



A. 单选题 4

2-1 When solving a problem with input size N by divide and conquer, if at each stage the problem is divided into 8 sub-problems of equal size $N/3$, and the conquer step takes $O(N^2 \log N)$ to form the solution from the sub-solutions, then the overall time complexity is __. (2分)

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单位

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- ☒ A. $O(N^2 \log N)$
- ☐ B. $O(N^2 \log^2 N)$
- ☐ C. $O(N^3 \log N)$
- ☐ D. $O(N^{\log 8 / \log 3})$

2-1 答案正确 (2 分) 创建提问

2-2 To solve a problem with input size N by divide and conquer algorithm, among the following methods, __ is the worst. (2分)

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- ☐ A. divide into 2 sub-problems of equal complexity $N/3$ and conquer in $O(N)$
- ☐ B. divide into 2 sub-problems of equal complexity $N/3$ and conquer in $O(N \log N)$
- ☒ C. divide into 3 sub-problems of equal complexity $N/2$ and conquer in $O(N)$
- ☐ D. divide into 3 sub-problems of equal complexity $N/3$ and conquer in $O(N \log N)$

N
NlogN
N^log3
NlogNlogN

2-2 答案正确 (2 分) 创建提问

2-3 3-way-mergesort : Suppose instead of dividing in two halves at each step of the mergesort, we divide into three one thirds, sort each part, and finally combine all of them using a three-way-merge. What is the overall time complexity of this algorithm ? (2分)

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- ☐ A. $O(n(\log^2 n))$
- ☐ B. $O(n^2 \log n)$
- ☒ C. $O(n \log n)$
- ☐ D. $O(n)$

2-3 答案正确 (2 分) 创建提问

2-4 Which one of the following is the lowest upper bound of $T(n)$ for the following recursion $T(n) = 2T(\sqrt{n}) + \log n$? (4分)

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- ☒ A. $O(\log n \log \log n)$
- ☐ B. $O(\log^2 n)$
- ☐ C. $O(n \log n)$
- ☐ D. $O(n^2)$

2-4 答案正确 (4 分) 创建提问