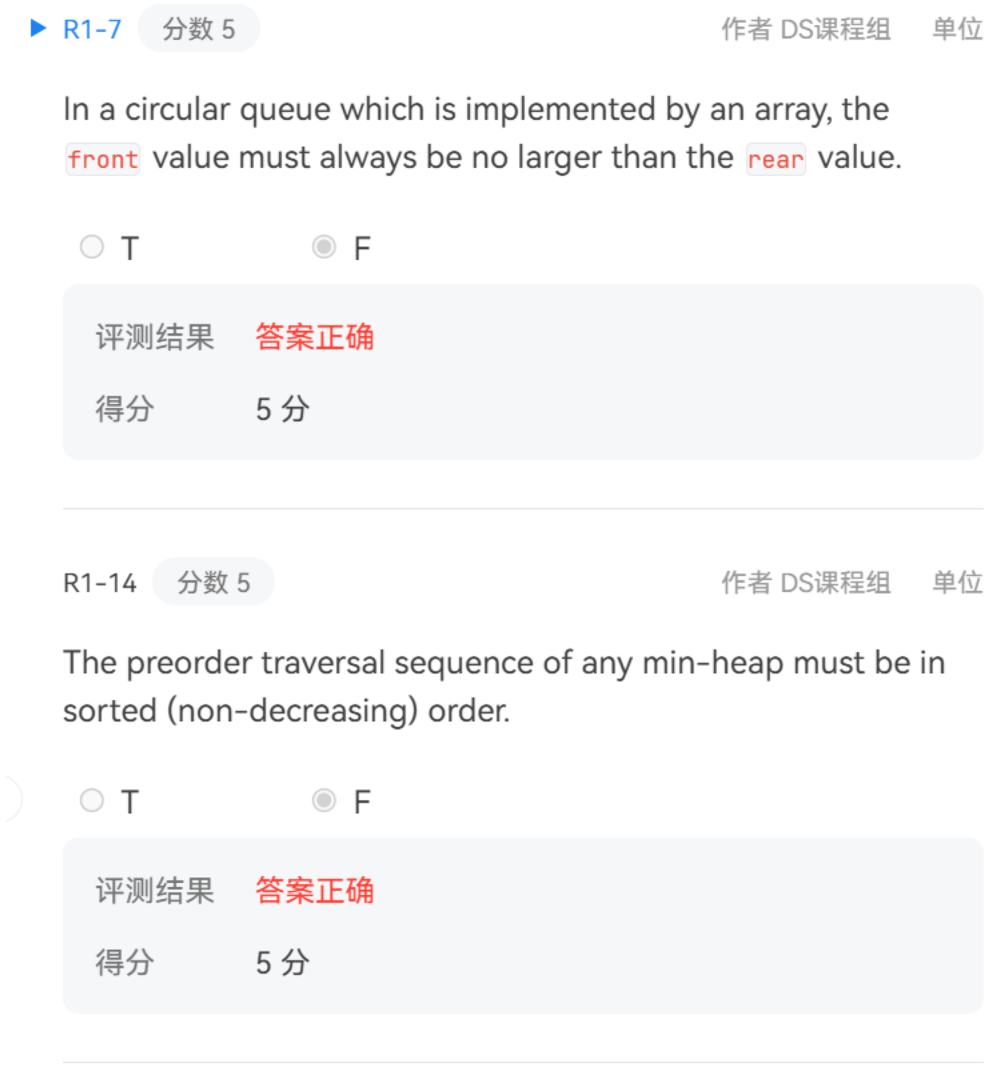


▶ R1-7 分数 5 作者 DS课程组 单位

In a circular queue which is implemented by an array, the `front` value must always be no larger than the `rear` value.

