ZJUADS_cy2020_MidTermExam

判断题 10 | A. 单选题 11 | 程序填空题 2

2-1 Insert { 5, 1, 7, 8, 21, 2, 12, 19, 13, 0 } into an initially empty 2-3 tree (with splitting). Which one of the following statements is FALSE? (5分)

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- A. 13 and 19 are in the same node
- B. the parent of the node containing 8 has 3 children
- C. the first key stored in the root is 12
- D. there are 5 leaf nodes

2-1 答案错误 (0 分) 创建提问

2-2 To solve the optimal binary search tree problem, we have the recursive equation $c_{ij} = \min_{i \le l \le j}\{w_{ij} + c_{i,l-1} + c_{l+1,j}\}$. To solve this equation in an iterative way, we must fill up a table as follows: (5分)

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- A.
```
for i= 1 to n-1 do;
  for j= i to n do;
    for l= i to j do
```
- B.
```
for j= 1 to n-1 do;
   for i= 1 to j do;
     for l= i to j do
```
- C.
```
for k= 1 to n-1 do;
  for i= 1 to n-k do;
     set j = i+k;
     for l= i to j do
```
- D.
```
 for k= 1 to n-1 do;
   for i= 1 to n do;
      set j = i+k;
      for l= i to j do
```

2-2 答案错误 (0 分) 创建提问

2-3 When solving a problem with input size N by divide and conquer, if at each step, the problem is divided into 4 sub-problems and each size of these sub-problems is $N/2$, and they are conquered in $O(N^2 logN)$. Which one of the following is the closest to the overall time complexity? (5分)

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- A. $O(N^2 logN)$
- B. $O(N^2)$
- C. $O(N^3 logN)$
- D. $O(N^2 log^2 N)$

2-3 答案正确 (5 分) 创建提问

2-4 Merge the two leftist heaps in the following figure. Which one of the following statements is FALSE? (5分)

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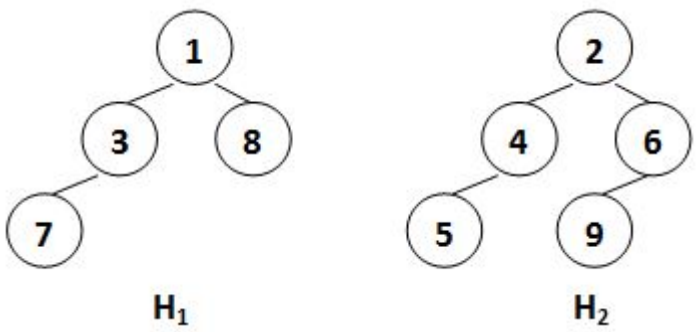

- A. the null path length of 6 is the same as that of 2
- B. 1 is the root with 3 being its right child
- C. Along the left most path from top down, we have 1, 2, 4, and 5
- D. 6 is the left child of 2

2-4 答案正确 (5 分) 创建提问

2-5 Given 4 cases of frequences of four characters. In which case(s) that the total bits taken by Huffman codes are the same as that of the ordinary equal length codes? (5分)

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- (1) 1 2 2 3
- (2) 1 1 1 2
- (3) 2 2 3 5
- (4) 1 2 3 4

- A. (1) and (2)
- B. (3) only
- C. (1), (2) and (4)
- D. (2) only

2-5 答案错误 (0 分) 创建提问

2-6 For the result of accessing 5 in the splay tree in the following figure, besides saying that 5 must be the root, which one of the following statements is also TRUE? (5分)

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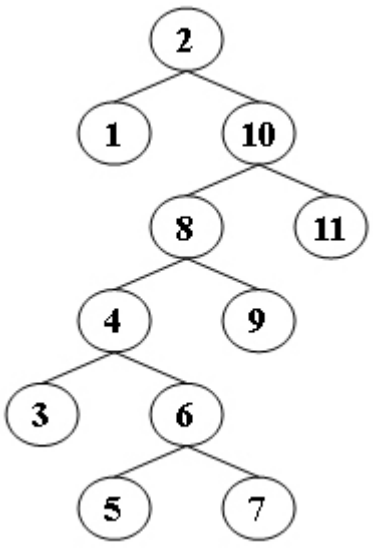

- A. 2 and 10 are siblings
- B. 4 and 10 are siblings
- C. 6 and 10 are siblings
- D. 6 is a leaf node

2-6 答案错误 (0 分) 创建提问

2-7 When doing amortized analysis, which one of the following statements is FALSE? (2分)

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- A. For potential method, a good potential function should always assume its maximum at the start of the sequence
- B. For accounting method, when an operation's amortized cost exceeds its actual cost, we save the difference as credit to pay for later operations whose amortized cost is less than their actual cost
- C. Aggregate analysis shows that for all n, a sequence of n operations takes worst-case time $T(n)$ in total. Then the amortized cost per operation is therefore $T(n)/n$
- D. The difference between aggregate analysis and accounting method is that the later one assumes that the amortized costs of the operations may differ from each other

2-7 答案正确 (2 分) 创建提问

2-8 Given the following game tree, which node in the right subtree is the first node to be pruned with α-β pruning algorithm? (5分)

