Practice Quiz, 3 questions

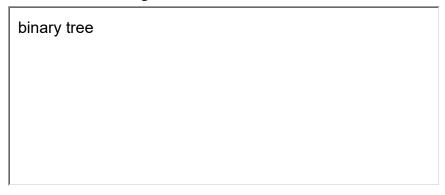


1/1 points

1

Dynamic median. Design a data type that supports insert in logarithmic time, find-the-median in constant time, and remove-the-median in logarithmic time.

Note: these interview questions are ungraded and purely for your own enrichment. To get a hint, submit a solution.



Your answer cannot be more than 10000 characters.

Thank you for your response.

Hint: maintain *two* binary heaps, one that is max-oriented and one that is min-oriented.



1/1 points

2

Randomized priority queue. Describe how to add the methods sample() and delRandom() to our binary heap implementation. The two methods return a key that is chosen uniformly at random among the remaining keys, with the latter

method also removing that key. The **sample()** method should take constant time; the **delRandom()** method should take

Interview Questiones in Priority Questos (stanguadade) lying 3/3 points (100%)

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priority queue			

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1/1 points

3.

Taxicab numbers. A *taxicab* number is an integer that can be expressed as the sum of two cubes of positive integers in two different ways: $a^3+b^3=c^3+d^3$. For example, 1729 is the smallest taxicab number: $9^3+10^3=1^3+12^3$. Design an algorithm to find all taxicab numbers less than n.

- Version 1: Use time proportional to $n^2 \log n$ and space proportional to n^2 .
- Version 2: Use time proportional to $n^2 \log n$ and space proportional to n .

no idea

Interview Questions: Priority Queues (ungraded)

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3/3 points (100%)

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Thank you for your response.

Hints:

- Version 1: Form the sums a^3+b^3 and sort.
- ullet Version 2: Use a min-oriented priority queue with n items.

