Let n be the count of numbers in a collection of base10 numbers. Suppose zero is the minimum number and k is the maximum number in the collection. The time complexity of counting sort is

This is off the top of my head...

You have to process the array of n numbers, so that takes theta(n) time. Then you have to process the counts array, which takes theta(k) time. The overall time depends on which is bigger, n or k.

Thank you!