

3. The purpose of the algorithm analysis is (), and the two main aspects of the algorithm analysis are ().

- A. The rationality of data structure is given.
- B. The relationship between input and output in the research.
- C. To improve the efficiency of the algorithm.
- D. Analysis of the algorithm's understanding and documentation.
- E. Space complexity and time complexity.
- F. Correctness and simplicity.

5. Using the linked list structure to store the linear list, the address of the memory for the nodes ().

- A. Must be continuous
- B. Part of the address must be continuous.
- C. Must be discontinuous
- D. Can be continuous or discontinuous.

6. The stack ST is represented by a sequential storage structure, what is the condition that ST is empty? ()

- A. $ST.top - ST.base < 0$
- B. $ST.top - St.base = 0$
- C. $ST.top - ST.base < n$
- D. $ST.top - ST.base < n$

9. Tree structure is the most suitable to express ().

- A. Sequence data element.
- B. Data that has a hierarchical relationship between elements.
- C. Disorderly data element.
- D. No link between elements.

10. A full binary tree, M is the number of leaf nodes, N is the number of all nodes, H is the depth of the tree, then ().

- A. $N = H + M$
- B. $H + M = 2N$
- C. $M = H - 1$
- D. $N = 2^H - 1$

11. There is a binary tree, if the preorder sequence of the tree is same as the postorder sequence of the tree, then what is the possible shape of the binary tree? ().

- A. There is no node whose node degree is 2.
- B. There is only one root node in the tree.

2. The number of elements in the list is N , when inserting an element to the list or deleting an element from the list, the number of average moving elements will be _____, the number of

moving element is related with _____.

3. What are the different points of the stack and queue? The main feature of stack is _____, and the main feature of queue is _____.

5. In a binary tree, the number of node degree 0 is N_0 , the number of node degree 2 is N_2 , then $N_0 = \underline{\hspace{2cm}}$.

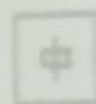
III、 Simple Answer following questions (34 points).

1. (2 points) What kind of memory structure should be used when you need to insert and delete the elements from the linear list more frequently? Why?

2. (4 points) Briefly describes the functionality of following algorithm(the data type of each element is int)

北京邮电大学软件学院 2016 级本科生

《算法与数据结构》期中考试答案



一、多选题 (24 分, 每小题 2 分)

1. D 2. BH 3. CE 4. B 5. D 6. B 7. B 8. A 9. B 10. D 11. B
12. B

二、填空(10 分, 每小题 2 分)

1. $O(m*n)$ 2. 表中一半; 该元素的位置 3. 先进后出; 先进先出
4. 'structure' 5. N^2+1

三、简答(32 分)

1. 采用链式存储结构, 链式存储插入、删除时间复杂度为 $O(1)$, 而线性时间复杂度为 O

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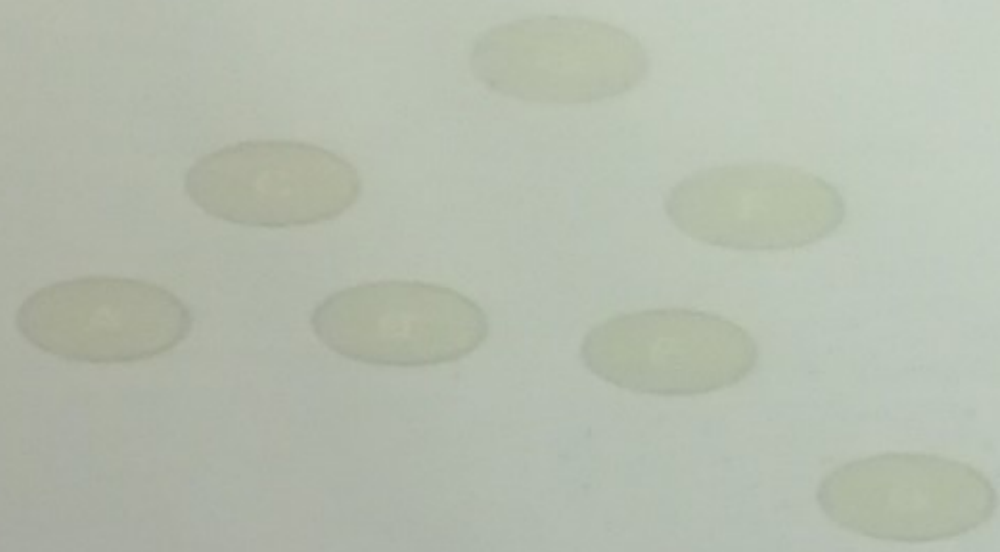
1. $O(m \cdot n)$ 2. 表中一半; 该元素的位置 3. 先进后出; 先进先出
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三、简答 (32 分)

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1. 采用链式存储结构, 链式非循环插入, 删除时间复杂度为 $O(1)$, 而线性时间复杂度为 $O(n)$. (2 分)
2. 利用栈 S 将数组 A 中的元素逆置. (4 分).
3. 求链表的倒数第 k 个元素的值 (5 分).
4. (5 分).
 - 1) $s \rightarrow next = p \rightarrow next; p \rightarrow next \rightarrow prior = s;$
 - 2) 双链表中插入一个元素.
5. (8 分).

I



三. 简答(32 分)

1. 采用链式存储结构, 链式存储插入、删除时间复杂度为 $O(1)$, 而线性时间复杂度为 $O(n)$. (2 分).
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