○ T ● F

评测结果 答案正确

得分 5 分

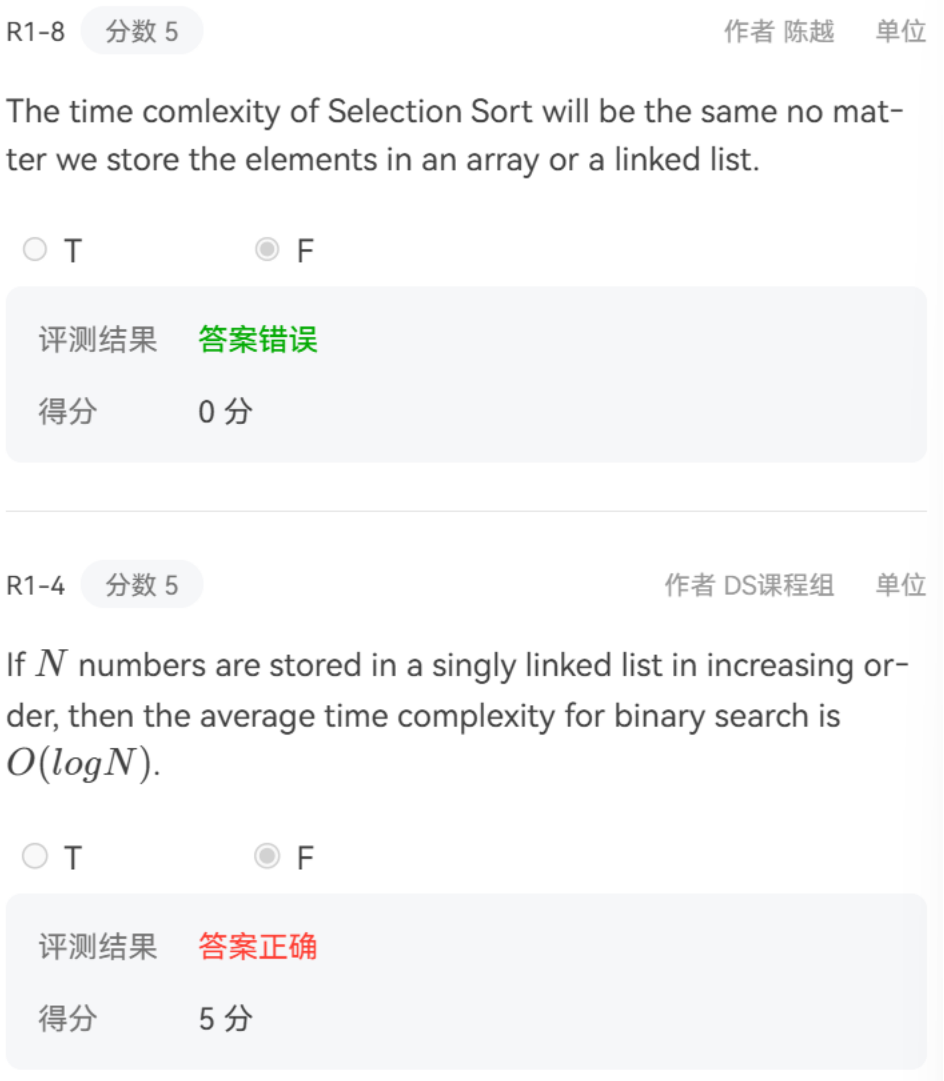
R1-14 分数 5 作者 DS课程组 单位

The preorder traversal sequence of any min-heap must be in sorted (non-decreasing) order.

○ T ● F

评测结果 答案正确

得分 5 分



R1-8 分数 5 作者 陈越 单位

The time comlexity of Selection Sort will be the same no matter we store the elements in an array or a linked list.

