ASSIGNMENT-13

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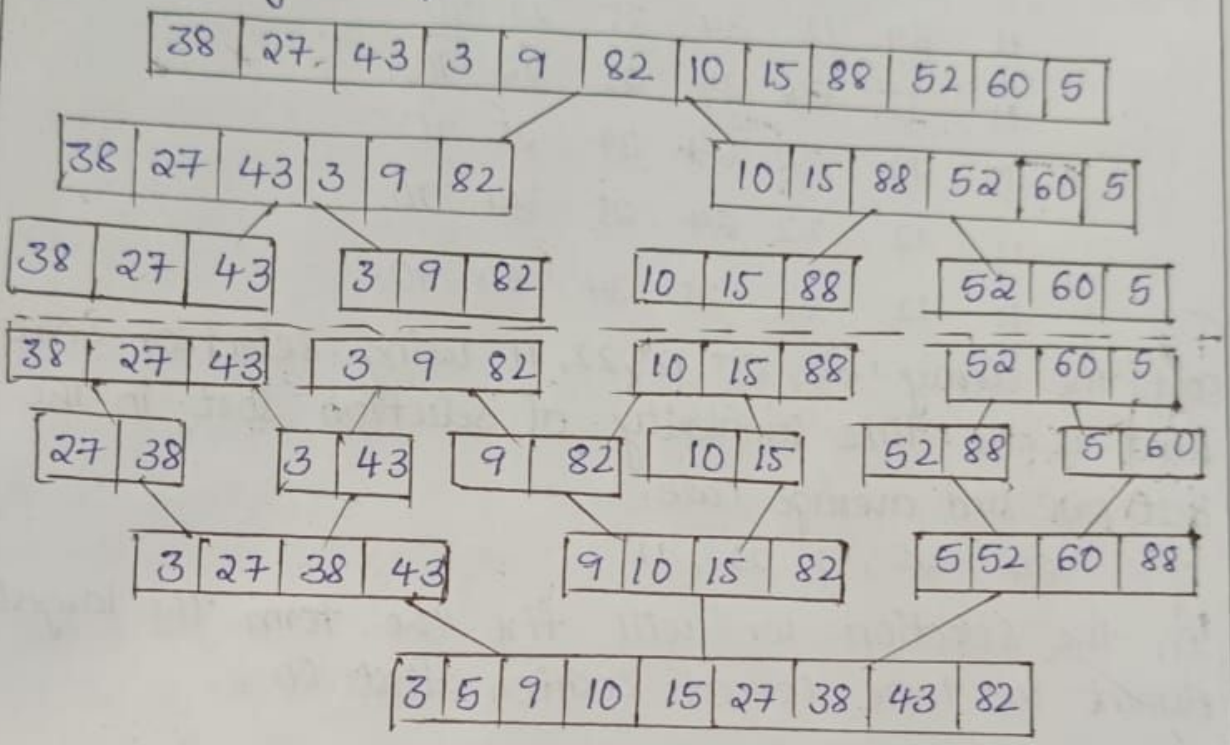
1. Sort the following elements using merge sort divide and conquer stage by [38, 27, 43, 3, 9, 82, 10, 15, 88, 52, 60, 5] using and analyze time complexity of the algorithm.

A: Given array : Merge sort



∴ Sorted list : [3, 5, 9, 10, 15, 27, 38, 43, 52, 60, 82, 88]

Time Complexity : O(n)

2. Sort the array by 64 34 25 12 22 11 90 using buble sort what is time complexity of selection sort in the best worst and average case.

A: Given array = 64 34 25 12 22 11 90

In bubble sort we bring from smallest element in there correct position continue this until each element Reach there.

correct position :

64 34 25 12 11 22 90

64 34 25 11 12 22 90

64 34 11 25 12 22 90.
64 11 34 25 12 22 90
11 64 34 25 12 22 90
11 64 34 12 25 22 90
11 64 12 34 25 22 90
11 12 64 34 25 22 90
11 12 22 64 34 25 90
11 12 22 64 25 34 90
11 12 22 25 34 64 90.

3. Sort the array 64, 25, 12, 22, 11 using selection sort what is the time complexity of selection sort in the best case and average case.

A: 64, 25, 12, 22, 11.

In the selection we will fix the form the largest element in there correct position first so.

25 64 12 22 11
25 12 64 22 11
25 12 22 64 11
25 12 22 11 64
12 25 22 11 64
12 22 25 11 64
12 22 11 25 64
12 11 22 25 64
11 12 22 25 64.

The sorted list is 11, 12, 22, 25, 64

Best case = $O(n^2)$
Average case = $O(n^2)$
worst case = $O(n^2)$

4. given an array of [4,-2,-5,3,10,-5,28,-3,6,7,-4,1,9,-1,0,-6,-8,11,-9] integers sort the following elements using insertion sort using Brute force algorithm strategy analyze time complexity.

A: Given array is 4,-2,5,3,10,-5,2,8,-3,6,7,-4,1,9,-1,0,-6,-8,11,-9]

insert 4,-2.

-2 4

insert 5

-2 4 5

insert 3,-10,-2,2

-5,-2,2,3,4,5,10

insert 8,-3,6,7

-5,-3,-2,2,3,4,5,6,7,8.

insert -4,-7

-5 -4 -3 -2 0 1 2 3 4 5 6 7 8 10.

insert 9,-1

-5,-4,-3,-2,-1,0,1,2,3,4,5,6,7,8,9,10

insert 0.

-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

insert -6

-6 -5 -4 -3, -2 -1 0 1 2 3 4 5 6 7 8 9 10

insert -8.

-8,-6,-5,-4,-3,-2,-1,0,1,2,3,4,5,6,7,8,9,10

insert 11

-8,-6,-5,-4,-3,-2,-1,0,1,2,3,4,5,6,7,8,9,10

insert -9

-9,-8,-6,-5,-4,-3,-2,-1,0,1,2,3,4,5,6,7,8,9,10

insert -9

-9 -8 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9

10 11

5 Sort the following elements using insertion sort using Brute force approach [38, 27, 43, 3, 9, 82, 10, 15, 88, 52, 60, 5] and analyze complexity of the algorithm.

A:

Insert	38, 27	27 38.
Insert	43	27 38 43
Insert	3	3 27 38 43
Insert	9	3 9 27 38 43
Insert	82	3 9 27 38 43 82
Insert	10	3 9 10 27 38 43 82
Insert	15	3 9 10 15 27 38 43 82
Insert	88	3 9 10 15 27 38 43 82 88.
Insert	52	3 9 10 15 27 38 43 52 82 88
Insert	60	3 9 10 15 27 38 43 52 60 82 88
Insert	5	3 5 9 10 15 27 38 43 52 60 82 88

Time complexity : Best case. : $O(n)$

Average case : $O(n^2)$

worst case : $O(n^2)$