Lab W1D5

Question 1. Goal of this question is to understand inversions.

In Slide 13 (Lesson 4), you have been introduced to inversions. In fact it has the following example.

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Example. The array arr = {34,8,64,51,32,21} has nine inversions:

(34,8),(34,32),(34,21),(64,51),(64,32),

(64,21),(51,32),(51,21),(32,21).

Apply Bubble Sort on array arr. List all inversions and the number of inversions **after each iteration of the outer loop. (Please complete the table. Add/delete rows as required.)**

Iteration	inversions	# inversions
0	(34,8), (34,32), (34,21), (64,51), (64,32), (64,21), (51,32), (51,21), (32,21).	9

Total number of inversions for Bubble Sort =

Apply Selection Sort on array arr. List all inversions and the number of inversions **after each iteration of the outer loop. (Please complete the table. Add/delete rows as required.)**

Iteration	inversions	# inversions
0	(34,8), (34,32), (34,21), (64,51), (64,32), (64,21), (51,32), (51,21), (32,21).	9

Total number of inversions for Selection Sort =

Apply Insertion Sort on array arr. List all inversions and the number of inversions **after each iteration of the outer loop. (Please complete the table. Add/delete rows as required.)**

Iteration	inversions	# inversions
0	(34,8), (34,32), (34,21), (64,51), (64,32), (64,21), (51,32), (51,21), (32,21).	9

Total number of inversions for Insertion Sort =

Question 2. Aim of this question is to understand amortized cost analysis.

Consider the following sequence of operations:

add, add, add, add, clear, add, add, add, add, add, add, clear, add, add, add, add, clear, add, add, add, add, add, add, add, add, clear.

    (a) What is the actual total cost?
    (b) What is the average actual cost?
    (c) What is the amortized total cost?
    (d) What is the average amortized cost?