

Final Exam CS 302

Name:
NSHE ID:

Question 1:

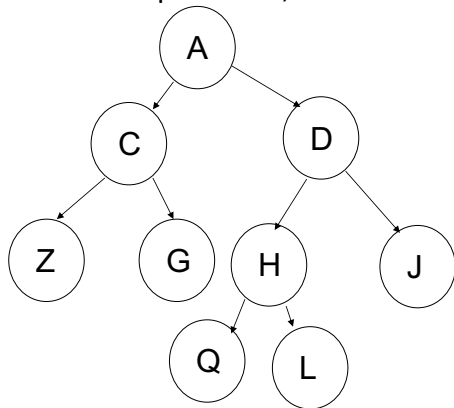
What's the time complexity of the below operations:

```
(a). for (let i = 0; i < n; i++){  
    for (let j = 0; j < m; j++){  
        cout << i << " " << j;}}
```

```
(b). for (int i = n; i > 0; i=i/2){  
    for (int j = 0; j < n; j++){  
        cout << "hello"; }}
```

Question 2:

What's the pre-order, in-order traversal of the below tree?



Question 3:

Insert below into a AVL tree. Please write down each step of rotation to make it an AVL tree.

Insert: 50, 25, 75, 20, 90, 70, 100, 95

Question 4:

Please indicate the computational complex of the below list-based priority queue.

	insertItem	removeMin	minKey	minElement
Unsorted list implementation				
sorted list implementation				

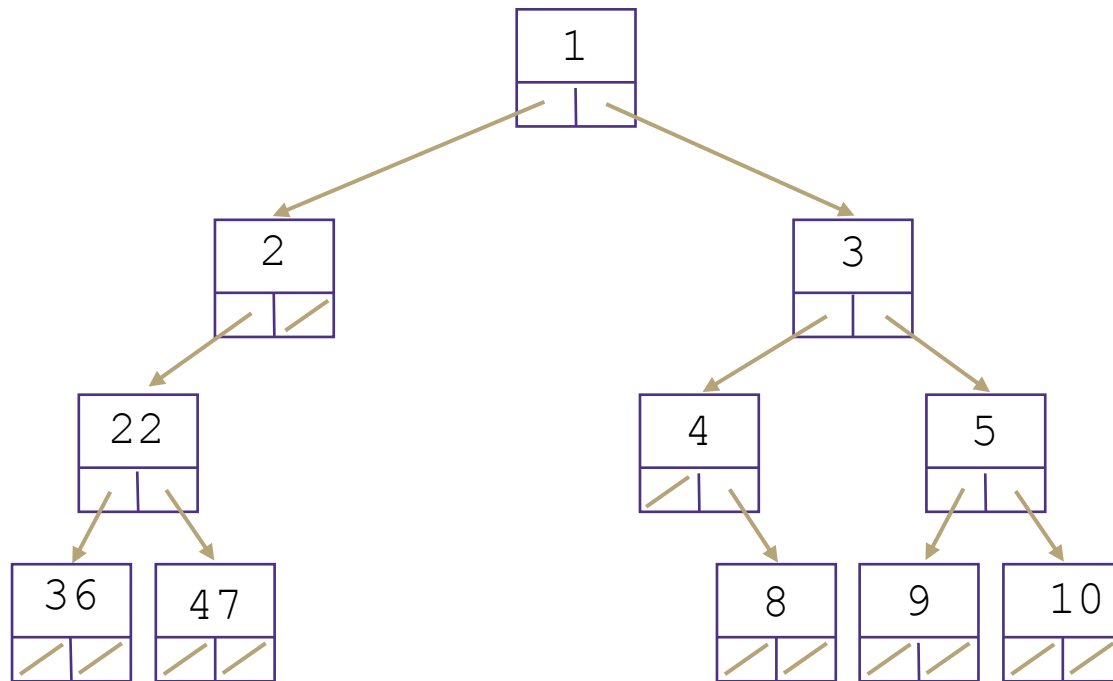
Question 5:

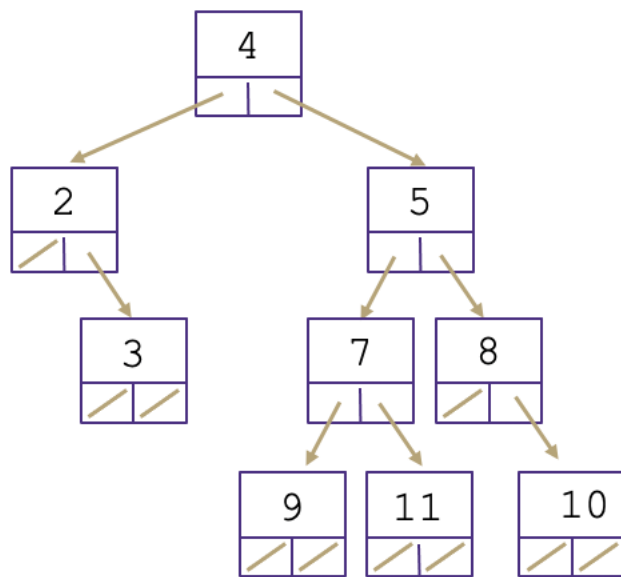
Given the below list-data, implement a selection sort for the priority queue.

