

The background features a dark theme with blurred Python code snippets. A prominent Python logo is visible on the left side, with the word 'python' written in a light blue font next to it. The code snippets include function calls like 'show\_play' and 'show\_actor' with various arguments.

# Add Two Numbers

Difficulty: **Medium**

## Members

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A hand in a dark blue suit sleeve points upwards towards a white document icon with horizontal lines. The background is a vibrant blue with abstract white and grey geometric shapes, including a large white square on the right and a grey document icon on the left. A thin white horizontal line is positioned below the title.

## Table of contents

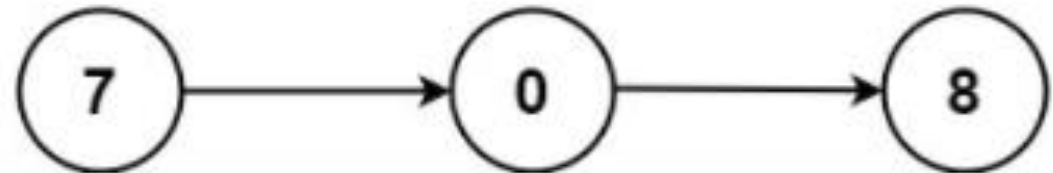
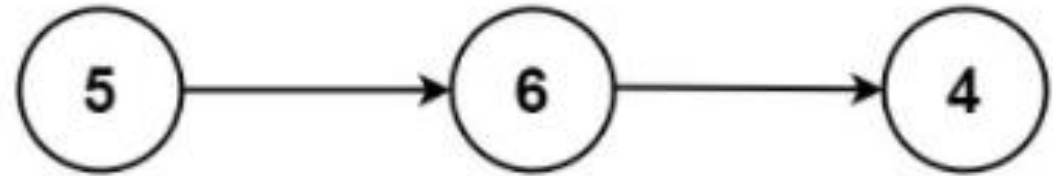
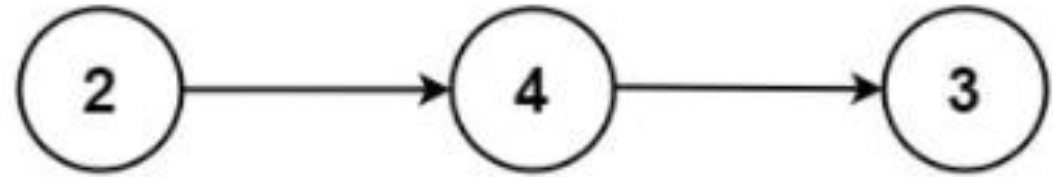
- The problem
- Analysis
- Case
- Code
- Solution
- Submission
- Reference

# The Problem

- You are given two non-empty linked lists representing two non-negative integers. The digits are stored in reverse order, and each of their nodes contains a single digit. Add the two numbers and return the sum as a linked list.
- You may assume the two numbers do not contain any leading zero, except the number 0 itself.

## Example:

- Input: l1 = [2,4,3], l2 = [5,6,4]
- Output: [7,0,8]
- Explanation:  $342 + 465 = 807$ .



# Analyze

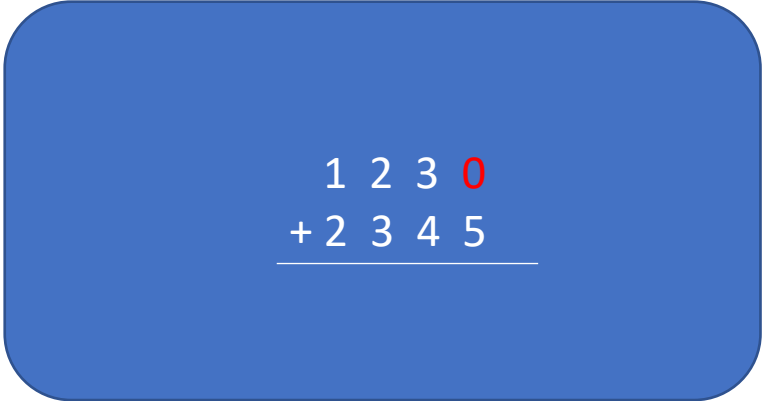
- Both list should have at least one digit of value and not be an empty list or without value.
- Non-negative integer allowed.
- We must reverse each input that is given, add them and store them as a linked list.
- Each digit will be one node.
- You are given two **non-empty** linked lists representing two **non-negative integers**. The digits are stored in **reverse order**, and each of their nodes contains a single digit. Add the two numbers and return the sum as a **linked list**.
- You may assume the two numbers do not contain any leading zero, except the number 0 itself.
- **Example:**
- Input: l1 = [2,4,3], l2 = [5,6,4]
- Output: [7,0,8]
- Explanation:  $342 + 465 = 807$ .

