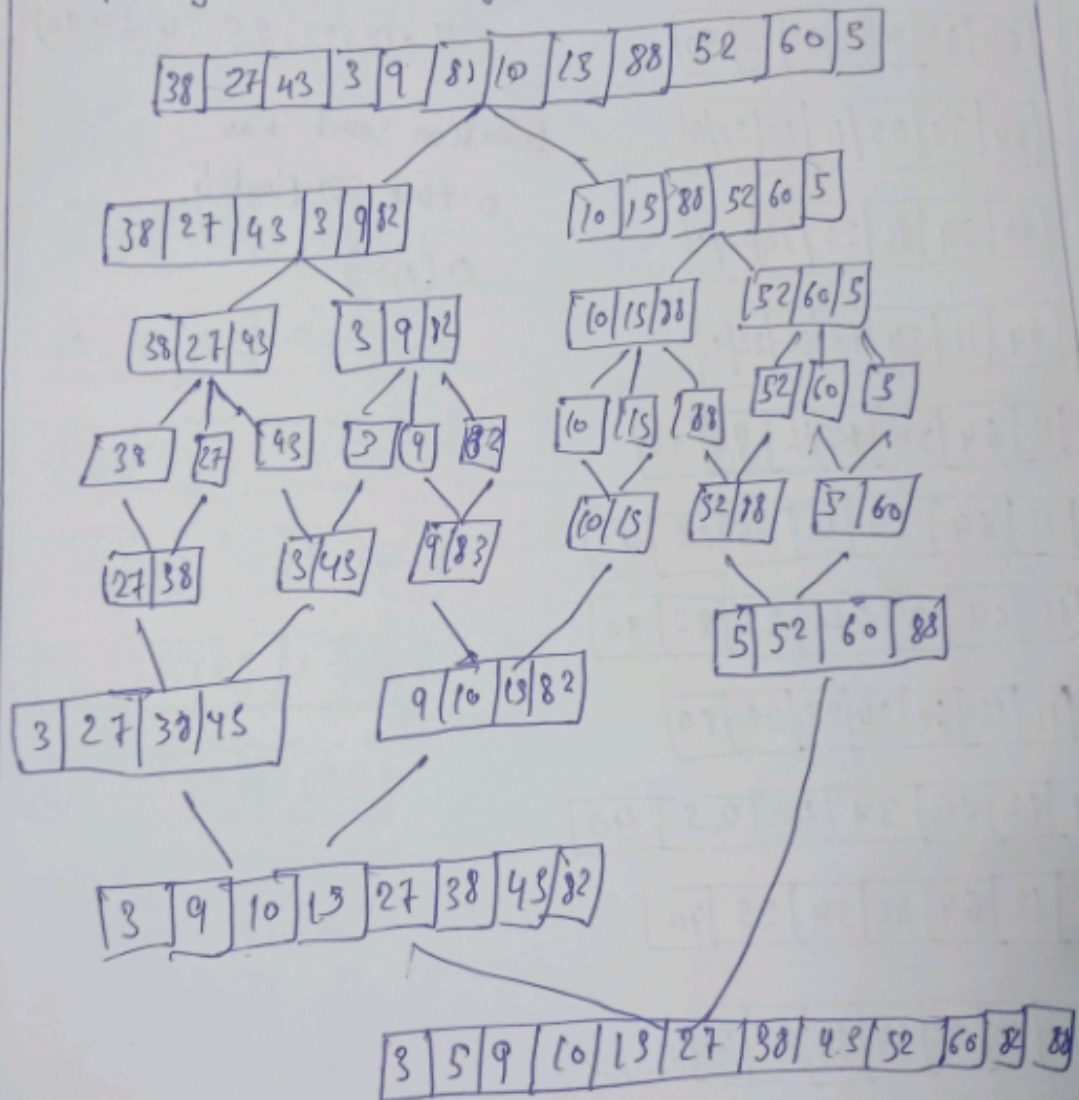


Assignment 13 (24-6-24)

1. Sort the following elements using merge sort divide and conquer [38, 27, 43, 3, 9, 87, 10, 15, 88, 52, 60, 5] using and analyse Time complexity of the algorithm?



Time complexity = $O(n^2)$

2

Sort the array 64, 34, 25, 12, 22, 11, 90, using bubble sort. What is the time complexity of solution sort in best, worst and average case.

given array

(11, 12, 22, 25, 34, 64, 90)

Selection sort has
time complexity

$O(n^2)$

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

3.

Sort the array 64, 25, 12, 22, 11 using selection sort. What is time complexity of selection sort.

64 25 12 22 11

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

11 12 22 25 64

Sort List is 11, 12, 22, 25, 64

Time Complexity = $O(n^2)$

Best case: $O(n^2)$

Average case: $O(n^2)$

Worst case: $O(n^2)$

4. Given array of $[-4, 1, 9, -1, 0, -6, 5, 11, -9]$ integer sort the following element using insertion sort using Brute force algorithm strategy analyze the complexity.

[4]

[-2 4]

[-2 4 5]

[-2 4 5]

[-2 3 4 5 10]

[-5 -2 3 4 5 10]

[-5 -2 2 3 4 5 10]

[-5 -3 -2 2 3 4 5 8 10]

[-5 -3 -2 2 3 4 5 6 8 10]

[-5 -4 -3 -2 2 3 4 5 6 7 8 10]

[-5 -4 -3 -2 1 2 3 4 5 6 7 8 10]

[-5 -4 -3 -2 1 2 3 4 5 6 7 8 9 10]

[-5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10]

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

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

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

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

Time complexity

Best case $O(n)$

Average case $O(n^2)$

Worst case $O(n^2)$

Sort the following elements using insertion sort

using Insertion Sort using Route force

[38, 27, 43, 3, 9, 82, 10, 15, 88, 52, 60, 5]

and analyse complexity of algorithm

give array = [38, 27, 43, 3, 9, 82, 10, 15, 88, 52, 60, 5]

[38]

[~~38~~] [27 38]

[27 38] [~~43~~]

[3 27 38 43]

[3 9 27 38 43 82]

[3 9 27 38 43 82 88]

[3 9 10 15 27 38 43 52 82 88]

[5 9 10 15 27 38 43 52 60 82 88]

[3 5 9 10 15 27 38 43 52 60 82 88]

[3 5 9 10 15 27 38 43 52 60 82 88]

Time Complexity $O(n^2)$

Best case - $O(n)$

Worst case - $O(n^2)$

Average case - $O(n^2)$