26 September 2023 19:37

# Insertion Sort :-

lst = [12, 31, 25, 8, 32, 17]

Working :-

[12, 31, 25, 8, 32, 17]

12 < 31 ✓ 31 < 25 X

12 < 25 ✓

[12, 25, 31, 8, 32, 17]

31 < 8 X

[12, 25, 8, 31, 32, 17]

25 < 8 X

[12, 8, 25, 31, 32, 17]

12 < 8 X [8, 12, 25, 31, 32, 17]

[8, 12, 25, 31, 32, 17] 32 < 17 X

[8, 12, 25, 31, 17, 32]

[8, 12, 25, 31, 17, 32)

[8, 12, 25, 17, 31, 32)

[8, 12, 17, 25, 31, 32)

1. Merge Sort
2. Quick Sort
3. Bucket Sort.

# (1) Quick Sort :-

eg:- lst = [24, 9, 29, 14, 19, 27]

Task is to sort the list.

Soln :- [24, 9, 29, 14, 19, 27]
(indices: 0, 1, 2, 3, 4, 5)

left = 0
right = 5

pivot = 0 (Assume)

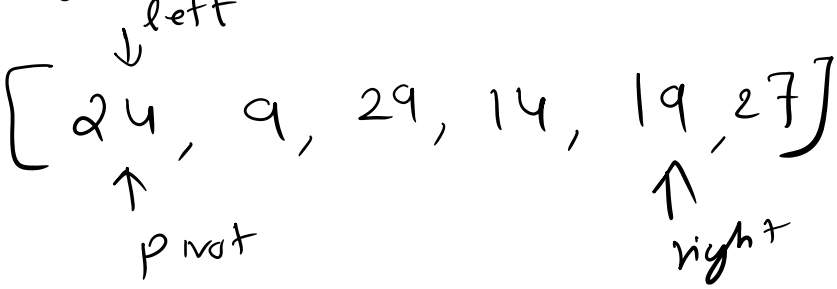
lst[left] = 24, lst[right] = 27, lst[pivot] = 24

Since, the pivot is at the left, so the algorithm starts from right & move towards left.

Now, lst[pivot] < lst[right]

24 < 27 ✓

the algorithm moves the right to the next value




lst[l] = 24 lst[p] = 24 & lst[r] = 19

lst[l] = 24 lst[p] = 24 & lst[r] = 19

Now, lst[p] > lst[r]

24 > 19

The algorithm swaps the values.

↓ pivot.

[19, 9, 29, 14, 24, 27]

↑ left ↑ right

lst[l] = 19, l[right] = 24 & l[p] = 24

l[p] > l[left]

24 > 19

↓ p

[19, 9, 29, 14, 24, 27]

↑ l ↑ r

l[p] < l[l] Swap

↓ p

[19, 9, 24, 14, 29, 27]

↑ l ↑ r

p = 24 & r = 29 24 < 29 ✓

24 > 14 → Swap

↓ p

[19, 9, 14, 24, 29, 27]

↑ l ↑ r

[24, 9, 29, 14, 19, 27] ← l[left] = 24, l[right] = 27, l[pivot] = 24 [Assumption]

24 < 27 ✓

24 < 19 ✗ [19, 9, 29, 14, 24, 27]

19 < 24 ✓

9 < 24 ✓

29 < 24 ✗

[19, 9, 24, 14, 29, 27]

24 < 29 ✓

24 < 14 ✗ [19, 9, 14, 24, 29, 27]

14 < 24 ✓

Bucket Sort:- min = 1 max = 23

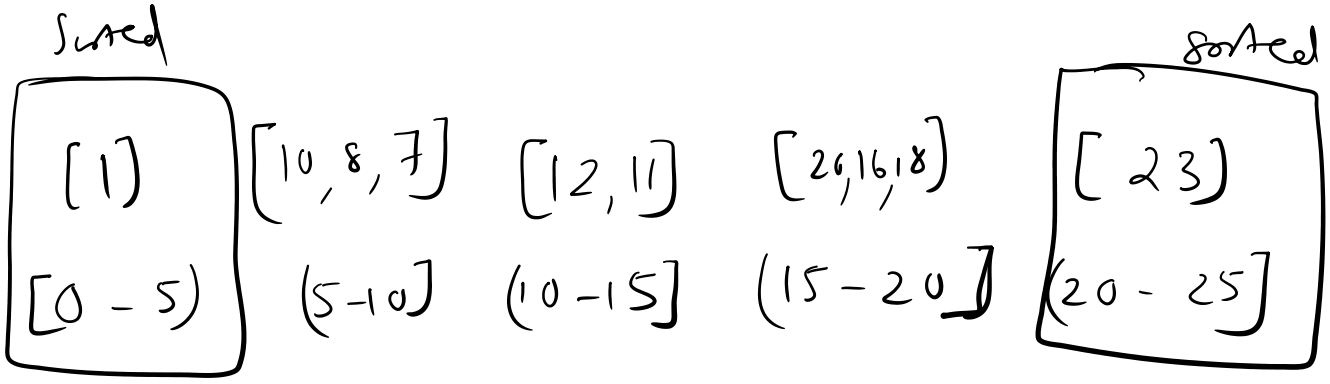
eg: list = [10, 8, 20, 7, 16, 18, 12, 1, 23, 11]

① 0-5, 5-10, 10-15, 15-20, 20-25

② 0-3, 3-6, 6-9, 9-12, 12-15, 15-18 .....

$\frac{max - min}{len}$

$\frac{23-1}{10} = \frac{22}{10} = 2.2$




[1] [7,8,10] [11,12] [16,18,20] [23]

[0-5] (5-10] (10-15] (15-20] (20-25]

[1, 7, 8, 10, 11, 12, 16, 18, 20, 23]