Interview Questions: Mergesort

Help Center

Warning: The hard deadline has passed. You can attempt it, but **you will not get credit for it**. You are welcome to try it as a learning exercise.

These interview questions are for your own enrichment and are not assessed. If you click the *Submit Answers* button, you will get a hint.

☐ **In accordance with the Coursera Honor Code, I (David Resnick) certify that the answers here are my own work.**

Question 1

Merging with smaller auxiliary array. Suppose that the subarray `a[0]` to `a[N-1]` is sorted and the subarray `a[N]` to `a[2*N-1]` is sorted. How can you merge the two subarrays so that `a[0]` to `a[2*N-1]` is sorted using an auxiliary array of size N (instead of $2N$)?

Question 2

Counting inversions. An *inversion* in an array $a[\,]$ is a pair of entries $a[i]$ and $a[j]$ such that $i < j$ but $a[i] > a[j]$. Given an array, design a linearithmic algorithm to count the number of inversions.

Question 3

Shuffling a linked list. Given a singly-linked list containing N items, rearrange the items uniformly at random. Your algorithm should consume a logarithmic (or constant) amount of extra memory and run in time proportional to $N \log N$ in the worst case.

☐ **In accordance with the Coursera Honor Code, I (David Resnick) certify that the answers here are my own work.**

Submit Answers Save Answers

You cannot submit your work until you agree to the Honor Code. Thanks!