

ACM Fall 2021

CSIP 13



Introduction



Welcome!







Welcome to Association for Computing Machinery @ UGA

TOP THINGS TO DO HERE



Join us for interview prep!

#csip

>



Receive notifications around the community

#role-select

>



See what events are happening

#shared-calendar

>



Look through our resources

#general-resources

>



Introduce yourself

#intros

>

I'll just look around for now



23

- 6pm Blockchain Club
- 6pm Computer Science

24

Thanksgiving Break

25

26

27

30

- 6pm Blockchain Club
- 6pm Computer Science

Dec 1

- 12pm Girls.Code() GBM
- 5:30pm GDG Athens | C
- 6:30pm Women in Tech

2

- 7:30pm UGARC Net

3

4



MENTAL HEALTH RESOURCES

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Problem Patterns



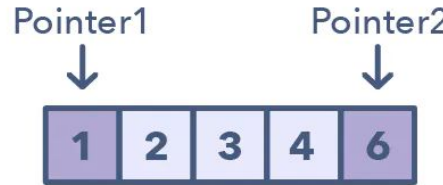
Sliding window -->



Slide one element forward



target sum = 6



$1 + 6 > \text{target sum}$, therefore let's decrement Pointer2

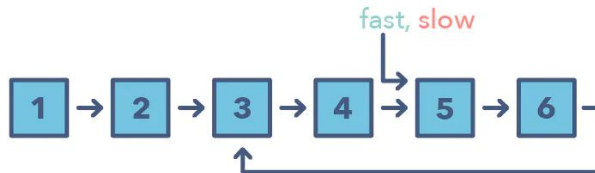
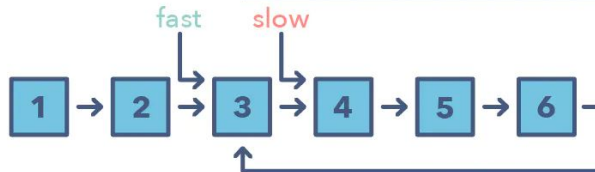
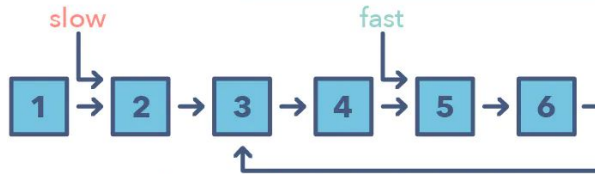
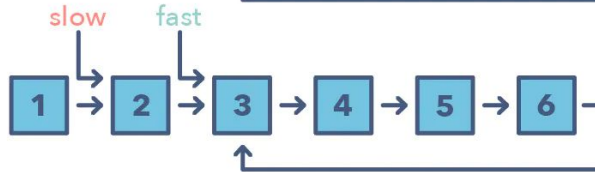
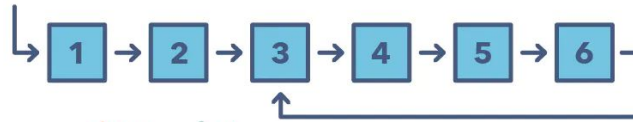


