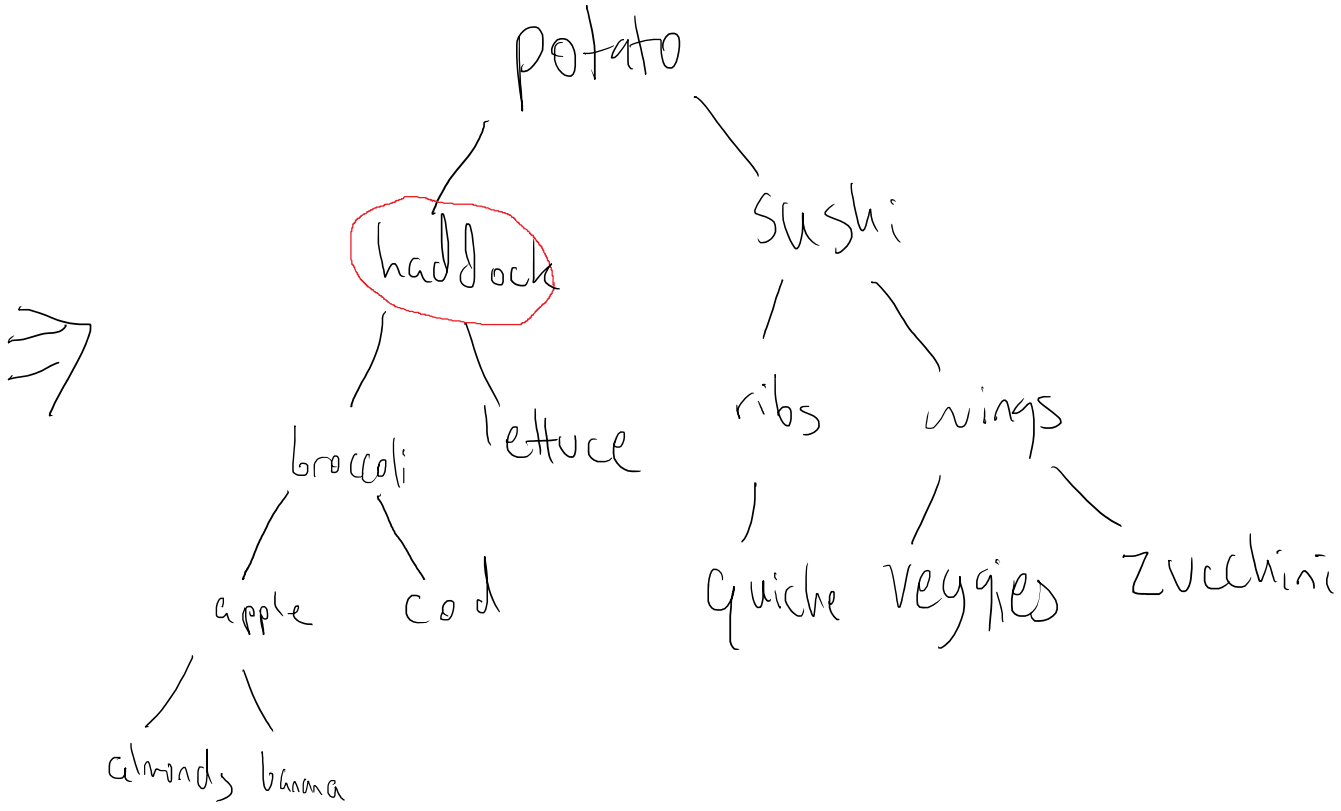


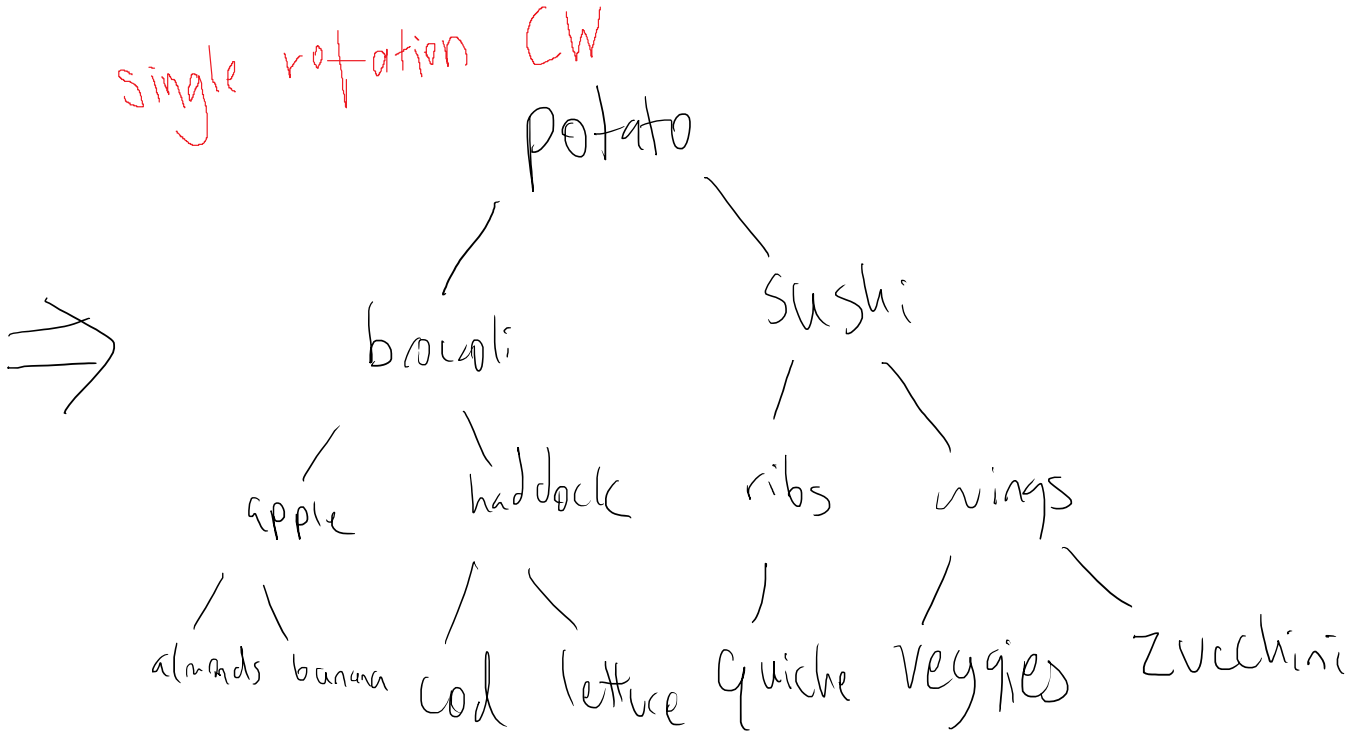

3. replace empty node with predecessor/successor and rebalance starting from v then up

example:




use broccoli




Single rotation CW
potato
broccoli
sushi
apple
haddock
ribs
wings
almonds
banana
cod
lettuce
quiche
veggies
zucchini