○ T ● F

评测结果 答案错误

得分 0 分

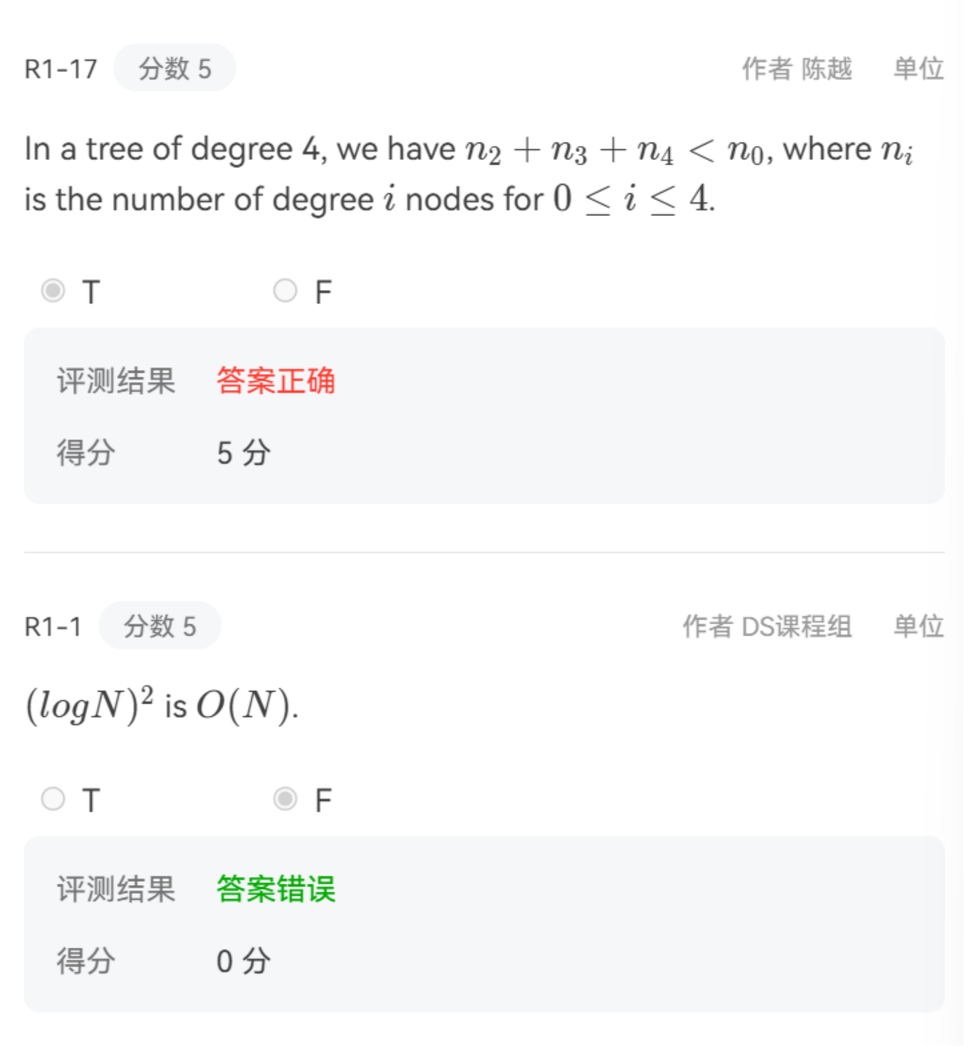
R1-4 分数 5 作者 DS课程组 单位

If N numbers are stored in a singly linked list in increasing order, then the average time complexity for binary search is $O(logN)$.

○ T ● F

评测结果 答案正确

得分 5 分



R1-17 分数 5 作者 陈越 单位

In a tree of degree 4, we have $n_2 + n_3 + n_4 < n_0$, where n_i is the number of degree i nodes for $0 \leq i \leq 4$.

● T ○ F

评测结果 答案正确

得分 5 分

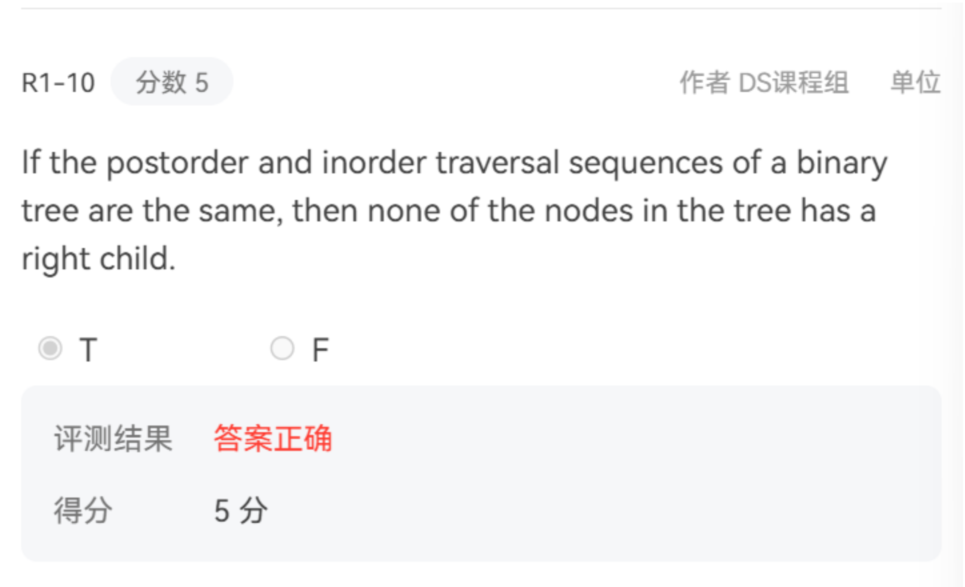
R1-1 分数 5 作者 DS课程组 单位

$(logN)^2$ is $O(N)$.

