

CSE143 Lecture Questions for Monday, 5/10/21

Question	Answer
Will it ever be the case that at the end of the partition index2 is less than index1 but there's a gap in between?	No, there is no way for that to happen. In the if/else in the loop, the first two cases change index1 and index2 by just 1 and in the second case, the two values being swapped are different, so that can't lead to a gap opening up between index1 and index2.
I'm kind of confused about why picking the first value as the pivot can turn into an $O(n^2)$. Is it because each time you go through the sort method the partition picks off only one value at a time and then you need to partition it all over again on the order of n ?	You have it mostly right. Think about why merge sort behaves well. Each time it divides a list into two halves. That leads to $\log(n)$ number of splits necessary. With quicksort, if you only split off one value each time, then it will take n different times to complete the process. That's what causes it to be like the classic $O(n^2)$ algorithms.