CSE331
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Section 2

Written Questions:

1. Each of your responses should give bounds on the running time in terms N and M. Were N is the number of players, and M is the number of passes. Justify each of your answers in paragraph form.
    a. Assuming a constant M, what is the upper bound on the running time of our version of the josephus problem?

O(n) Is the general case and this is because singly-linked list or even a doubly-linked list's worst running time is O(n) for accessing and searching of values.

    b. Assuming a random M, what is the upper bound on the running time of our version of Josephus problem?

This is also O(n) because 1<=m<=n so even though we have a random M the upper bound or worst case running time scenario can only go up to n number of times in our Josephus problem.

2. Write an algorithm, in pseudo code, to reverse a singly linked list O(N) time. Justify your answer in paragraph form.

```
void Reverse_singlylinkedlist(Node *&head){
        Node *prev = NULL;
        Node *curr = head;
        While(curr){
                Node *next = curr -> next;
                curr -> next =prev;
                prev = curr;
                curr = next;
        }
        head = prev;
}
```

The reverse method is passed a head node. The method creates a previous node and sets it equal to null and creates a current node point to the head to start off the list. While the current returns not null it loops through. Creating another node called next that is equal to what current is pointing to. Then we simply set the previous equal to current and current back to next and keep iterating through the list till current hits the end of the list. Which then the head is set to the previous to bring it back to the front.