○ T ● F

评测结果 答案错误

得分 0 分



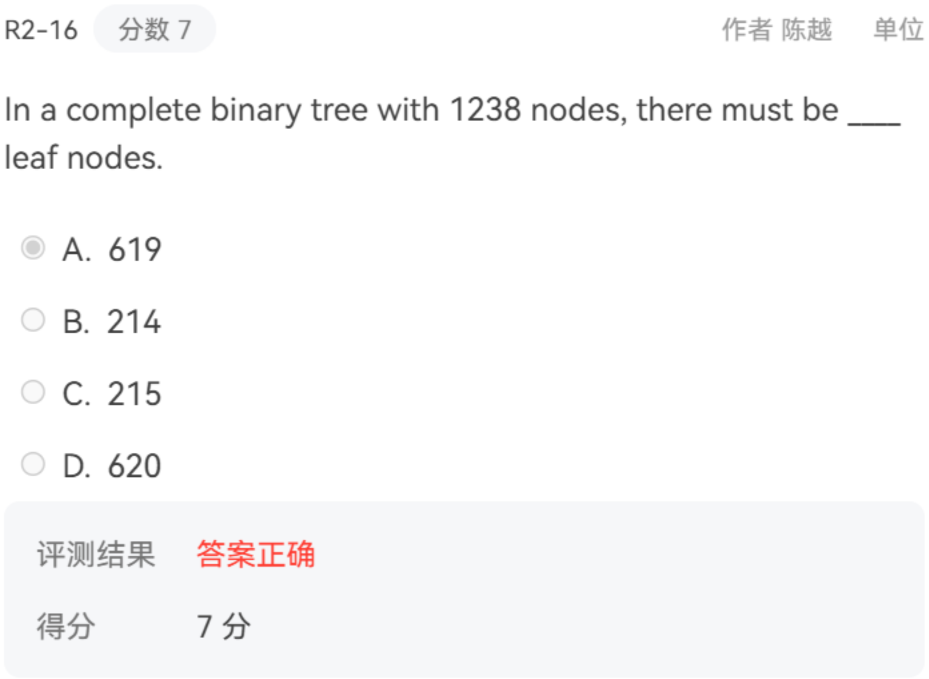
R1-10 分数 5 作者 DS课程组 单位

If the postorder and inorder traversal sequences of a binary tree are the same, then none of the nodes in the tree has a right child.

● T ○ F

评测结果 答案正确

得分 5 分



R2-16 分数 7 作者 陈越 单位

In a complete binary tree with 1238 nodes, there must be ___ leaf nodes.

● A. 619

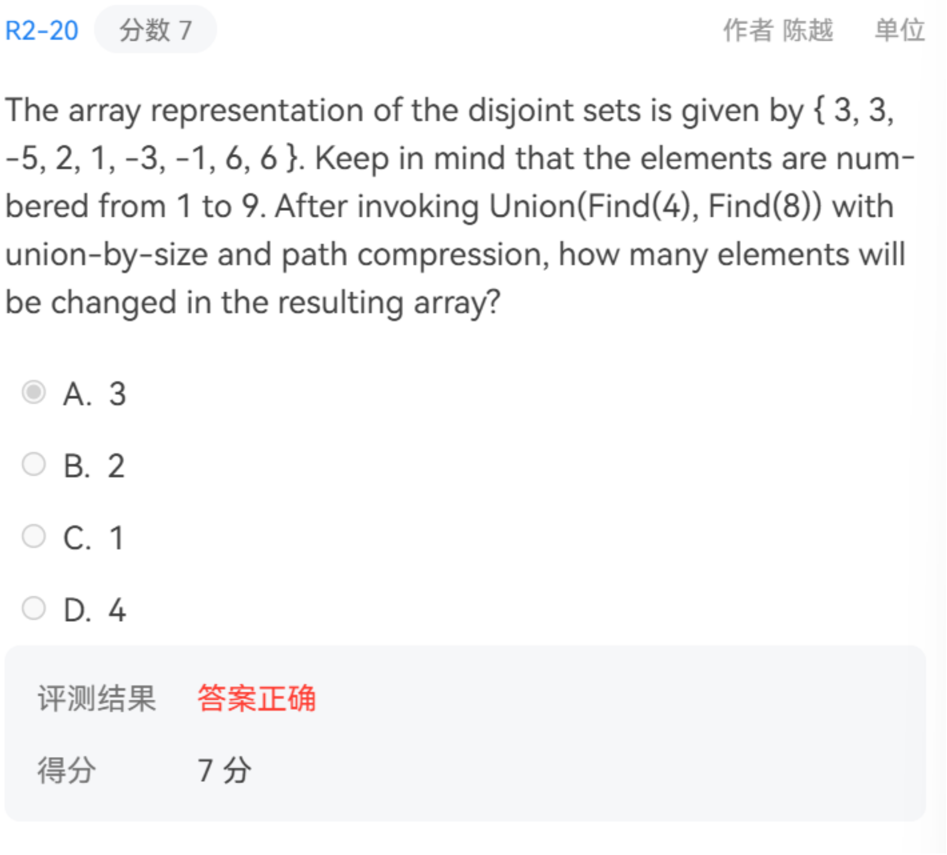
○ B. 214

○ C. 215

○ D. 620

评测结果 答案正确

得分 7 分



R2-20 分数 7 作者 陈越 单位

The array representation of the disjoint sets is given by { 3, 3, -5, 2, 1, -3, -1, 6, 6 }. Keep in mind that the elements are numbered from 1 to 9. After invoking Union(Find(4), Find(8)) with union-by-size and path compression, how many elements will be changed in the resulting array?

