Dong, Boyuan

ID: 1547489

DATE / / NO

WQ #15.

Runtime analysis — big-O

First instruction take $O(1)$-time

The for-loop iterates $O(n)$ times!

Each iteration: one constant instruction + the while loop.

The while-loop iterates $O(n)$ times

Overall runtime: $O(1) + O(n)(O(n) + O(1)) = O(n^2)$

Runtime analysis — big-Ω

The for-loop iterates $\Omega(n)$ times

The while-loop iterates $\Omega(n)$ times

So our runtime is at least $\Omega(n) \cdot \Omega(n) = \Omega(n^2)$

Conclusion: runtime is $\Theta(n^2)$.