1634. Add Two Polynomials Represented as Linked Lists Premium

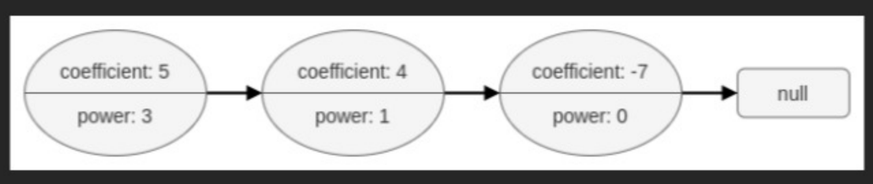
Medium | Topics | Companies | Hint

A polynomial linked list is a special type of linked list where every node represents a term in a polynomial expression.

Each node has three attributes:

- `coefficient`: an integer representing the number multiplier of the term. The coefficient of the term $9x^4$ is `9`.
- `power`: an integer representing the exponent. The power of the term $9x^4$ is `4`.
- `next`: a pointer to the next node in the list, or `null` if it is the last node of the list.

For example, the polynomial $5x^3 + 4x - 7$ is represented by the polynomial linked list illustrated below:



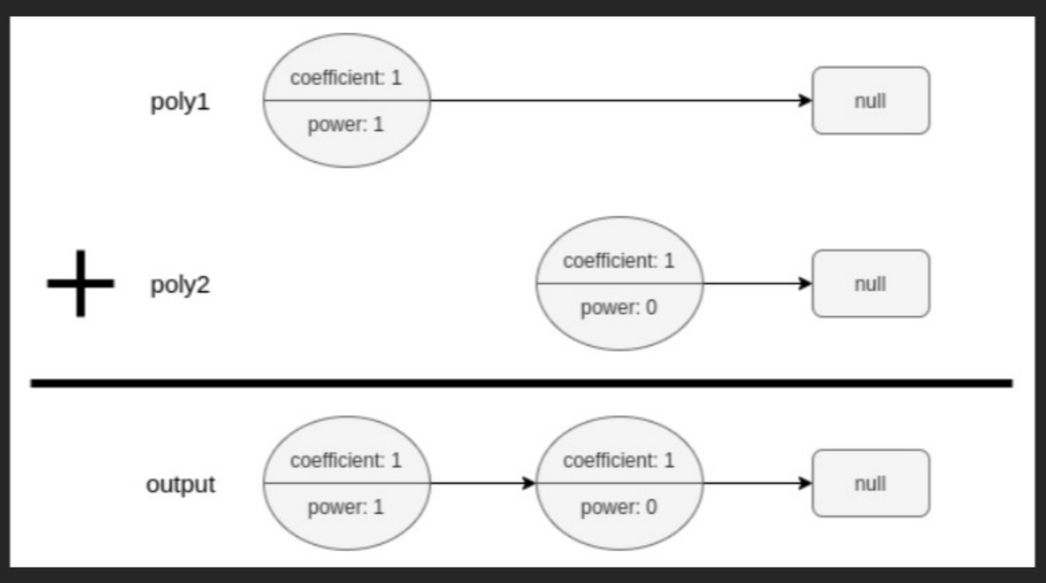
The polynomial linked list must be in its standard form: the polynomial must be in **strictly** descending order by its `power` value. Also, terms with a `coefficient` of `0` are omitted.

Given two polynomial linked list heads, `poly1` and `poly2`, add the polynomials together and return *the head of the sum of the polynomials*.

`PolyNode` format:

The input/output format is as a list of `n` nodes, where each node is represented as its `[coefficient, power]`. For example, the polynomial $5x^3 + 4x - 7$ would be represented as: `[[5,3],[4,1],[-7,0]]`.

Example 1:




```
Input: poly1 = [[1,1]], poly2 = [[1,0]]
Output: [[1,1],[1,0]]
Explanation: poly1 = x. poly2 = 1. The sum is x + 1.
```

Example 2:

```
Input: poly1 = [[2,2],[4,1],[3,0]], poly2 = [[3,2],[-4,1],[-1,0]]
Output: [[5,2],[2,0]]
Explanation: poly1 = 2x^2 + 4x + 3. poly2 = 3x^2 - 4x - 1. The sum is 5x^2 + 2. Notice that we omit the "0x" term.
```

Example 3:

```
Input: poly1 = [[1,2]], poly2 = [[-1,2]]
Output: []
Explanation: The sum is 0. We return an empty list.
```

Constraints:

- $0 \le n \le 10^4$
- $-10^9 \le$ `PolyNode.coefficient` $\le 10^9$
- `PolyNode.coefficient != 0`
- $0 \le$ `PolyNode.power` $\le 10^9$
- `PolyNode.power > PolyNode.next.power`

Seen this question in a real interview before? 1/5

Yes No

Accepted 15.4K | Submissions 25.4K | Acceptance Rate 60.5%

Topics

Linked List Math Two Pointers

Companies

0 - 6 months

Amazon 2

Hint 1

Process both linked lists at the same time

Hint 2

If the current power of the two heads is equal, add this power with the sum of the coefficients to the answer list.

Hint 3

If one head has a larger power, add this power to the answer list and move only this head.

Similar Questions

Add Two Numbers	Medium
Merge Two Sorted Lists	Easy
Add Two Numbers II	Medium

Discussion (8)