

707. Design Linked List

Description

Design your implementation of the linked list. You can choose to use a singly or doubly linked list.

A node in a singly linked list should have two attributes: `val` and `next` . `val` is the value of the current node, and `next` is a pointer/reference to the next node.

If you want to use the doubly linked list, you will need one more attribute `prev` to indicate the previous node in the linked list. Assume all nodes in the linked list are **0-indexed** .

Implement the `MyLinkedList` class:

- `MyLinkedList()` Initializes the `MyLinkedList` object.
- `int get(int index)` Get the value of the `indexth` node in the linked list. If the index is invalid, return `-1` .
- `void addAtHead(int val)` Add a node of value `val` before the first element of the linked list. After the insertion, the new node will be the first node of the linked list.
- `void addAtTail(int val)` Append a node of value `val` as the last element of the linked list.
- `void addAtIndex(int index, int val)` Add a node of value `val` before the `indexth` node in the linked list. If `index` equals the length of the linked list, the node will be appended to the end of the linked list. If `index` is greater than the length, the node **will not be inserted** .
- `void deleteAtIndex(int index)` Delete the `indexth` node in the linked list, if the index is valid.

Example 1:

Input

```
["MyLinkedList", "addAtHead", "addAtTail", "addAtIndex", "get", "deleteAtIndex", "get"]  
[[], [1], [3], [1, 2], [1], [1], [1]]
```

Output

```
[null, null, null, null, 2, null, 3]
```

Explanation

```
MyLinkedList myLinkedList = new MyLinkedList();  
myLinkedList.addAtHead(1);  
myLinkedList.addAtTail(3);  
myLinkedList.addAtIndex(1, 2);    // linked list becomes 1->2->3  
myLinkedList.get(1);              // return 2  
myLinkedList.deleteAtIndex(1);    // now the linked list is 1->3  
myLinkedList.get(1);              // return 3
```

Constraints:

- `0 <= index, val <= 1000`
- Please do not use the built-in `LinkedList` library.
- At most `2000` calls will be made to `get` , `addAtHead` , `addAtTail` , `addAtIndex` and `deleteAtIndex` .

