

## Midterm 1 Review

1. List implementations.
2. Stack & Queue implementations
3. Iterator Implementations for List, Stack & Queue.
4. Implement remove(E val) method for DoublyLinkedList class that we discussed in class. This method remove the first occurrence of the node that contains the val.
5. Implement a Queue using Stack
6. Implement a Stack using Queue
7. Reverse a singly linked list.(No more than 12 lines)

```
public Node reverseList(Node head);
```

You may define other helper methods.

Ex:

before: 1->2->3->4->5->NULL

after: 5->4->3->2->1->NULL

8. Runtime Analysis.

Estimate the following method using Big O.

a) `Void func(int []arr){`

```
    Int max = arr[0];
```

```
    For(int i =1;i< arr.length;i++){
```

```
        If(max <= arr[i])
```

```
            max = arr[i]
```

```
    }
```

```
    Return max;
```

```
}
```

b) Estimate the runtime of add, remove methods of data structure that we discussed in class.

c)  $t(n) = 5\log_2(n^2) + (\log_2(n))^2 + \log_2(n) + (\log_2(100))^3$ .

d)  $t(n) = 2t(n/2) + n$ .

e)  $t(n) = 4t(n/3) + n$

f)  $t(n) = t(n-1) + 1$

g) `void func(int[][] arr){`

```
    int x = 0;
```

```
    for(int i =0;i< 10;i++){
```

```
        for(int j =0;j< I;j++){
```

```
            x+=j;
```

```
        }
```

```
    }
```

```
    System.out.println(x);
```

```
}
```