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Advanced Algorithms

2.9

1. So the assumptions I will make to start are:

a. each card has 80 columns as said

b. A card sorter has 2000 cards/min

c. We are sorting 20 columns for each card

d. We go in ascending order

e. We have 13 buckets to put them in (one for each digit possible + blank).

f. An example card of 20 digits (columns) would look like: 0123456789xy3456789

The radix sort process is fairly simple, we look at each digit starting right to left and create buckets of similar numbers that we can then continue to sort moving in digits to the left. We have 10,000 cards and for each iteration of “radix-sort” we need to sort all 10,000 cards for 1 column. If that takes 2000 cards per minute, then we can sort 1 column (of the 20 required ) in 5 minutes. Therefore, to sort all cards while stopping in between each column, this would take 100 minutes (20 columns \* 5 min/column). I made the assumption that in order to sort 1 column, we need to sort a whole card (this is seen in assumption b).