1. Show that any comparison-based algorithm to sort 4 elements requires at least 5 comparisons in the worst case.

2.

Explain how RadixSort can be used to sort the following $S = \{125, 27, 729, 1, 27, 8, 64, 343, 216\}$

using radix = 9.

3. Carry out the steps of RadixSort to sort the following $\{80, 27, 72, 1, 27, 8, 64, 34, 16\}$ – Hint: use 9 for your radix.