$n$

$n$

$n$

$n$

$n$

$O(n^2)$

# 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?)

# Insertion Sort Demo

- Move each element to the left as long as it is less than the previous element.