David Hatcher

74842093

Homework 3

1.

a.

i. Line 5 – O(1)
ii. Line 6 – O(1)
iii. Line 7 – O(1)
iv. Line 4 – O(n – delta - 1) or O(n - delta)
v. **Total worst-time** is O(n – delta)

b. O(lgn -1) -> O(lgn)

c.

i. O(n) – O(delta) = O(n) – O(n/2) + O(n) – O(n/4) + … + O(n) – O(1)
ii. $\sum_{i=0}^{lgn} n - \frac{n}{2^i} = n * \sum_{i=0}^{lgn} 1 - \frac{1}{2^i} = n * \big(O(lgn) - O(1)\big)$
iii. $= n * \big(O(lgn - 1)\big) = n * O(lgn) = O(n * lgn)$

2.