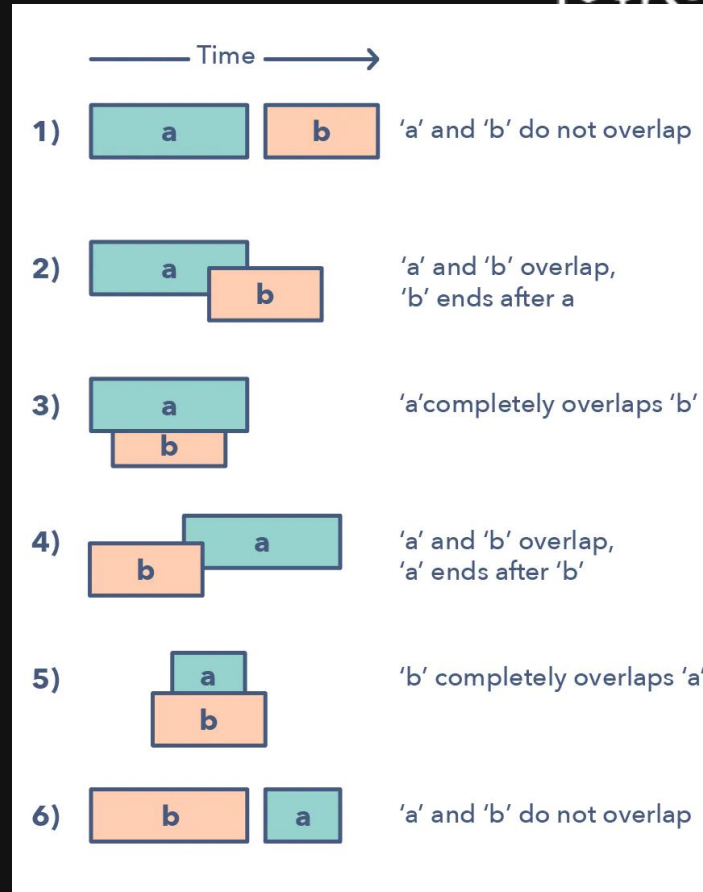
$1 + 4 < \text{target sum}$, therefore let's increment Pointer1



$2 + 4 == \text{target sum}$, we have found our pair!

fast, slow



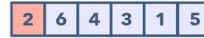


start
↓



Number '2' is not at its correct place,
let's swap it with the correct index.

start
↓



start
↓



After the swap, number '2' is placed
at its correct index.

Let's move on to the next number.

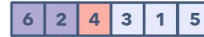
start
↓



Number '2' is at its correct place.

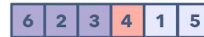
Let's move on to the next number.

start
↓



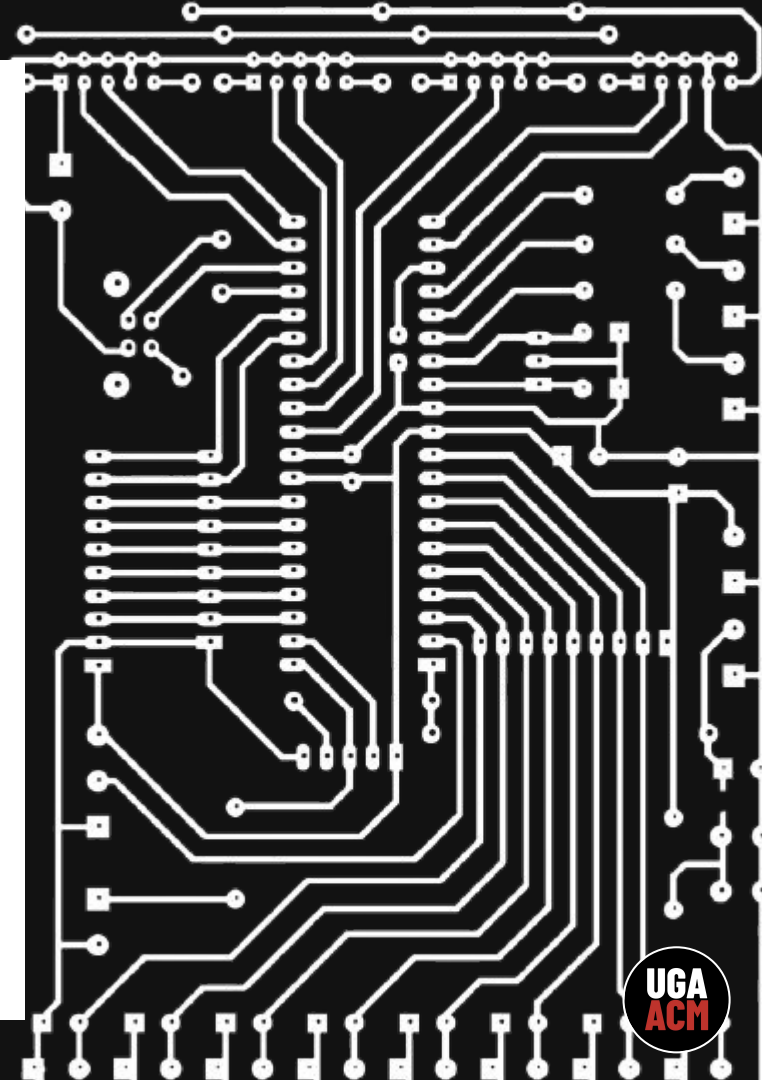
Number '4' is not at its correct place,
lets swap it with the correct index.

