Coding Interview Questions

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- This series of practice questions tests your knowledge on a few popular coding questions.
- These questions don’t rely on knowledge of statistics or machine learning, but focus instead on solving problems with code.

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- Depending on the company's experience with hiring data scientists, the interview could potentially focus heavily on these types of questions!
- You can study Data Structures and Algorithms for more preparation!

Let’s get started!

Coding Interview Question 1

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- Given an array of integers (positive and negative) write a program that can find the largest continuous sum.
- You just need to return the total sum amount, not the sequence.
- Let’s see a few clarifying examples.

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- [7,8,9] answer is: 7+8+9 =24
- [-1,7,8,9,-10] answer is: 7+8+9=24
- [2,3,-10,9,2] answer is 9+2=11
- [2,11,-10,9,2] answer is 2+11-10+9+2=14
- [12,-10,7,-8,4,6] answer is 12

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- Best of luck!

Coding Interview Question 2

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- Given a string in the form 'AAAABBBBBCCCCCDDEEEE' compress it to become 'A4B4C5D2E4'.
- For this problem, you can falsely "compress" strings of single or double letters.

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- For instance, it is okay for 'AAB' to return 'A2B1' even though this technically takes more space.
- The function should also be case sensitive, so that a string 'AAAaaa' returns 'A3a3'.

Coding Interview Question 3

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- You are given an array of historical stock prices per day, for example:
    - [6 ,13 , 2, 10 , 3, 5]
- Write an algorithm that figures out what days (index of array) you could buy and sell the stock for maximum profit.

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- You are only allowed to buy the stock once and sell it once.
- Also no shorting the stock, you have to buy before selling
- Let’s walk through an example of this with the example array of stock prices.

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- Given:
  - [6 ,13 , 2, 10 , 3, 5]
- You make the most profit by buying on day 3 (price of $2) and selling on day 4 (price of $10), netting you an $8 gain.

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- Hint:
    - You should be able to solve this problem by only going through the array once!

Coding Interview Question 4

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- Consider an array of non-negative integers.
- A second array is formed by shuffling the elements of the first array and deleting a random element. Given these two arrays, find which element is missing in the second array.

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- For example, given:
  - [1,2,3,4,5]
  - [1,3,4,5]
- The missing value was 2
- Try to solve this problem in multiple ways!

SOLUTIONS

SOLUTIONS ARE UP NEXT!

Solution to Coding Interview Question 1

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- Given an array of integers (positive and negative) write a program that can find the largest continuous sum.
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- [7,8,9] answer is: 7+8+9 =24
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- [12,-10,7,-8,4,6] answer is 12

- The algorithm is, we start summing up the numbers and store in a current sum variable.
- After adding each element, we check whether the current sum is larger than maximum sum encountered so far.

- If it is, we update the maximum sum.
- As long as the current sum is positive, we keep adding the numbers.
- When the current sum becomes negative, we start with a new current sum.

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- Because a negative current sum will only decrease the sum of a future sequence.
- Note that we don’t reset the current sum to 0 because the array can contain all negative integers.
- Then the result would be the largest negative number.

Solution to Coding Interview Question 2

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- For instance, it is okay for 'AAB' to return 'A2B1' even though this technically takes more space.
- The function should also be case sensitive, so that a string 'AAAaaa' returns 'A3a3'.

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- Our strategy will be to go along the string, keeping a running count of the current letter series.
- Once we detect a change in letter, we “compress” that series with its count.
- Let’s code this out!

Solution to Coding Interview Question 3

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- We'll start by coding a base solution and then move on to fix some possible edge cases.
- Let's discuss strategy...

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One thing to think about right off the bat is that we can't just find the maximum price and the lowest price and then subtract the two, because the max could come before the min.

The brute force method would be to try every possible pair of price combinations, but this would be O(N^2), pretty bad. Also since this is an interview setting you should probably already know that there is a smarter solution.

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In this case we will use a greedy algorithm approach.

We will iterate through the list of stock prices while keeping track of our maximum profit.

That means for every price we will keep track of the lowest price so far and then check if we can get a better profit than our current max.

Let’s get started!

Solution to Coding Interview Question 4

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- Consider an array of non-negative integers.
- A second array is formed by shuffling the elements of the first array and deleting a random element. Given these two arrays, find which element is missing in the second array.

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- For example, given:
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  - [1,3,4,5]
- The missing value was 2
- Try to solve this problem in multiple ways!

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- There are many possible solutions for this problem!
- We'll show you two straight forward approaches.

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- Since we know all the numbers are non-negative, we can simply sum up both arrays, check the difference, and you have your missing element.

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- Another approach is to sort both arrays, and then just go through them sequentially until you don’t have a match!
- Let’s code these solutions out.