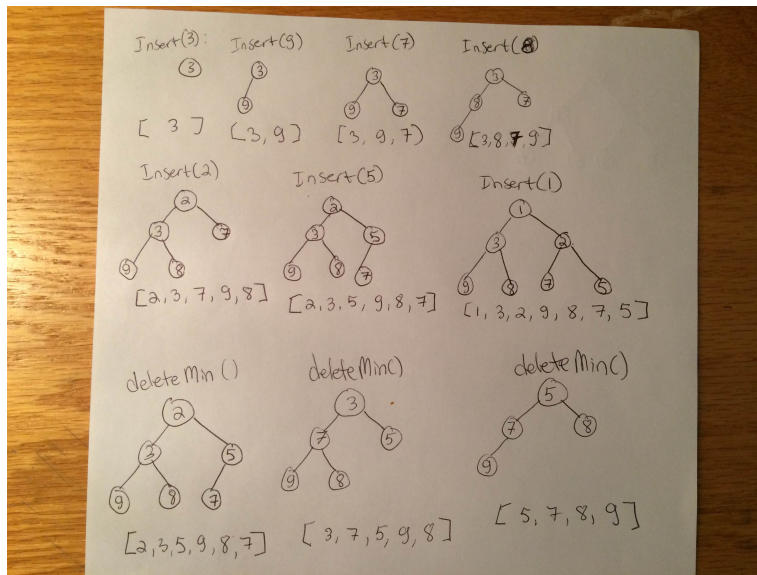
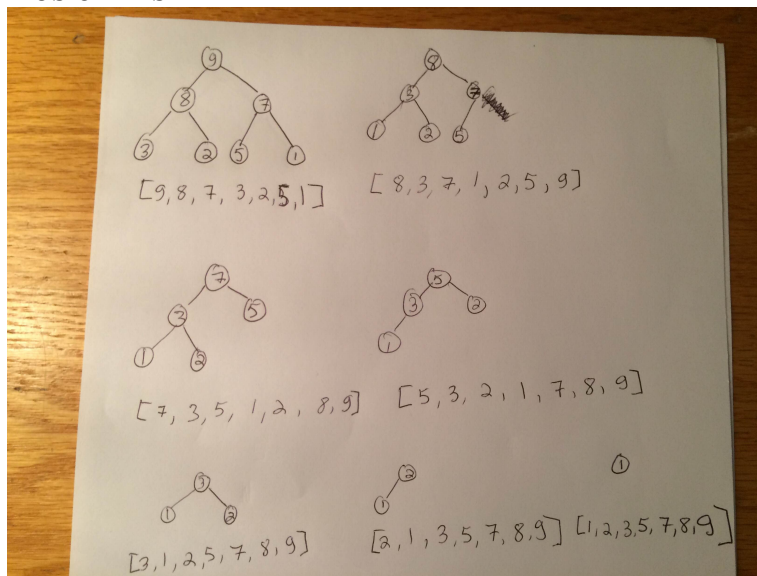


Problem 1 a.



Problem 1 b.



Problem 2

- Each level has one node more than the sum of the previous levels. Adding one level increases the space by $n+1$ and thus adding two levels increases the space by $n+n+1+1 = O(n)$.
- A complete tree with n nodes has height $\log(n)$ and takes n space. This tree has height $2 \log(n) = \log(n^2)$ and therefore takes $O(n^2)$.
- This tree has height $4.1 \log(n) = \log(n^{4.1})$ and therefore takes $O(n^{4.1})$.
- This tree has n levels, which means it takes $O(2^n)$.