**Problem 2:** Given a Linked list that has two pointers in each node and one of which points to the first node and the other points to any random node. Write a program to clone the LinkedList.

```
class Node:
    def __init__(self, val):
        self.val = val
        self.next = None
        self.random = None

def clone_linked_list(head):
    if not head:
        return None

    node_map = {}



    current = head
    while current:
        cloned_node = Node(current.val)
        node_map[current] = cloned_node
        current = current.next

    current = head
    while current:
        cloned_node = node_map[current]
        cloned_node.next = node_map.get(current.next, None)
        cloned_node.random = node_map.get(current.random, None)
        current = current.next
```

```
    return node_map[head]

def print_linked_list(head):
    current = head
    while current:
        random_val = current.random.val if current.random else None
        print(f"({current.val},  {random_val}) -> ", end="")
        current = current.next
    print("None")

    head = Node(1)
    node2 = Node(2)
    node3 = Node(3)
    node4 = Node(4)

    head.next = node2
    node2.next = node3
    node3.next = node4

    head.random  =  node3
    node2.random  =  head
    node3.random  =  None
    node4.random = node2


    cloned_head = clone_linked_list(head)


    print("Original linked list:")
    print_linked_list(head)
```

```
print("\nCloned linked list:")
print_linked_list(cloned_head)
```