Question 2.3 from CTCI: Delete Middle Node

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Question

Implement an algorithm to delete a node in the middle of a single linked list, given only access to that node.
Input: node Z from linked list $A- > B- > Z- > C- > D$ Output: $A- > B- > C- > D$

Hints

1. What are some base cases that would make this operation unable to be performed? Think of list sizes. Also think of what type is returned. Is this a boolean? Or is a new list returned?
2. Now, think of the best way to go about deletion. You have to manipulate the pointer so that it points to the next item from the item to be deleted.
3. This is a boolean method. If the deletion cannot be performed, return false. Otherwise, it is performed, and return true.

Code

```
/*Answer 1*/
public static boolean deleteMiddle(Node n){
   if(n == null || n.next == null){
      return false;
   }

   Node next = n.next;
   n.data = next.data
   n.next = next.next //node has been deleted
   return true;
}
```

Big O analysis

O(1) because you only have to change what the pointer is pointing to; you don't have to go through the whole list.