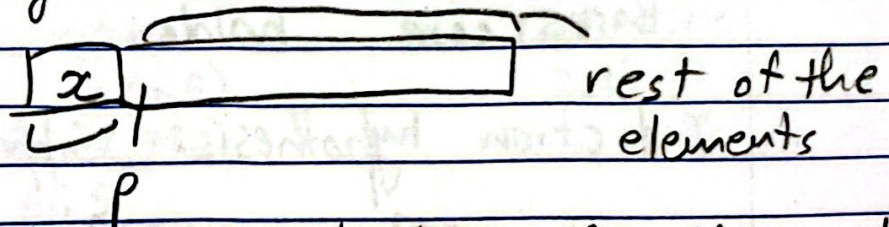


EOC 4

1 Worst case complexity for quicksort:

Worst case occurs when we already have a sorted array and the partition splits the array from the first element



This step keeps repeating further and further down the array which leads to:

$$[N + (N-1) + (N-2) + (N-3) + \dots + 2]$$

$$= \frac{N(N+1)}{2} - 1 = O(N^2)$$

2 [16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1]

 [2] ← [1] [16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2]

 [1, 2] ← [2] [16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3]

 [1, 2, 3] ← [3] [16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4]

 [1, 2, 3, 4] ← [4] [16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5]

 [1, 2, 3, 4, 5] ← [5] [16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6]

This goes till the array is sorted for the next 10 instances.