

AP Computer Science
Linked List M/C Homework

Name: Tanmai Kalisipudi

1. Consider the following method:

```
public static void mystery(ListNode p){  
    if (p != null){  
        mystery(p.getNext().getNext());  
        p.setNext(p.getNext().getNext());  
    }  
}
```

What changes does mystery make to the list whose first node is p ?

- (A) It makes no changes to the list.
- (B) It removes the first, third, and all odd nodes from the list.
- (C) It removes the second, fourth, and all even nodes from the list.
- (D) It removes all nodes except the first node of the list.
- ☒ (E) If the number of nodes in the list is odd, it will cause a NullPointerException; otherwise, it removes half of the nodes from the list.

2. Consider the following partial class declaration.

```
public class LList{  
    private ListNode front;  
    public LList(){  
        front = null;  
    }  
    public void addToLList(Comparable obj){  
        front = addHelper(front, obj);  
    }  
    private ListNode addHelper(ListNode list, Comparable obj){  
        if (list == null || obj.compareTo(list.getValue()) == 0){  
            list = new ListNode(obj, list);  
            return list;  
        }  
        else{  
            list.setNext(addHelper(list.getNext(), obj));  
            return list;  
        }  
    }  
    // ... other methods and data not shown  
}
```

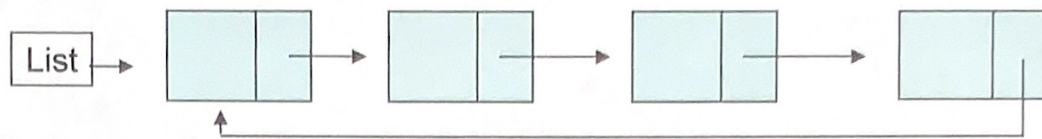
Consider the following code segment that appears in a client program.

```
LList list = new LList();  
list.addToLList("manager");  
list.addToLList("boy");  
list.addToLList("girl");  
list.addToLList("anyone");  
list.addToLList("place");  
list.addToLList("vector");
```

What values are in list after the code segment has been executed?

- (A) [anyone, boy, girl, manager, place, vector]
- ☒ (B) [manager, boy, girl, anyone, place, vector]
- (C) [vector, place, anyone, girl, boy, manager]
- (D) [vector, place, manager, girl, boy, anyone]
- (E) Nothing is in list because a NullPointerException was thrown during the execution.

3. A circular linked list is defined to be a linked list where the last node points back to the first node (see below:)



Which of the following indicates changes that would need to be made to a system that already used a regular linked list in order to implement this data structure correctly?

- I. The ListNode class would have to be modified
- II. The code used to build the list would have to be modified
- III. The code to print the list would have to be modified

- a. I, II, and III
- b. I and II only
- ☒ c. II and III only
- d. I only
- e. II only

Consider the following data structure for questions 4 and 5.

A doubly linked list is a linked list where each node not only points to the one after it, but also to the previous node. (see below:)



4. Which of the following indicates changes that would need to be made to a system that already used a regular linked list in order to implement this data structure correctly?

- I. The ListNode class would have to be modified
- II. The code used to build the list would have to be modified
- III. The code to print the list would have to be modified

- a. I, II, and III
- ☒ b. I and II only
- c. II and III only
- d. I only
- e. II only

5. Which of the following operations would be more efficient with a doubly linked list, as opposed to a singly linked list?

- I. Sorting (Standard Insertion Sort)
- II. Searching for a specific element (standard Linear Search)
- III. Inserting an element into sorted order

- a. I only
- b. II only
- c. III only
- d. I and III only
- ☒ e. none of the above algorithms would have added efficiency from a doubly linked list.