● A. 3

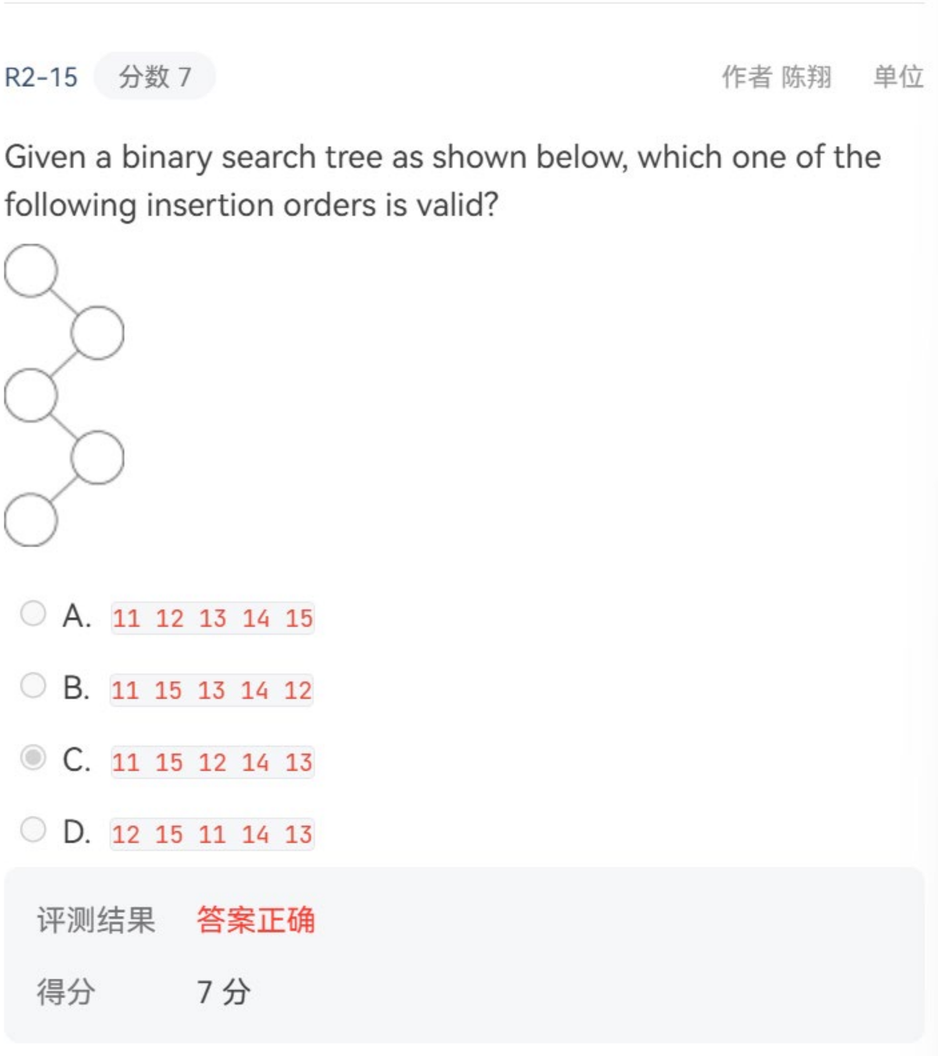
○ B. 2

○ C. 1

○ D. 4

评测结果 答案正确

得分 7 分



R2-15 分数 7 作者 陈翔 单位

Given a binary search tree as shown below, which one of the following insertion orders is valid?