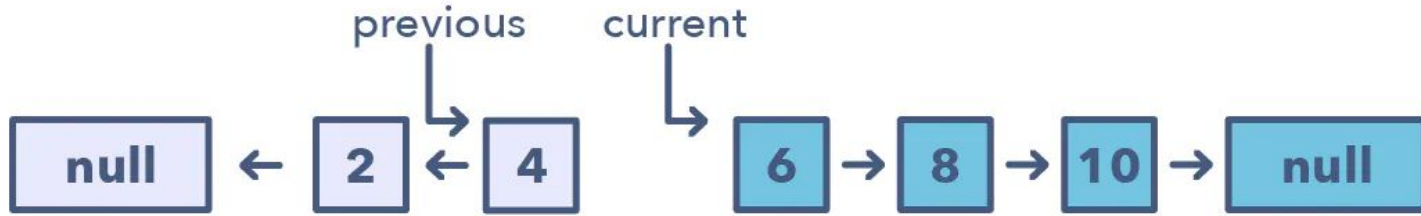
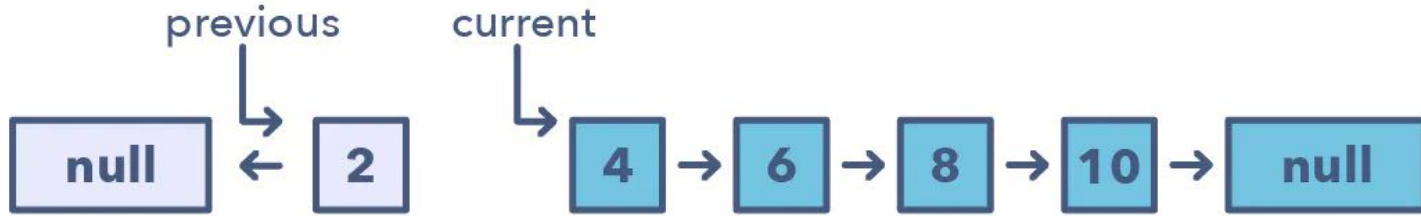
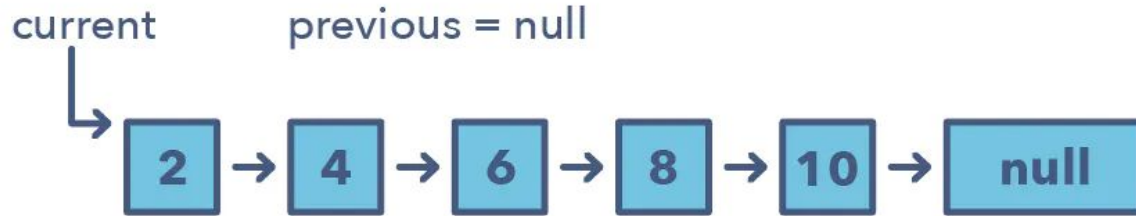
start
↓



