Problem 2: Design a data structure that follows the constraintsof **Least Recently Used (LRU) cache**

```
class LRUCache:

    class Node:
        def __init_(self, key=None, value=None):
            self.key = key
            self.value = value
            self.prev = None
            self.next = None

    def __init_(self, capacity):
        self.capacity = capacity
        self.cache = {}
        self.head = self.Node()
        self.tail = self.Node()
        self.head.next = self.tail
        self.tail.prev = self.head

    def _add_node(self, node):
        # Add a node to the front of the linked list
        node.prev = self.head
        node.next = self.head.next
        self.head.next.prev = node
        self.head.next = node

    def _remove_node(self, node):
        # Remove a node from the linked list
        prev = node.prev
        next = node.next
        prev.next = next
        next.prev = prev
    def _move_to_front(self, node):
        # Move a node to the front of the linked list
        self._remove_node(node)
        self._add_node(node)

    def _pop_tail(self):
        # Remove and return the tail node from the linked list
        tail_node = self.tail.prev
        self._remove_node(tail_node)
        return tail_node

    def get(self, key):
        if key in self.cache:
            node = self.cache[key]
            self._move_to_front(node)
            return node.value
        else:
            return -1
    def put(self, key, value):
        if key in self.cache:
            node = self.cache[key]
            node.value = value
            self._move_to_front(node)
        else:
            new_node = self.Node(key, value)
            self.cache[key] = new_node
            self._add_node(new_node)
            if len(self.cache) > self.capacity:
                tail_node = self._pop_tail()
                del self.cache[tail_node.key]
lru_cache = LRUCache(2)
lru_cache.put(1, 1)
lru_cache.put(2, 2)
```

print(lru_cache.get(1))

lru_cache.put(3, 3)

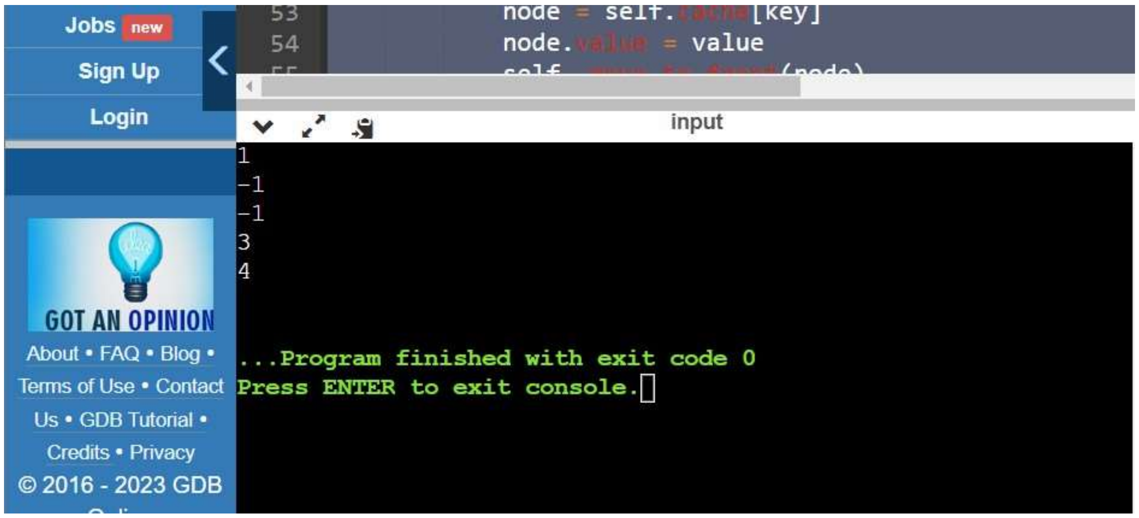
print(lru_cache.get(2))

lru_cache.put(4, 4)

print(lru_cache.get(1))

print(lru_cache.get(3))

print(lru_cache.get(4))



```
        node = self.cache[key]
        node.value = value
```

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input

```
1
-1
-1
3
4


...Program finished with exit code 0
Press ENTER to exit console.
```