○ A. `11 12 13 14 15`

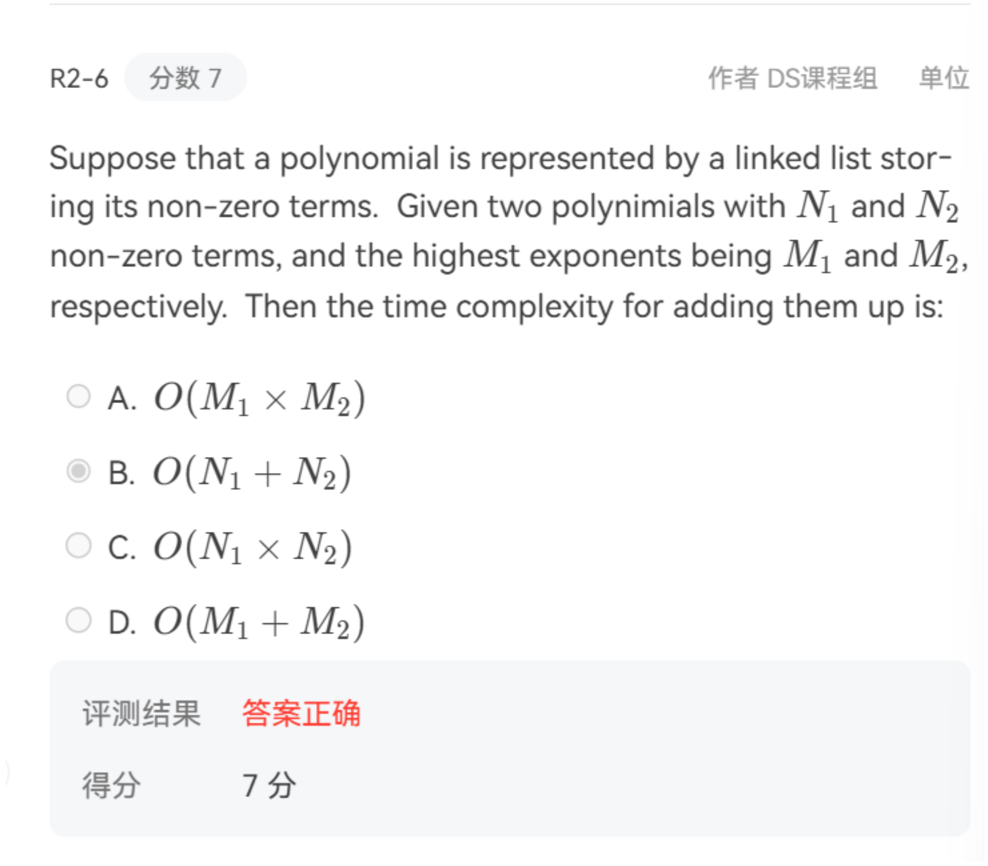
○ B. `11 15 13 14 12`

● C. `11 15 12 14 13`

○ D. `12 15 11 14 13`

评测结果 答案正确

得分 7 分



R2-6 分数 7 作者 DS课程组 单位

Suppose that a polynomial is represented by a linked list storing its non-zero terms. Given two polynimials with N_1 and N_2 non-zero terms, and the highest exponents being M_1 and M_2, respectively. Then the time complexity for adding them up is:

○ A. $O(M_1 \times M_2)$

● B. $O(N_1 + N_2)$

○ C. $O(N_1 \times N_2)$

○ D. $O(M_1 + M_2)$

评测结果 答案正确

得分 7 分

R2-32 分数 7 作者 陈越 单位

A "full tree" of degree 3 (every non-leaf node has 3 children) has 61 nodes. Then its height h is at most ___. Note: $h = 0$ for a single node tree.

○ A. cannot be determined ○ B. 19 ○ C. 21 ● D. 20

评测结果 答案正确

得分 7 分

R2-9 分数 7 作者 DS课程组 单位

If a stack is used to convert the infix expression `a+b*c+(d*e+f)*g` into a postfix expression, what will be in the stack (listing from the bottom up) when `f` is read?

○ A. +(+

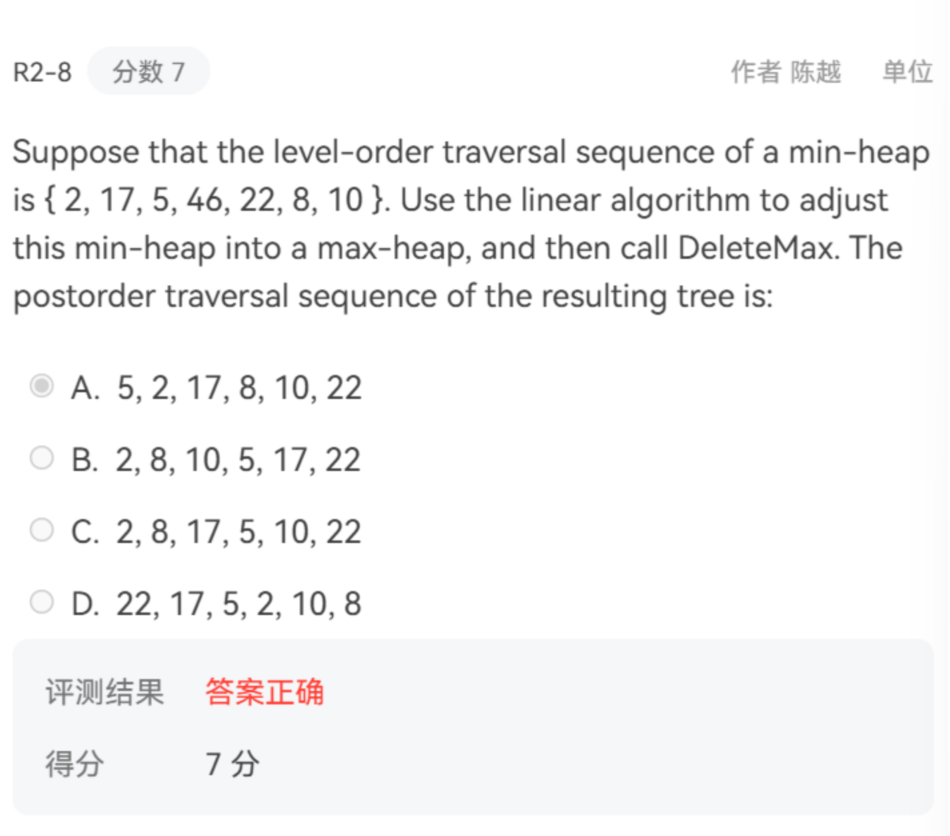
○ B. +(*+

● C. ++(+

○ D. abcde

评测结果 答案错误

得分 0 分



R2-8 分数 7 作者 陈越 单位

Suppose that the level-order traversal sequence of a min-heap is { 2, 17, 5, 46, 22, 8, 10 }. Use the linear algorithm to adjust this min-heap into a max-heap, and then call DeleteMax. The postorder traversal sequence of the resulting tree is:

