

**Exercise 2.1.8:** Suppose that we use insertion sort on a randomly ordered array where elements have only one of three values. Is the running time linear, quadratic, or something in between?

**Solution:** Insertion sort running time is linear ONLY when array is already sorted. This is because it does only  $N - 1$  comparisons with no swaps since the array is already sorted. For any other case, it runs on worst case of  $O(N^2)$  complexity.