

n

n

n

n

n

$O(n^2)$

How efficient is Insertion Sort?

- Let our array contain n elements.
- We need to shift each element to the left as far as it can go.
- That is, we need to shift n elements each as far left as they can go.
- When shifting an element to the left, it could maximally swap with n other elements.
- So, in the worst case, we could shift n elements to the left, each requiring n swaps.
- Our algorithm will run in time proportional to $O(n^2)$.

↑ Worst case! (What is the best case?)

How bad is $O(n^2)$, anyway?