● A. 5, 2, 17, 8, 10, 22

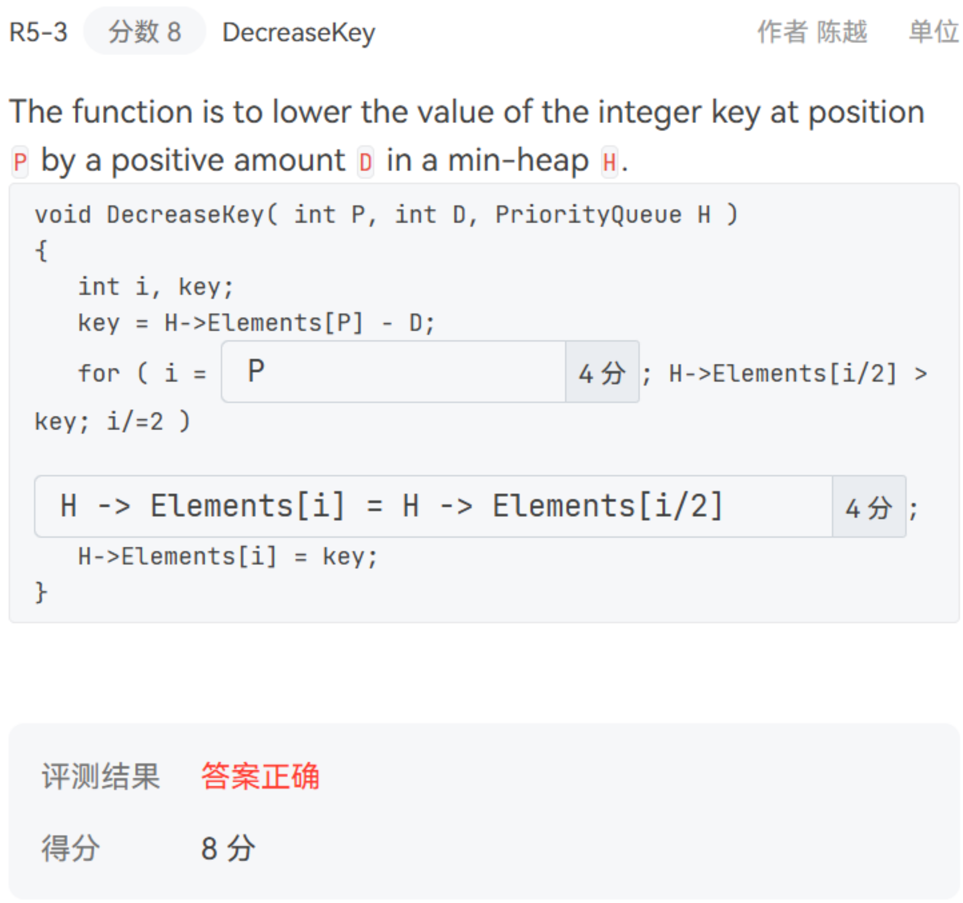
○ B. 2, 8, 10, 5, 17, 22

○ C. 2, 8, 17, 5, 10, 22

○ D. 22, 17, 5, 2, 10, 8

评测结果 答案正确

得分 7 分



R5-3 分数 8 DecreaseKey 作者 陈越 单位

The function is to lower the value of the integer key at position `P` by a positive amount `D` in a min-heap `H`.

```
void DecreaseKey( int P, int D, PriorityQueue H )
{
   int i, key;
   key = H->Elements[P] - D;
   for ( i = [ P ] 4分 ; H->Elements[i/2] > key; i/=2 )
      [ H -> Elements[i] = H -> Elements[i/2] ] 4分 ;
   H->Elements[i] = key;
}
```

评测结果 答案正确

得分 8 分

R6-3 Build Tree from Post- and In-order Sequences 分数 8

全屏浏览　切换布局　　　作者 DS课程组　单位 浙江大学

You are supposed to write a function of constructing a binary tree with given postorder and inorder sequences.

Format of function:

```
Tree BuildTree( int inorder[], int postorder[], int N );
```

where `Tree` is defined as the following:

```
typedef struct TreeNode *Tree;
struct TreeNode {
    int Element;
    Tree  Left;
    Tree  Right;
};
```

The inorder and postorder sequences are stored in `int inorder[]` and `int postorder[]`, respectively. The integer `N` is the number of nodes in the tree. The function `BuildTree` is supposed to return the pointer to the root of the constructed tree.

