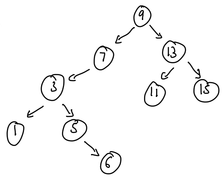
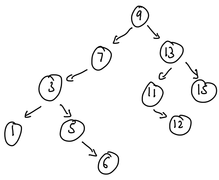
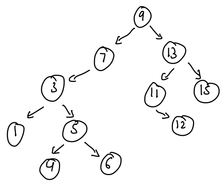
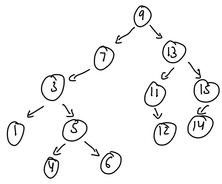
Wednesday, December 7, 2022 5:58 PM

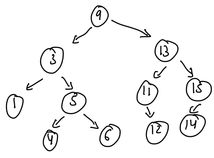
Q1

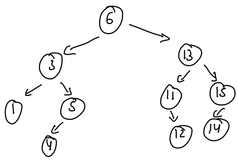


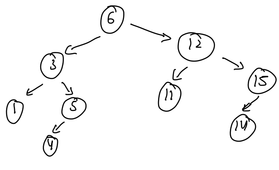


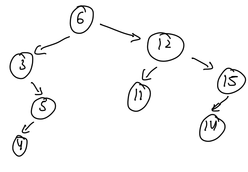


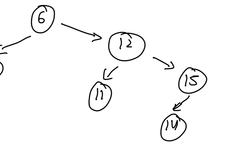


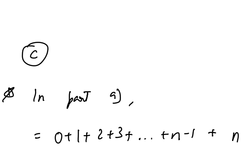












Q2. (c)

∅ In part a),

$= 0+1+2+3+\dots+n-1 + n \times 1$ inserts

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

$= \frac{n^2}{2} - \frac{n}{2} + n$

$= \frac{n^2}{2} + \frac{n}{2}$

Run-Time $= \theta(\frac{n^2+n}{2}) = \boxed{\theta(n^2)}$

∅ In part b),

$= \left(\frac{n+1}{2}\right)\left(\log\left(\frac{n+1}{2}\right) + 1\right)$ inserts

as

$(2^0)(0 + \theta(1))$

+

$(2^1)(1 + \theta(1))$

+

$(2^2)(2 + \theta(1))$

⋮

$= \theta\left(\left(\frac{n+1}{2}\right)\left(\log\left(\frac{n+1}{2}\right)\theta(1)\right)\right)$

$= \boxed{\theta(n \log n)}$