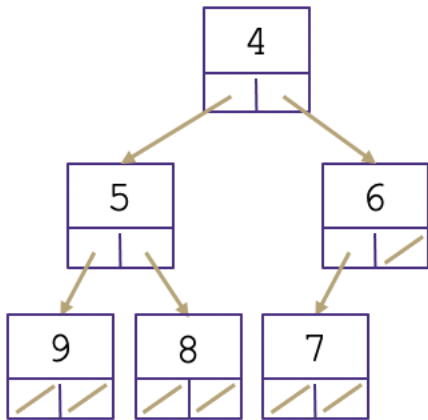
	Sequence S	Priority Queue P
Input	(7, 4, 8, 2, 5, 3, 9)	()
Phase 1: (a) (b) ... (g)		
Phase 2: (a) (b) (c) (d) (e) (f) (g)		

Question 6:

Is it a binary heap? Why or why not?

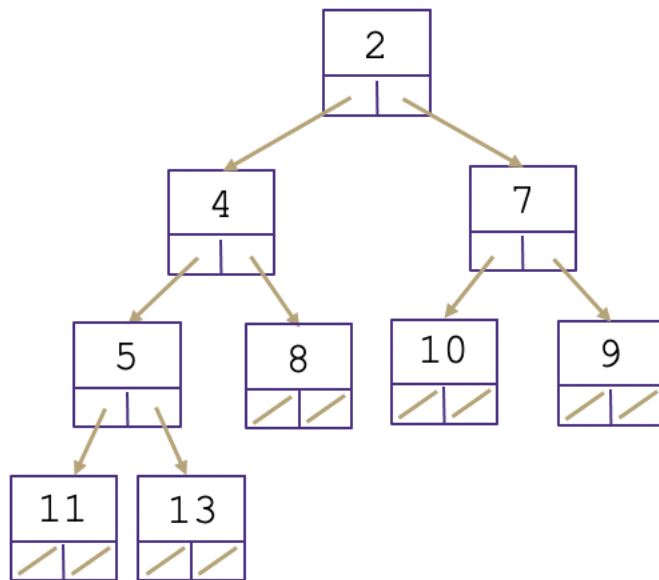






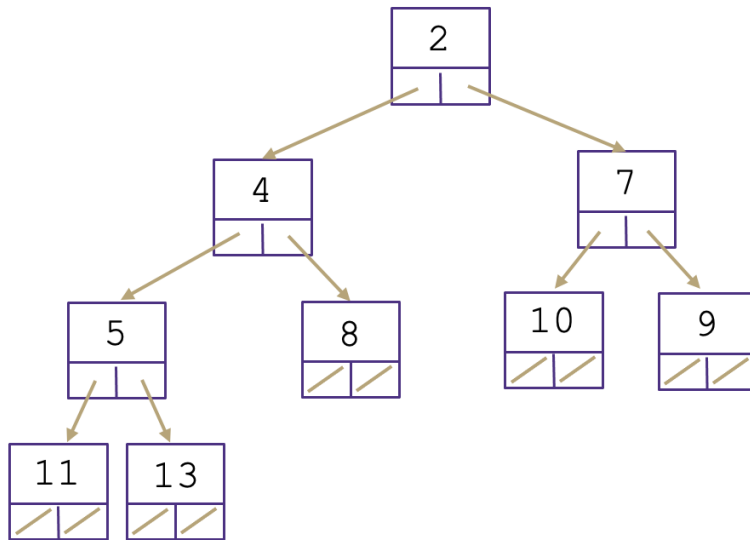
Question 7:

implement removeMin() for the below binary heap



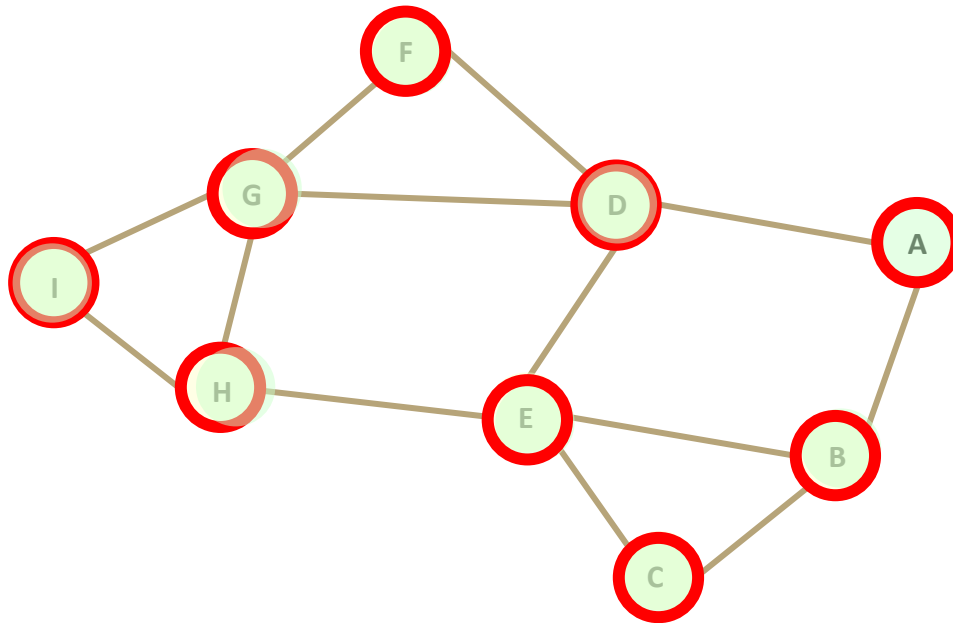
Question 8:

implement insert() for the below binary heap: insert a node with value 3.



Question 9:

fill out each step in the three parts: current node, queue, and visited, for implementing breadth first search for traversing a graph



Current node: A

Queue:

Visited:

