

Grokking the Coding Interview: Patterns for Coding Questions

50% completed



- Find the Duplicate Number (easy)
- Find all Duplicate Numbers (easy)
- Problem Challenge 1
- Solution Review: Problem Challenge 1**
- Problem Challenge 2
- Solution Review: Problem Challenge 2
- Problem Challenge 3
- Solution Review: Problem Challenge 3

Pattern: In-place Reversal of a LinkedList

- Introduction
- Reverse a LinkedList (easy)
- Reverse a Sub-list (medium)
- Reverse every K-element Sub-list (medium)
- Problem Challenge 1
- Solution Review: Problem Challenge 1
- Problem Challenge 2
- Solution Review: Problem Challenge 2

Pattern: Tree Breadth First Search

- Introduction
- Binary Tree Level Order Traversal (easy)
- Reverse Level Order Traversal (easy)
- Zigzag Traversal (medium)
- Level Averages in a Binary Tree (easy)
- Minimum Depth of a Binary Tree (easy)
- Level Order Successor (easy)
- Connect Level Order Siblings (medium)
- Problem Challenge 1
- Solution Review: Problem Challenge 1
- Problem Challenge 2
- Solution Review: Problem Challenge 2

Pattern: Tree Depth First Search

- Introduction
- Binary Tree Path Sum (easy)
- All Paths for a Sum (medium)
- Sum of Path Numbers (medium)
- Path With Given Sequence (medium)
- Count Paths for a Sum (medium)
- Problem Challenge 1
- Solution Review: Problem Challenge 1
- Problem Challenge 2
- Solution Review: Problem Challenge 2

Solution Review: Problem Challenge 1

We'll cover the following

- Find the Corrupt Pair (easy)
- Solution
- Code
 - Time complexity
 - Space complexity

Find the Corrupt Pair (easy)

We are given an unsorted array containing 'n' numbers taken from the range 1 to 'n'. The array originally contained all the numbers from 1 to 'n', but due to a data error, one of the numbers got duplicated which also resulted in one number going missing. Find both these numbers.

Example 1:

```
Input: [3, 1, 2, 5, 2]
Output: [2, 4]
Explanation: '2' is duplicated and '4' is missing.
```

Example 2:

```
Input: [3, 1, 2, 3, 6, 4]
Output: [3, 5]
Explanation: '3' is duplicated and '5' is missing.
```

Solution

This problem follows the **Cyclic Sort** pattern and shares similarities with [Find all Duplicate Numbers](#). Following a similar approach, we will place each number at its correct index. Once we are done with the cyclic sort, we will iterate through the array to find the number that is not at the correct index. Since only one number got corrupted, the number at the wrong index is the duplicated number and the index itself represents the missing number.

Code

Here is what our algorithm will look like:

JavaPython3C++JS

```
1 function find_corrupt_numbers(nums) {
2   let i = 0;
3   while (i < nums.length) {
4     const j = nums[i] - 1;
5     if (nums[i] !== nums[j]) {
6       [nums[i], nums[j]] = [nums[j], nums[i]]; // swap
7     } else {
8       i += 1;
9     }
10  }
11  for (i = 0; i < nums.length; i++) {
12    if (nums[i] !== i + 1) {
13      return [nums[i], i + 1];
14    }
15  }
16  return [-1, -1];
17 }
18
19
20 console.log(find_corrupt_numbers([3, 1, 2, 5, 2]));
21 console.log(find_corrupt_numbers([3, 1, 2, 3, 6, 4]));
```

RUN

SAVE

RESET

Close

Output2.221s

[2, 4]

[3, 5]

Time complexity

The time complexity of the above algorithm is $O(n)$.

Space complexity

The algorithm runs in constant space $O(1)$.

Challenge 2

Pattern: Two Heaps ^

Introduction

Find the Median of a Number Stream (medium)

Sliding Window Median (hard)

Maximize Capital (hard)

Problem Challenge 1

Solution Review: Problem Challenge 1

Pattern: Subsets ^

Introduction

Subsets (easy)

Subsets With Duplicates (easy)

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Problem Challenge 1

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Problem Challenge 2

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