

Lecture_3

1. ~~Finding the median requires sorting the array~~ and then using the $\frac{(n+1)}{2}$ th element or mean of n & $\frac{(n+1)}{2}$ th element. Sorting an array can solve median therefore it is just as hard or harder.



You can find the median by sorting the array and then using the $\frac{(n+1)}{2}$ th element or mean of n & $\frac{(n+1)}{2}$ th element. Sorting an array can solve median therefore it is just as hard or harder.

2. In order to find the median of an (unsorted) array of numbers, one ~~must~~ first sort the provided array before then retrieving the element in the middle of the array. After sorting, retrieving this element should take constant time.



In order to find the median of an (unsorted) array of numbers, **one can first sort the provided array** before then retrieving the element in the middle of the array. After sorting, retrieving this element should take constant time.

3. The solution A of sorting an array of numbers can be used by the solution B to find a median of numbers by using solution A and then getting the median using an index which is $\Theta(1)$ time. Since solution B can use solution A, then problem A must be just as hard or possibly harder than problem B.



4. Sorting an array means traversing all the elements of the array and comparing with each other. Median of an array of elements can be found out by sorting half the elements of the array and print the middle element.



Because it could be the second half.

5. Sorting an array produces an ordered array of numbers with a known length. To determine the median is a constant calculation in a sorted array, and is within $\Theta(1)$ of sorting the array, you either take the value in the middle of the sorted array with odd length, or the average of the two values in the values in the middle of an array with even length.



6. Sorting an array be Problem A and finding the median of an array be Problem B: Problem A is just as hard or possibly harder than solving Problem B since the median of a sorted array is its middle element. So if we solve Problem A then Problem B will be solved. Which is why it is just as hard or possibly harder than solving Problem B.



7. Suppose we have a solution S for sorting problem. Finding a median number is like sorting only half the array and take the middle one as a result, or sorting the whole array and take the middle one. Therefore it takes only half time compare to sorting an array because it only needs to use half of solution of S. This makes sorting an array as hard or possibly harder.



8. Because the solution which can solve the problem of sorting an array of numbers can also solve the problem of finding a median of an array of numbers.



9. Both require iterating over all array elements. In order to find the median of the array you have to see all elements in the array. All elements must be iterated over to check if an array is sorted. Therefore, sorting an array is as hard as finding a median of an array of numbers.



10. The solution can solve the problem of sorting an array of numbers can also solve the problem of finding a median of an array of numbers.



11. Problem of sorting an array of numbers is just as hard or possibly harder than problem of finding a median would just make the array sorted and then divide the number of elements in the array by 2.



finding a median of the array, it doesn't make the array sorted.

12. Finding the median number from an array requires to know the "ranking" of the number size which is essentially sorting an array and it is the minimum operation to find the median, so it is just as hard or possibly harder.



13. You can sort the array and find the median in $O(1)$ by looking at index $\frac{n}{2}$



14. You must sort the array (or part of the array) to find the median.



15. Sorting an array requires at least one loop through the array to get through the array and finding the median of an array of numbers may take at least half of the number of iterations.



16. Sorting an array requires running through each number and placing it in order. The same process must be done in order to find the median value, or in other words, you need to sort the array to find the median, therefore the problems are just as hard as each other.