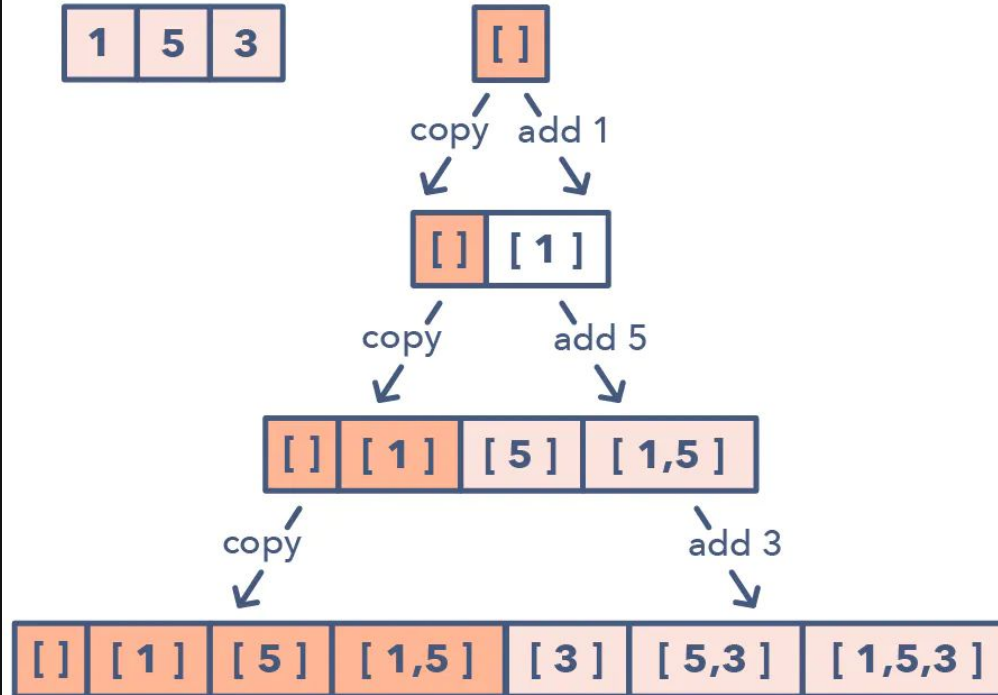
Number '4' is at its correct place.

Let's move on to the next number.

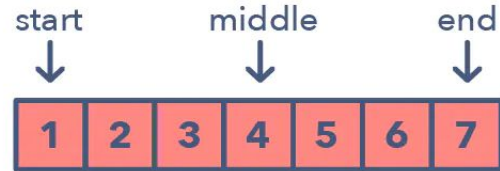




Given set:



Search 'key' = '5'



As $\text{key} > \text{arr}[\text{middle}]$, therefore $\text{start} = \text{middle} + 1$

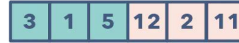


As $\text{key} < \text{arr}[\text{middle}]$, therefore $\text{end} = \text{middle} - 1$

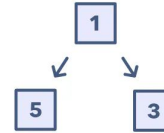


As $\text{key} == \text{arr}[\text{middle}]$, return **middle** as the required index

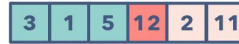
Given array:



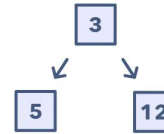
Insert the first three numbers in the heap



Given array:



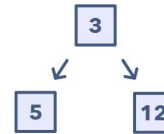
The root is smaller than '12', so take '1' out and insert '12'



Given array:



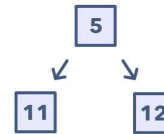
Skip '2', as it is not bigger than the root '3'



Given array:



The root is smaller than '12', so take '5' out and insert '12'



Given lists:

L1

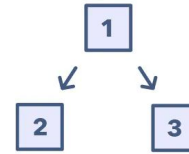
2	6	8
---	---	---

L2

3	6	7
---	---	---

L3

1	3	4
---	---	---



Insert the first number from each array in the heap

Given lists:

L1

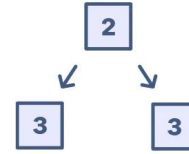
2	6	8
---	---	---

L2

3	6	7
---	---	---

L3

1	3	4
---	---	---



Merged List

1

Given lists:

L1

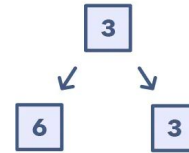
2	6	8
---	---	---

L2

3	6	7
---	---	---

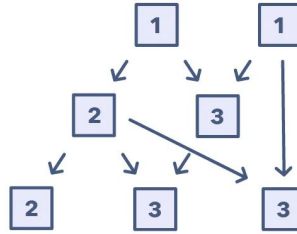
L3

1	3	4
---	---	---

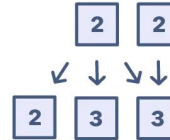


Merged List

1	2
---	---



Add all sources to the sorted list.
Remove all sources and their edges to find new sources



