W12 - Red Black Tree Functions

Due 2 Apr at 23:59 **Points** 20 **Questions** 9
Available 27 Mar at 9:00 - 2 Apr at 23:59 **Time limit** None
Allowed attempts Unlimited

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Attempt history

	Attempt	Time	Score
LATEST	Attempt 1	2 minutes	20 out of 20

Correct answers are hidden.

Score for this attempt: **20** out of 20
Submitted 2 Apr at 12:49
This attempt took 2 minutes.

Question 1

2 / 2 pts

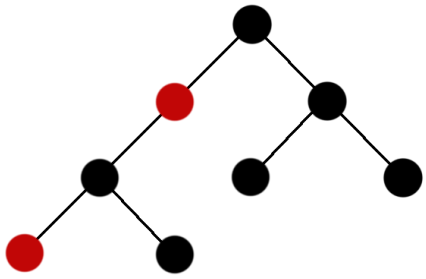
A Red-Black Tree stores just one bit of extra information compared to a normal BST.

- (●) True
- ( ) False

Question 2

2 / 2 pts

Which of the three properties does this Red-Black tree violate? (values omitted)

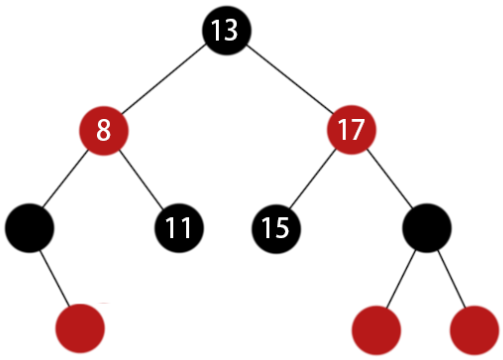


- Red Property
- Black Depth Property
- Root Property

Question 3

3 / 3 pts

Which of the operation will be performed after adding 12 to this Red-Black tree?

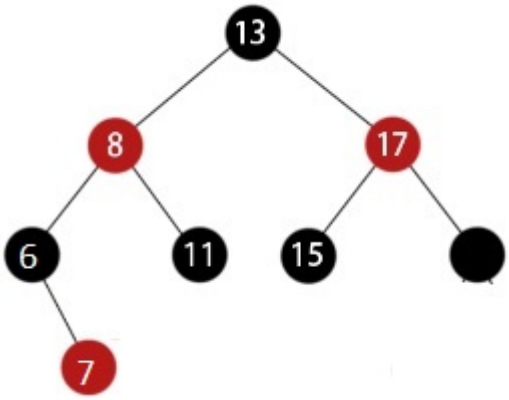


- Restructuring
- Rotation
- Recoloring
- No such operation

Question 4

2 / 2 pts

What will be the black depth of the Red Black Tree after **add(7.5)** is performed on it?



- 3
- 4
- 2
- 1

Question 5

2 / 2 pts

The **remove** operation could increase the black depth of the red-black tree.

- True
- False

Question 6

2 / 2 pts

Match the Red Black Tree functions with their Big-O time complexities.

find	O(log n)
add	O(log n)
remove	O(log n)

Question 7

2 / 2 pts

Which of the following is NOT a property of Red-Black tree?

- [x] Sibling nodes should be of the same colour.
- [x] Every leaf node has same number of red ancestors.
- [ ] Every leaf node has same number of black ancestors.
- [ ] The root node must be black.
- [ ] A red node can not have a red child.

Question 8

2 / 2 pts

The purpose of adding colours to Red-Black trees is to ensure that there are:

- O(logn) restructurings for each delete.
- O(1) recolorings and O(h) restructurings.
- O(h) recolorings and O(1) restructurings.
- O(logn) restructurings for each insert.

Question 9

3 / 3 pts

Why do we need Red-Black trees when we already have self-balancing AVL trees?

- Red-Black trees are shallower than AVL trees.
- The height of red-black tree is shorter than that of AVL tree.
- Red-Black trees require fewer restructurings than AVL trees.
- Red-Black trees are more rigidly balanced than AVL trees.

Quiz score: **20** out of 20