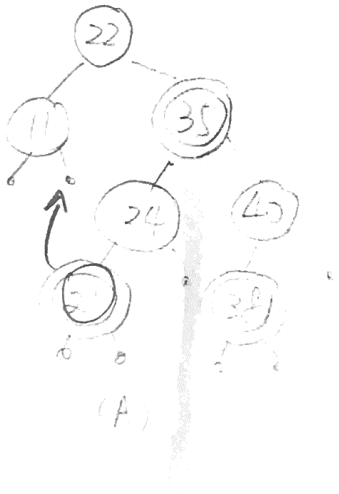
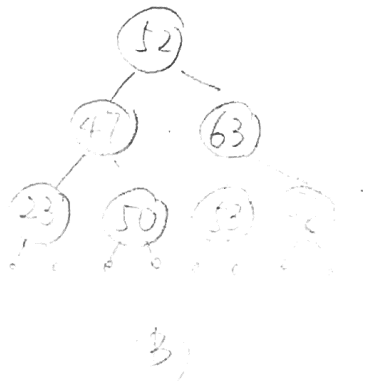
COMP.4040 Practice – Red Black Tree

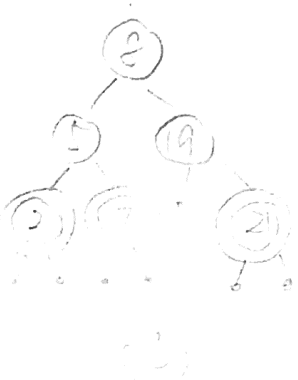
Name (PRINT): PHONG VO

1. (20 points) Are the following legal Red-Black Trees? A node in single circle is a Black node and a node in double circle is a Red node.

	Yes	No
A		N
B	Y	
C	Y	
D		N







Black height of 2 6

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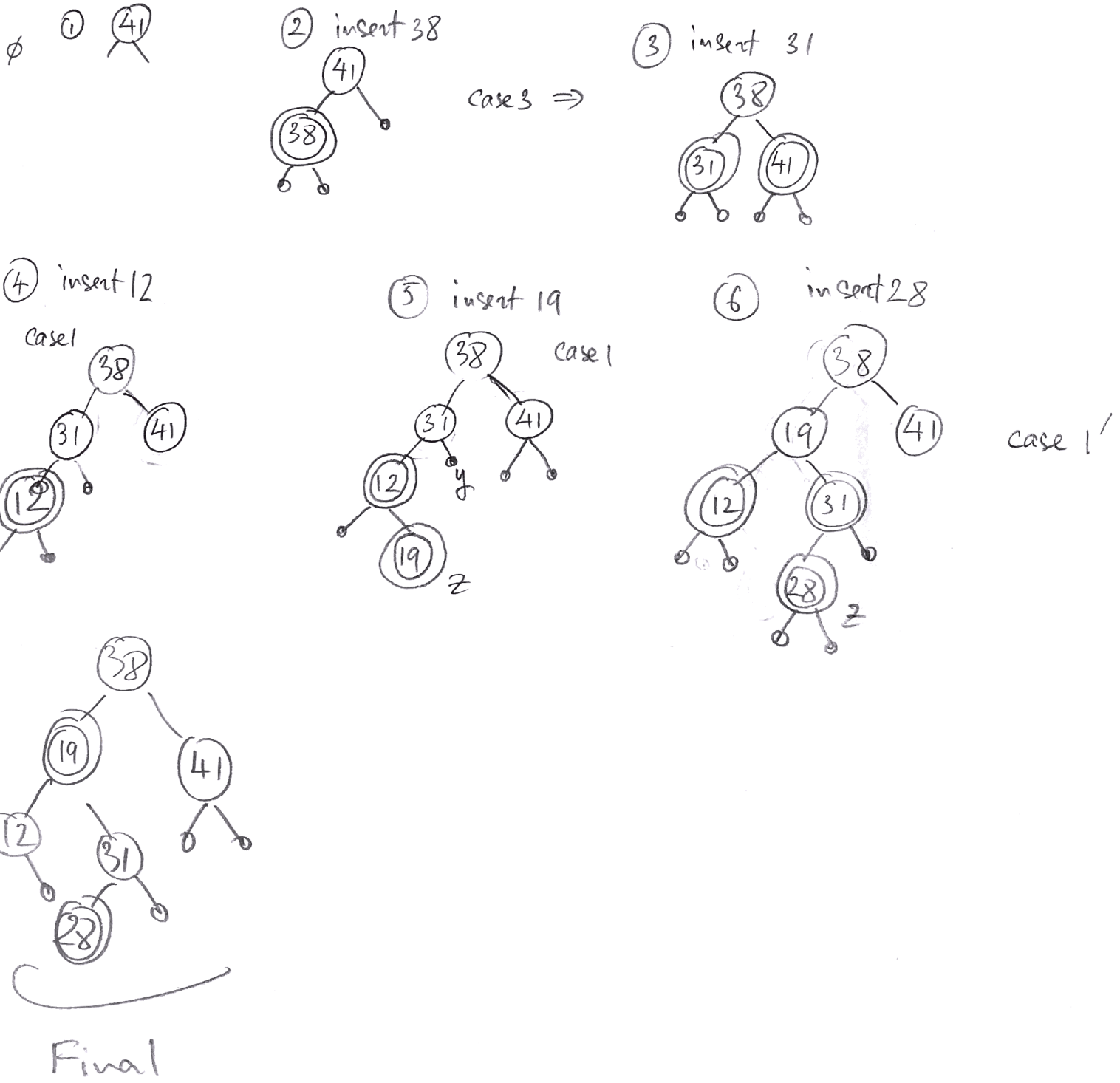
2. (20 points) Show the sequence of red-black trees that result after successively inserting the keys into an initially empty red-black tree T in the order given: K = < 41, 38, 31, 12, 19, 28 >. You should use the algorithm(s) provided in the textbook/notes. Show at least one tree resulting from each insertion. Be sure to state which case from the textbook applies when applicable. Assume that the root is always colored black. Please mark black node and red node clearly.

