

Unit 8 - Week 6

Course outline

How does an NPTEL online course work?

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Week 2

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Week 6

● Lecture 26: Randomly build BST

● Lecture 27: Red Black Tree

● Lecture 28: Red Black Tree (Cont...)

○ Lecture 29: Augmentation of data structure

● Lecture 30: Interval trees

● Week 6: Lecture note

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Details Solution

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Assignment 6

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-11, 23:59 IST.

1) Let x be a node in a binary search tree. If y is a node in the right subtree of x ,

- (a) $key[y] \leq key[x]$
(b) $key[y] \geq key[x]$

- a.
 b.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

1 point

2) The algorithm in which the key of the root of a subtree is printed after the values in its subtrees is called

- (a) inorder tree walk
(b) preorder tree walk
(c) postorder tree walk
(d) none of the above

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

1 point

3) The expected height of a randomly built binary search tree on n keys is

- (a) $\mathcal{O}(n \log n)$
(b) $\mathcal{O}(\log n)$
(c) $\mathcal{O}(n)$
(d) $\mathcal{O}(n^2)$

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

1 point

4) Which of the following is NOT a property of a red black tree

- (a) Every node is either red or black.
(b) The root is red.
(c) Every leaf (NIL) is black.
(d) If a node is red, then both its children are black.

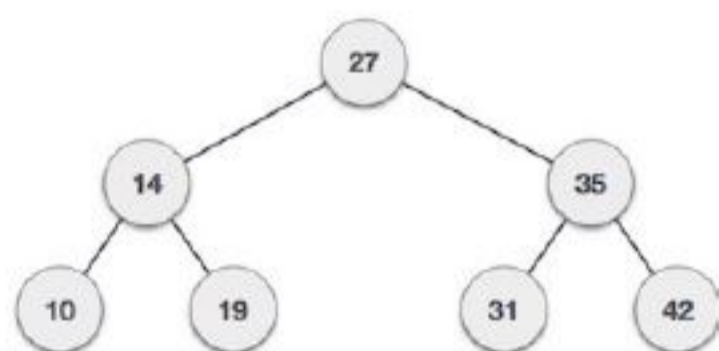
- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

1 point

5) Consider the Red Black Tree given below, given that the node containing key value 35 is red, how many black nodes are there in the red black tree?(Do not count the nils)



- (a) 3
(b) 2
(c) 5
(d) 6

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

1 point

6) The largest possible number of internal nodes in a red-black tree with black-height k is

- (a) $2^{2k} + 1$ internal nodes.
(b) $2^k - 1$ internal nodes.
(c) $2^{2k} - 1$ internal nodes.
(d) $2^k + 1$ internal nodes.

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

1 point

7) If f is a convex function and X is a random variable, then according to Jensen's Inequality

- (a) $f((E[X])) \geq E[f(X)]$
(b) $f((E[X])) \leq E[f(X)]$
(c) $f((E[X])) < E[f(X)]$
(d) $f((E[X])) > E[f(X)]$

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

1 point

8) Every n -node binary search tree, there are exactly

- (a) $n - 1$ possible rotations
(b) n possible rotations
(c) $n + 1$ possible rotations
(d) $2n$ possible rotations

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

1 point

9) In the Order Statistic Tree, along with the key, what other information is stored in the nodes? (Here $size(left[x])$ is size of left subtree of node x and similarly $size(right[x])$ is size of right subtree of node x .)

- (a) $size(left[x])$
(b) $size(right[x])+1$
(c) $size(left[x])+size(right[x])+1$
(d) None of these

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

1 point

10) Given the following numbers, arrange them into a Binary Search Tree. Let the root be at position 1. If a node is at position i , the right child will be at position $2i + 1$ and left child at $2i$ (i.e. the right child of root will be at position 3). While forming a binary search tree by inserting 9, 5,1,12,6,7,8 in order, which positions will be filled?

- (a) 1,2,3,4,5,11,23
(b) 1,2,3,6,5,10,20
(c) 1,2,4,8,3,6,12
(d) 1,2,3,4,5,6,12

- a.
 b.
 c.
 d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

1 point