Sources: [3,4]
Topological Sort: "5,6"

Add all sources to the sorted list.
Remove all sources and their edges to find new sources



Sources: [0, 1, 2]
Topological Sort: "5, 6, 3, 4"

All remaining vertices are source,
so we will add them in the sorted list

Sources: []
Topological Sort: "5, 6, 3, 4, 0, 1, 2"

Practice



226. Invert Binary Tree

Easy

👍 6935

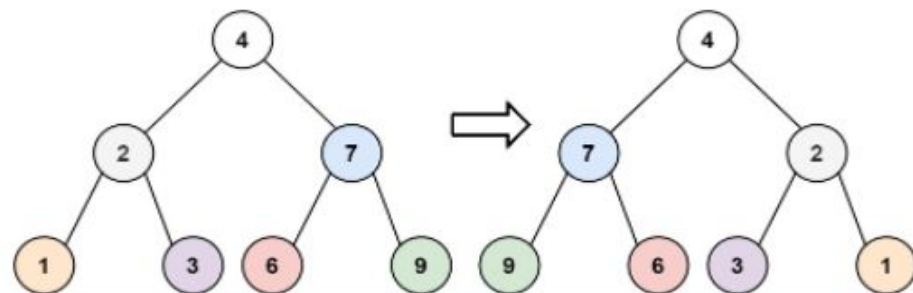
💬 95

❤️ Add to List

📄 Share

Given the `root` of a binary tree, invert the tree, and return *its root*.

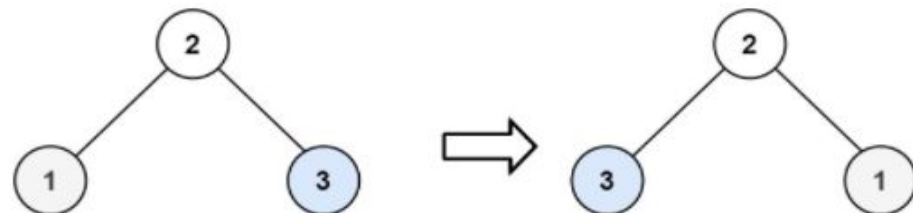
Example 1:



Input: `root = [4,2,7,1,3,6,9]`

Output: `[4,7,2,9,6,3,1]`

Example 2:



Input: `root = [2,1,3]`

Output: `[2,3,1]`

100. Same Tree

Easy

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111

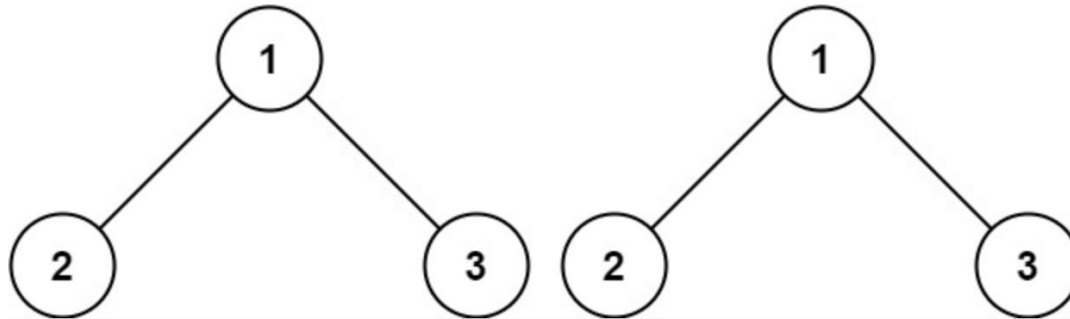
Add to List

Share

Given the roots of two binary trees p and q , write a function to check if they are the same or not.

Two binary trees are considered the same if they are structurally identical, and the nodes have the same value.

Example 1:



Input: $p = [1,2,3]$, $q = [1,2,3]$

Output: true

Example 2:



Conclusion



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