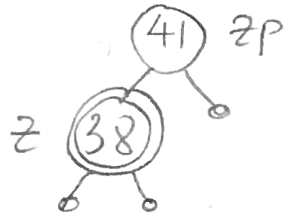


RBTree Practice Red Black Tree

K = <41, 38, 31, 12, 19, 28>

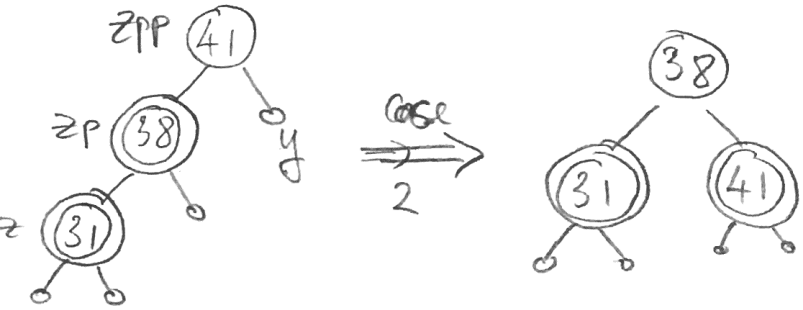
(1) insert 41

(2) insert 38:

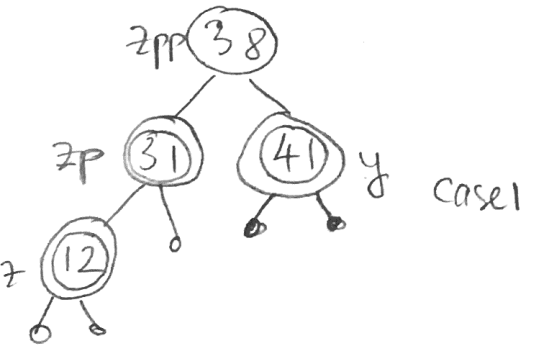


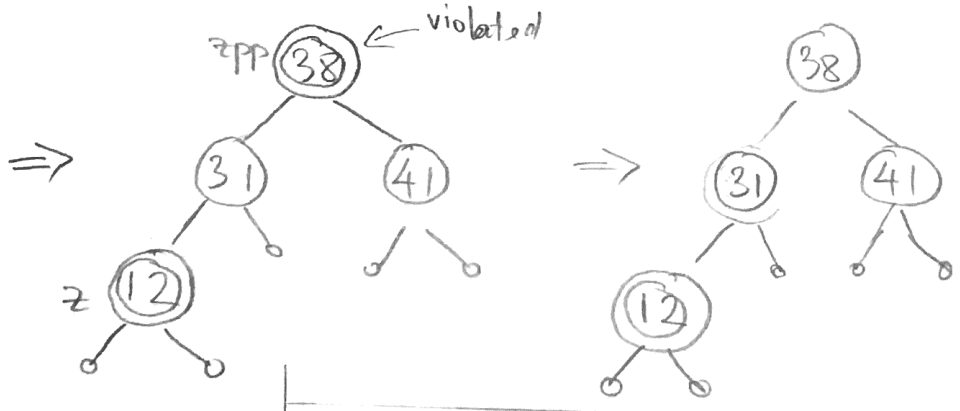
zp is BLK ⇒ no fixing needed

(3) insert 31:

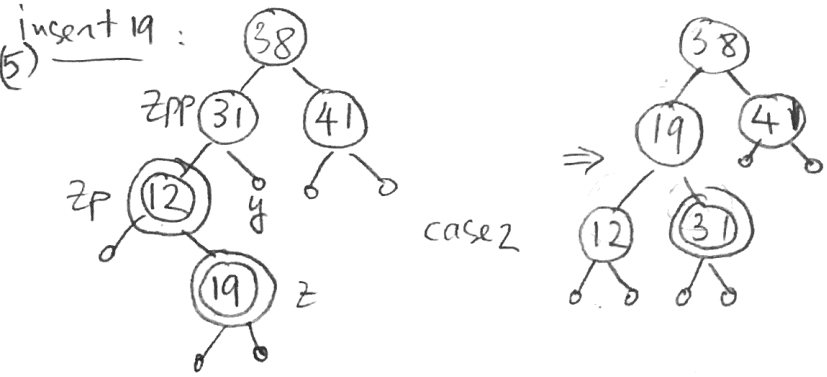


(4) insert 12:





(5) insert 19:



(6)