MIDDLE OF LINKEDLIST

☆ We are given a singly linked list and our job is to return the node which is at the middle

Brute force approach is to traverse through the entire LinkedList, find number of elements, and then return the $\frac{N}{2} + 1$ node at another traversal

Time Complexity is $O(3N/2)$

Optimal solution is using the tortoise & hare method. This involves having 2 pointers (slow | fast). At each iteration, fast pointer moves by 2 steps and slow pointer. When fast pointer reaches the end, the slow pointer will be halfway.

C++ :

```
Node * middleOfLL(Node * head) {
    Node* s = head, fast = head;
    while(f != nullptr && f->next != nullptr){
        s = s->next;
        f = f->next->next;
    }
    return s;
}
```