# Case 1

- What if there is difference in size of lists?

Example:

$$L1 = [1, 2, 3] + L2 = [2, 3, 4, 5]$$



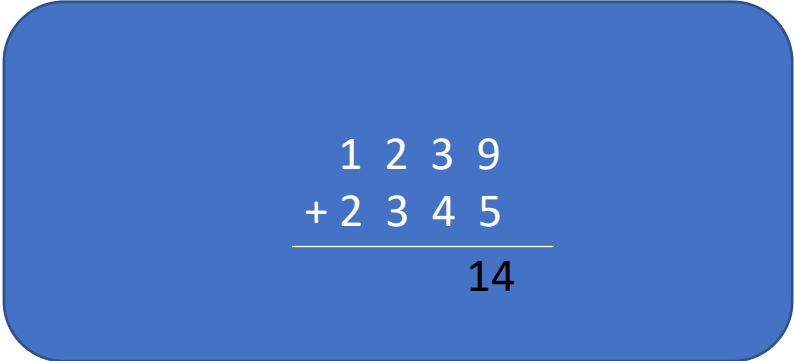
1 2 3 0  
+ 2 3 4 5

# Case 2

- What if the sum of two nodes is bigger than 9?

Example:

$$8 + 9 = \mathbf{17}$$


$$\begin{array}{r} 1\ 2\ 3\ 9 \\ +\ 2\ 3\ 4\ 5 \\ \hline 14 \end{array}$$

# Code

---

Case one and two fixes, extracting value

```
carry = 0
while l1 or l2 or carry:
    v1 = l1.val if l1 else 0
    v2 = l2.val if l2 else 0
```

Calculating new digits + storing

```
val = v1 + v2 + carry
carry = val // 10
val = val % 10
cur.next = ListNode(val)
```

Storing digits into list

```
cur = cur.next
l1 = l1.next if l1 else None
l2 = l2.next if l2 else None
return dummy.next
```

```
1 ▾ class Solution(object):
2 ▾     def addTwoNumbers(self, l1: ListNode, l2: ListNode):
3         dummy = ListNode()
4         cur = dummy
5
6         carry = 0
7 ▾     while l1 or l2 or carry:
8         v1 = l1.val if l1 else 0
9         v2 = l2.val if l2 else 0
10
11         val = v1 + v2 + carry
12         carry = val // 10
13         val = val % 10
14         cur.next = ListNode(val)
15
16         cur = cur.next
17         l1 = l1.next if l1 else None
18         l2 = l2.next if l2 else None
19     return dummy.next
20
```

# Solutions

---

Your input

```
[2,4,3]
[5,6,4]
```

Output

```
[7,0,8]
```

Expected

```
[7,0,8]
```

Your input

```
[2,4,3]
[5,6,4,8,4]
```

Output

```
[7,0,8,8,4]
```

Expected

```
[7,0,8,8,4]
```



# Submission

Time Submitted	Status	Runtime	Memory	Language
02/06/2022 11:24	Accepted	142 ms	13.9 MB	python3

## Submission Detail

1568 / 1568 test cases passed.

Runtime: **142 ms**

Memory Usage: **13.9 MB**

Status: **Accepted**

Submitted: **1 minute ago**



# Reference

- <https://leetcode.com/problems/add-two-numbers/submissions/>
- [https://www.youtube.com/watch?v=wgFPrzTjm7s&ab\\_channel=NeetCode](https://www.youtube.com/watch?v=wgFPrzTjm7s&ab_channel=NeetCode)