2) (5 pts) ALG (Sorting)

Quick Sort is not a stable sort. This means that if there are two elements in the input array, a[i] and a[j], are considered equal before the sort is executed with i < j, the element originally stored in a[j] may appear *before* the element originally stored in a[i], after the sort completes. Namely, the relative order of equivalent elements may not be maintained in the sort. (For example, if we are sorting only by last name and in the original list "Doug Adams" appeared before "Sandy Adams", then after the sort, it's possible that "Sandy Adams" could appear before "Doug Adams".)

The reason this is the case is due to the partition function used in Quick Sort. Explain why the partition function doesn't maintain the stability property mentioned above and provide a specific example where stability isn't maintained. In your example, you can use letters with subscripts and sort the letters in alphabetical order.