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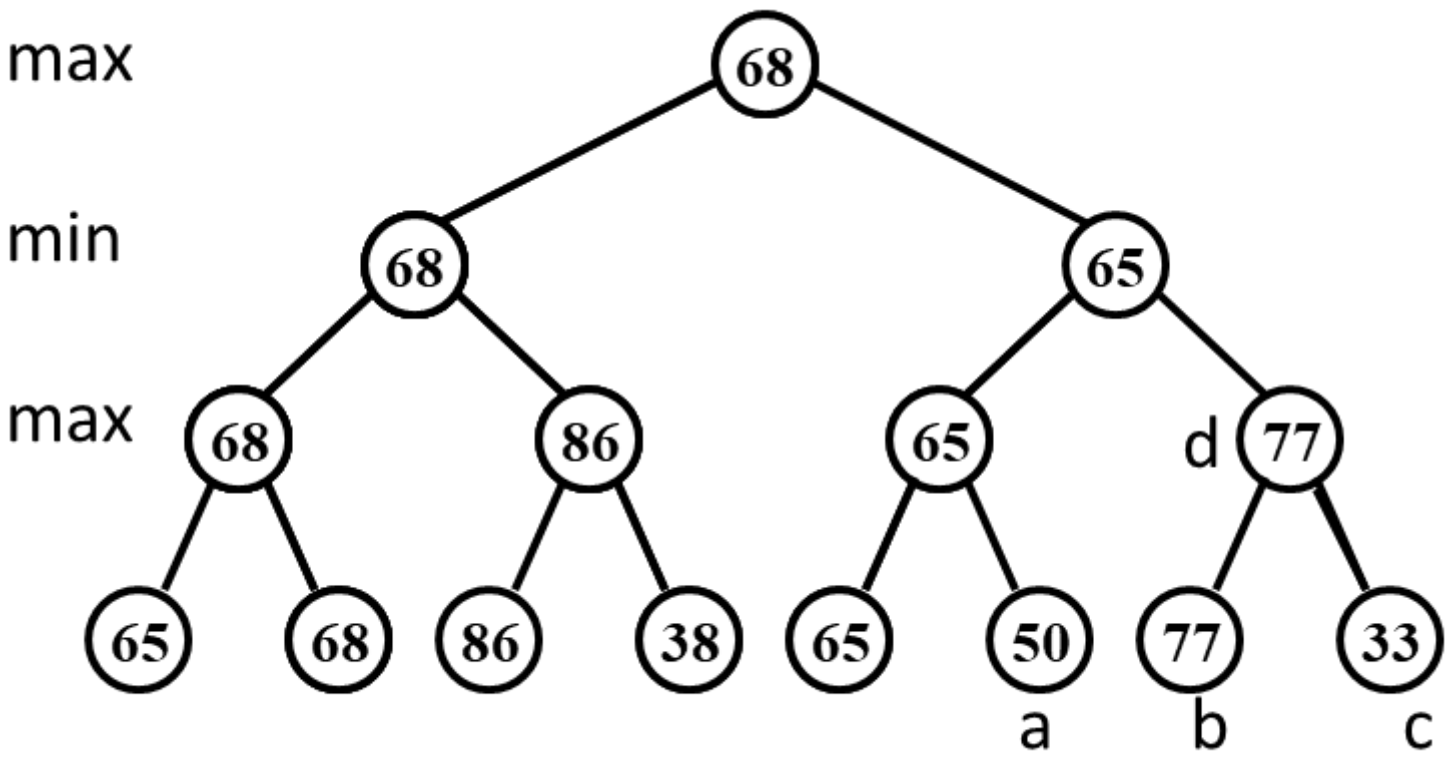

- A. a
- B. b
- C. c
- D. d

2-8 答案错误 (0 分) 创建提问

2-9 There are 8000 documents in the database. The statistic data for one query are shown in the following table. The precision is: __ (5分)

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	Relevant	Irrelevant

	Relevant	Irrelevant
Retrieved	1000	1000
Not Retrieved	2000	4000

- A. 12.5%
- B. 20%
- C. 33%
- D. 50%

2-9 答案正确 (5 分) 创建提问

2-10 Insert key 48 into the balanced binary tree shown by the figure. Then in the resulting balanced tree, the left- and right-child of key 37 are: (5分)

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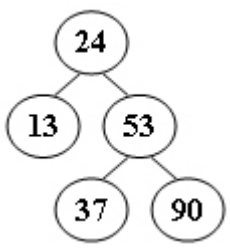

- A. 13 and 48
- B. 24 and 48
- C. 24 and 53
- D. 24 and 90

2-10 答案正确 (5 分) 创建提问

2-11 After inserting 1 into the red-black tree given in the figure, which node(s) will keep its/their color(s) unchanged? (3分)

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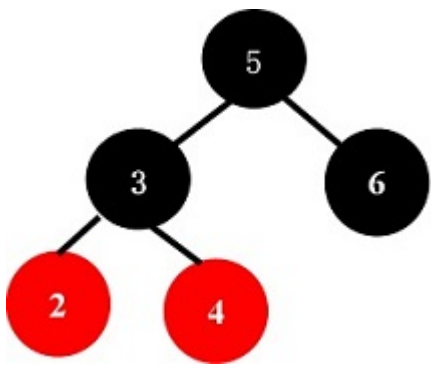
- A. both 3 and 6
- B. both 5 and 6
- C. 3, 5, and 6
- D. 3, 4, 5, and 6



2-11 答案正确 (3 分) 创建提问