

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
```

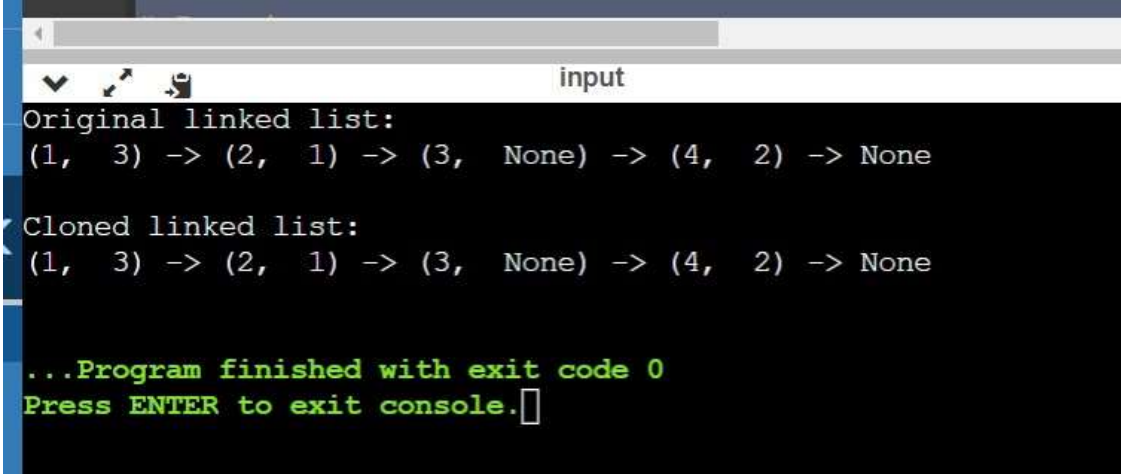
```
node4.random = node2
```

```
cloned_head = clone_linked_list(head)
```

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

```
print_linked_list(head)
```

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



The screenshot shows a terminal window with a title bar that includes a maximize button, a close button, and the word "input". The terminal output is as follows:

```
Original linked list:  
(1, 3) -> (2, 1) -> (3, None) -> (4, 2) -> None  
  
Cloned linked list:  
(1, 3) -> (2, 1) -> (3, None) -> (4, 2) -> None  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```
