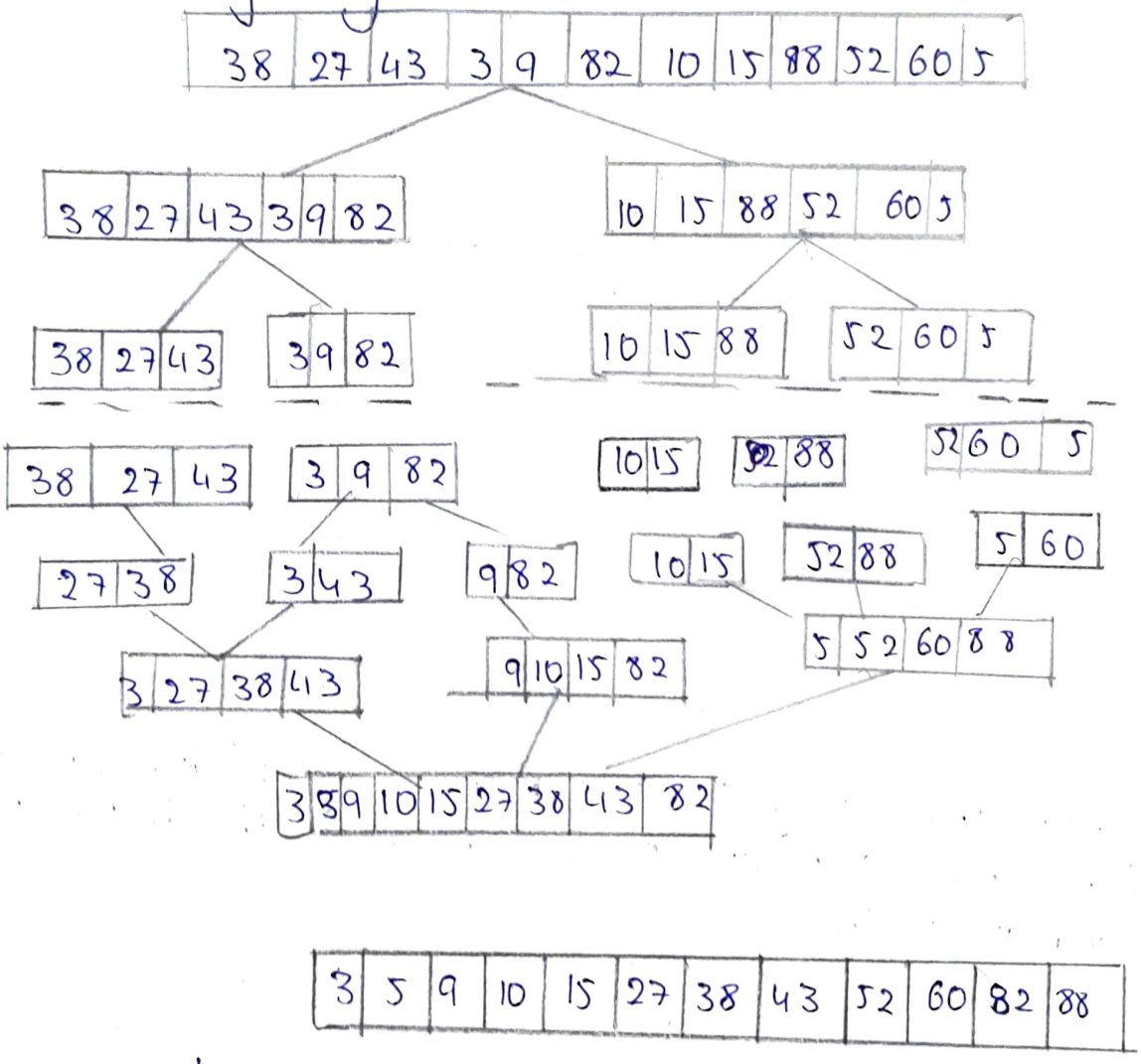
16. Sort the following elements using merge sort divide and Conquer stage by [38,27,43,3,9,82,10,15,88,52,60,5] using and analyze time Complexity of the algorithm

A. Given array: merge sort



∴ sorted list: (3,5,9,10,15,27 38 43 52,60,82,88)

Time Complexity: O(n)

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

A. Given array: 64 34 25 12 2211 90

In bubble sort we bring from smalest 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 64 34 22 25 90

11 12 64 22 34 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

Q8. Sort the array 64, 25, 12, 22, 11 using selection sort. what is the time complexity of selection sort in the best worst and average cases?

A 64 25 12 22 11

In the selection we will fix that from 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.

Time complexity: selection sort is an another simple comparison sorted algorithm.

Best case: $O(n^2)$

Average case: $O(n^2)$

worst case = $O(n^2)$

19. Given an array of [4,-2,-5 3,10 -5,2 8,-3,6 7,-4 1,9,-1,0-6,-8 1,-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,-8,1

insert 4,-2

-2 4

Insert 5

-2 4 5

Insert 3

-2 3 4 5

Insert -10

-2 3 4 5 10

Insert -5

-5 -2 3 4 5 10

Insert 2

-5 -2 2 3 4 5 10

Insert 8

-5 -2 2 3 4 5 8 10

Insert -3

-5 -3 -2 2 3 4 5 8 10

Insert 6

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

Insert 7

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

Insert-4

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

Insert 1

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

Insert 9

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

Insert -1

-5 -4 -3 -2 -1 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 11

Insert -9

-9 -8 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11

20. 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 83 88

Insert 88 — 3 9 10 15 27 38 43 82 83 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 : $O(n^2)$