Exam

Monday, January 10, 2022 9:32 AM

Q3

(a)(i)

A → 11 → 3

B → 1

C → 1 → 2

D → 9 → 1 → 4

E → 0

F → 5

index	0	1	2	3	4	5	6	7
array	E	B	C	A	D	F		

(ii)

A → 11 → 3

B → 1

C → 1+7 → 0

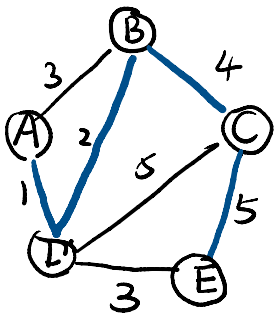
D → 9 → 1 → 9+1 → 2

E → 0+3 → 3 → 0+3×2 → 6

F → 1+5 → 1+5×2 → 1+5×3 → 1+5×4 → 5

index	0	1	2	3	4	5	6	7
array	C	B	D	A		F	E	

(b)



A	B	C	D	E	
0, A	∞, B	∞, C	∞, D	∞, E	
0, A ✓	∞, B	∞, C	1, A	∞, E	A
0, A ✓	3, D	∞, C	1, A ✓	∞, E	D
0, A ✓	3, D ✓	7, B	1, A ✓	∞, E	B
0, A ✓	3, D ✓	7, B ✓	1, A ✓	12, C	C
0, A ✓	3, D ✓	7, B ✓	1, A ✓	12, C ✓	E

Q1 (a)

```
void delete_nth(int n)
{
        //WRITE THE CODE THAT SHOULD BE HERE
        If(size < n or n < 0)
        {
                throw IllegalArgumentException
        }
        Node  TempNode = first;
        For (int i = 0;i < n; i++){
                If(i==n-1){
                        NodeIn(TempNode).next = NodeIn(TempNode).next.next
                        return
                }
                TempNode = TempNode.Next
        }
}
```

(b) delete_all_from_start()

n × 1

O(n)

delete_all_from_end()

n + n-1 + n-2 + ... + 1

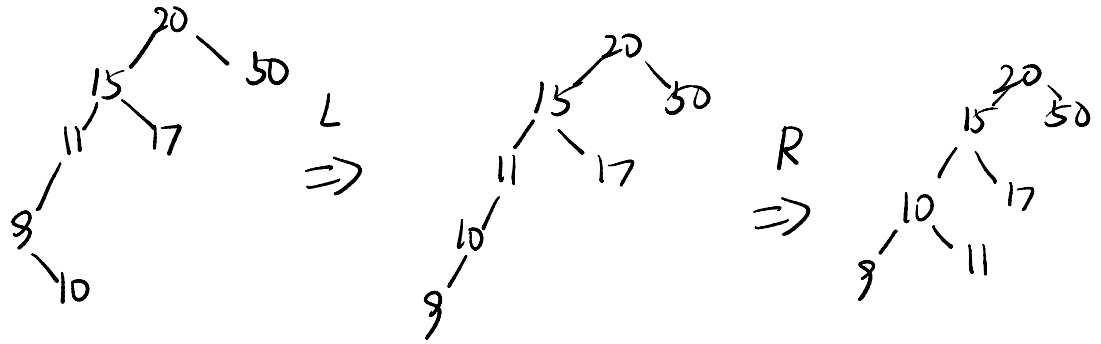
$= \frac{(n+1)n}{2}$

$\therefore O(n^2)$

```
void delete_all(){
        If(size > 0){
        first = END
        }
        return
}
```

Q2

(b)



(a)

```
stack = new BTNode[]
top = 0
size = 0

printTree(BTNode t){
        push(t, stack)
        While(true){
                If(top(stack).left != END){
                        push(top(stack).left, stack)
                        print(top(stack).left)
                }
                else if(top(stack).right != END){
                        push(top(stack).right, stack)
                        print(top(stack).right)
                }
                else{
                pop(stack)
                }
        }
}
```