Sample program of judge:

```c
#include <stdio.h>
#include <stdlib.h>

#define MAXN 10

typedef struct TreeNode *Tree;
struct TreeNode {
    int Element;
    Tree  Left;
    Tree  Right;
};

Tree BuildTree( int inorder[], int postorder[], int N );

void Inorder_output( Tree T ); /* details omitted */
void Postorder_output( Tree T ); /* details omitted */

int main()
{
    Tree T;
    int inorder[MAXN], postorder[MAXN], N, i;

    scanf("%d", &N);
    for (i=0; i<N; i++) scanf("%d", &inorder[i]);
    for (i=0; i<N; i++) scanf("%d", &postorder[i]);
    T = BuildTree(inorder, postorder, N);
    printf("Check:\n");
    Inorder_output(T);   printf("\n");
    Postorder_output(T); printf("\n");

    return 0;
}

/* Your function will be put here */
```

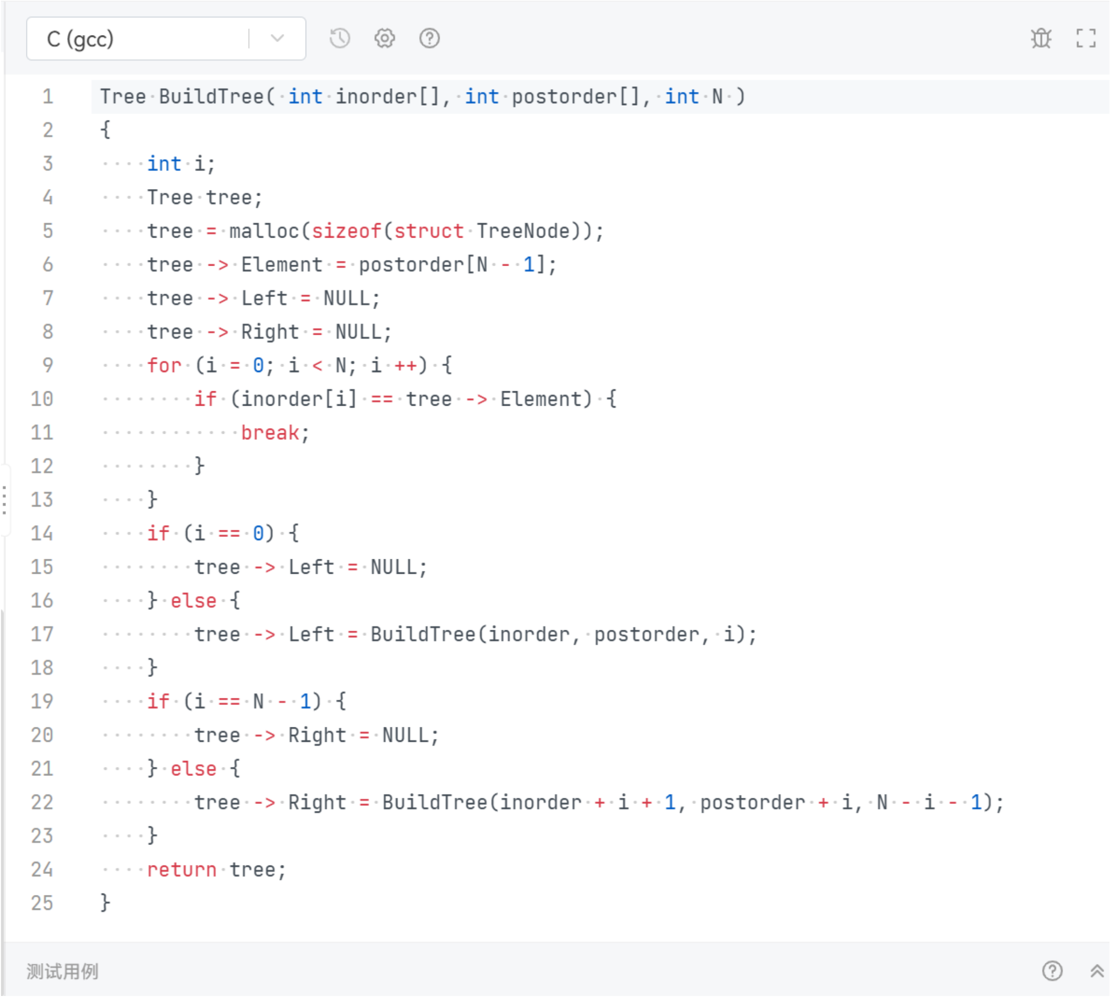
Sample Input:

```
7
1 2 3 4 5 6 7
2 3 1 5 7 6 4
```

Sample Output:

```
Check:
1 2 3 4 5 6 7
2 3 1 5 7 6 4
```

代码长度限制	16 KB
时间限制	400 ms
内存限制	64 MB



```c
Tree BuildTree( int inorder[], int postorder[], int N )
{
    int i;
    Tree tree;
    tree = malloc(sizeof(struct TreeNode));
    tree -> Element = postorder[N - 1];
    tree -> Left = NULL;
    tree -> Right = NULL;
    for (i = 0; i < N; i ++) {
        if (inorder[i] == tree -> Element) {
            break;
        }
    }
    if (i == 0) {
        tree -> Left = NULL;
    } else {
        tree -> Left = BuildTree(inorder, postorder, i);
    }
    if (i == N - 1) {
        tree -> Right = NULL;
    } else {
        tree -> Right = BuildTree(inorder + i + 1, postorder + i, N - i - 1);
    }
    return tree;
}
```