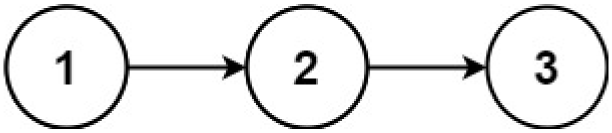
382. Linked List Random Node

Given a singly linked list, return a random node's value from the linked list. Each node must have the same probability of being chosen.

Implement the Solution class:

- Solution(ListNode head) Initializes the object with the head of the singly-linked list head.
- int getRandom() Chooses a node randomly from the list and returns its value. All the nodes of the list should be equally likely to be chosen.

Example 1:



Input

["Solution", "getRandom", "getRandom", "getRandom", "getRandom", "getRandom"]

[[[1, 2, 3]], [], [], [], [], []]

Output

[null, 1, 3, 2, 2, 3]

Explanation

Solution solution = new Solution([1, 2, 3]);

solution.getRandom(); // return 1

solution.getRandom(); // return 3

solution.getRandom(); // return 2

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solution.getRandom(); // return 2

solution.getRandom(); // return 3

// getRandom() should return either 1, 2, or 3 randomly. Each element should have equal probability of returning.
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Constraints:

- The number of nodes in the linked list will be in the range [1, 10^4].
- $-10^4 <= \text{Node.val} <= 10^4$
- At most 10^4 calls will be made to getRandom.

Follow up:

- What if the linked list is extremely large and its length is unknown to you?
- Could you solve this efficiently without using extra space?