

Lab W2D2

Question 1. Practice Radix Sort

Repeat what I have done in Slides 24 and 25. Let Radix be 9. Array to be sorted is {179, 721, 639, 549, 292, 427, 335, 435, 62}.

Question 2. Experimenting with lower bound

Devise an algorithm to sort 4 elements using exactly 5 comparisons in the worst case. Does this violate the theoretical lower bound? Justify your answer.

Question 3. Exploring new ideas: Forward and backward sorted array (FBS array)

Definition

An array is said to be a FBS array if it satisfies the following three conditions.

- (1) Elements in the odd locations are sorted in the ascending order.
- (2) Elements in the even locations are sorted in the descending order.
- (3) Every element in the odd locations are \leq every element in the even locations.

Example {7, 20, 10, 19, 10, 17, 14, 15, 15}

Devise an algorithm to FBSsort (that will make an array a FBS array). What is the asymptotic running time of your algorithm? What is the fastest possible asymptotic running time for such an algorithm? Prove your answer.