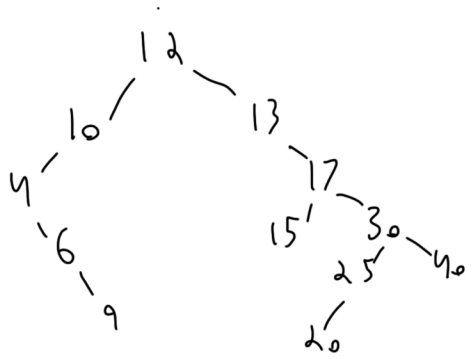
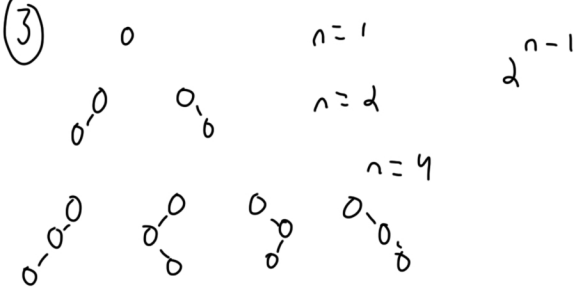
1) Using a min heap/ priority queue, we can plug into each node each of our k lists and assign the key to the value of each list at index 0. The algorithm will extract min, deleting our entire list. We then grab the first value from said list, and re-insert our list with the value at index 0 removed. This gives us logk time and n time to insert into our new sorted list.

2)



3)



Each n value adds twice of the permuations for the next.
ex: 3 nodes is 2 * (2 nodes = 2) = 4

4)