

1. Consider the following function definition and suppose that 1) the `node` class consists of an integer `data` element, and a node pointer called `next`, and 2) variable `head` is the address of a linked list of such nodes.

What does the function do?

```
void fun(node * curr) {
    if (curr != NULL)
        cout << curr->data;
        if (curr->next != NULL) {
            fun(curr->next->next);
        }
}

node * head = NULL;
// maybe insert data into the chain here
fun(head);
```

- A. `fun` segfaults on lists of odd length.
- B. [Correct Answer] `fun` prints every other element of the list.
- C. `fun` prints the elements of the list from `head` to the end.
- D. [Your Answer] None of the other options is correct.
- E. `fun` prints the reverse of the list.

2. In a doubly linked list of size  $n$ , you are given the address of the last node. What will be the time required to access the data stored in the second last node?

- A.  $O(\log \log n)$
- B.  $O(n)$
- C.  $O(\log n)$
- D. [Correct Answer] [Your Answer]  $O(1)$
- E. It cannot be accessed

3. Which of the following List ADT implementations gives us an  $O(1)$  time for `insertAtEnd`, i.e inserting an element at the end of the list?

- I. A singly-linked list with only a head pointer.
  - II. A singly-linked list with head and tail pointers.
  - III. A doubly-linked list with only a head pointer.
  - IV. A doubly-linked list with head and tail pointers.
- A. I and III
  - B. I, III and IV
  - C. None of the other options is correct
  - D. [Correct Answer] [Your Answer] II and IV
  - E. I, II, III and IV

4. Consider a class `List` that is implemented using a singly linked list with only a head pointer (i.e. pointer to the first node in the list).

Given that implementation, which of the following operations could be implemented in  $O(1)$  time?

- I. Insert item at the front of the list
  - II. Insert item at the rear of the list
  - III. Delete front item from list
  - IV. Delete rear item from list
- A. All of them
  - B. I and II
  - C. [Your Answer] I, II and III
  - D. I, II and IV
  - E. [Correct Answer] I and III

5. In a singly linked list containing  $n$  nodes, the time required to find the maximum element is:

- A.  $O(\log n)$ .
- B. [Correct Answer] [Your Answer]  $O(n)$ .
- C.  $O(1)$ .
- D.  $O(n \log n)$ .
- E.  $O(n^2)$ .