Class 14

Sunday, December 6, 2020 9:47 PM

Sorting

N = size of array

- $O(N^2)$
  - Bubble Sort
  - Insertion Sort
  - Selection Sort
- $O(N \log N)$
  - Merge Sort
  - Quick Sort
- $O(MAX - MIN + N)$
  - Counting Sort

Inversion Count = 6

A[] → 4 3 2 1 → n

$A_i > A_j$, $i < j$

max → $\frac{n(n-1)}{2}$

min → 0

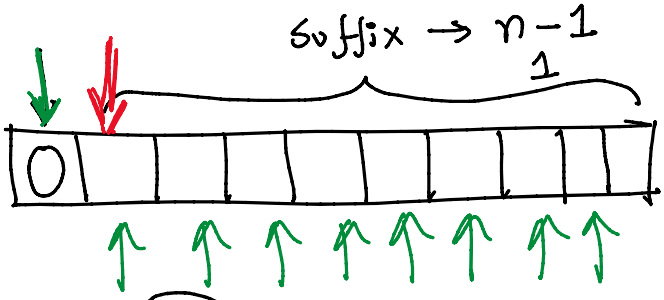
4 3 3 2 2 1

4 2 3 1

4 1

① Bubble Sort: $O(N^2)$

1 2 2 5 6 8



$N \cdot \frac{N}{2} = \frac{N^2}{2} \rightarrow O(N^2)$

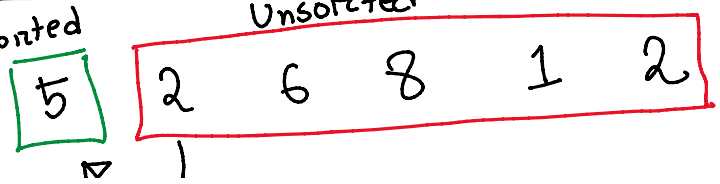
3 1 2

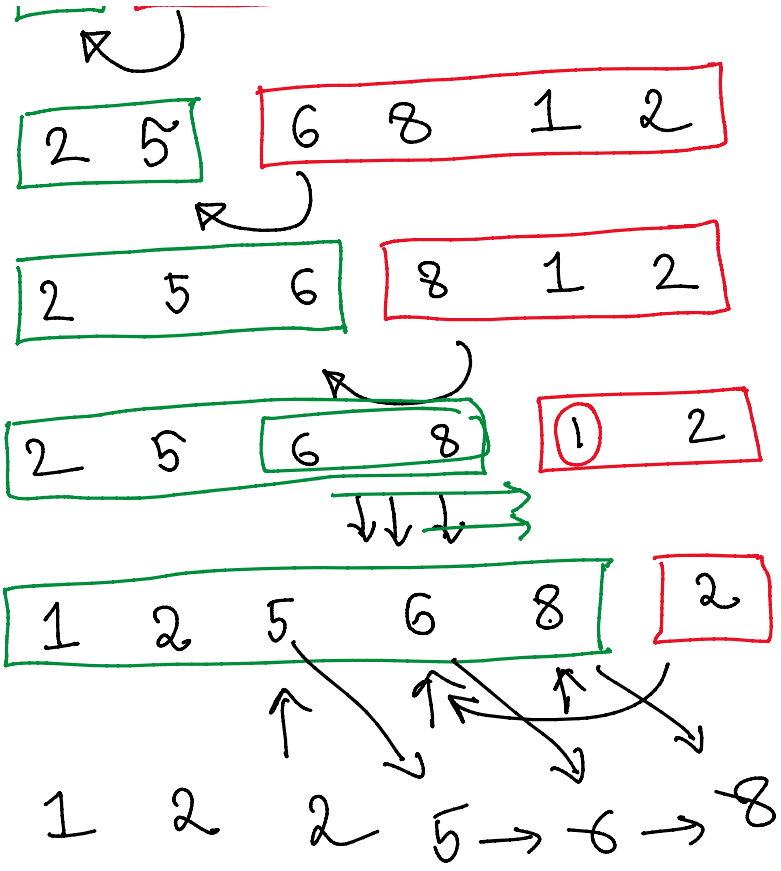
$vc_i > vc_j$

i j

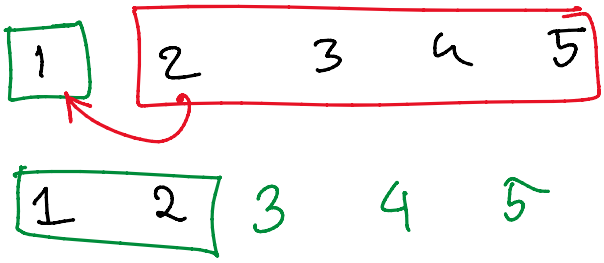
—o—

② Insertion Sort:





key = 1



0 — 1

first_lady = LB - 1

second_lady = UB

1 5 5 6 7 8

a_0 a_1 a_2 a_3 a_4

1 3 5 6 8

LB == 0 → X

④

LB == 0 → X

UB == N → X