

vec → 1 1 2 2 2 5 6 6

↓

vec2 → 1 2

— • —

Sorting

*) Sleep / Lazy sort

5	1	7	0	2	4	3
5ms	1ms	7ms	0ms	2ms	4ms	3ms

0 1 2 3 4 5 7

*) Bogus Sort

$N \rightarrow N! \rightarrow O(N \cdot N!)$

*) Bubble Sort

⑦ [5 1 0 2 11 9 6]

(N-1) 0 [5 1 2 11 9 6]

(N-2) 0 1 [5 2 11 9 6]

(N-3) 0 1 2 [5 11 9 6]

0 1 2 5 [11 9 6]

⋮
⋮ 0 1 2 5 6 [11 9]

① 0 1 2 5 6 9 [11]

② 0 1 2 5 6 9 11

$$\underbrace{N + (N-1) + (N-2) + \dots + 1}_{\checkmark} = \boxed{\frac{N(N+1)}{2}} = \frac{N^2 + N}{2}$$

$$\approx N^2 + N$$

— o —

$$\approx N^2$$

$$\approx O(N^2)$$

for (i = 0; i < N; i++)

for (j = i + 1; j < N; j++)

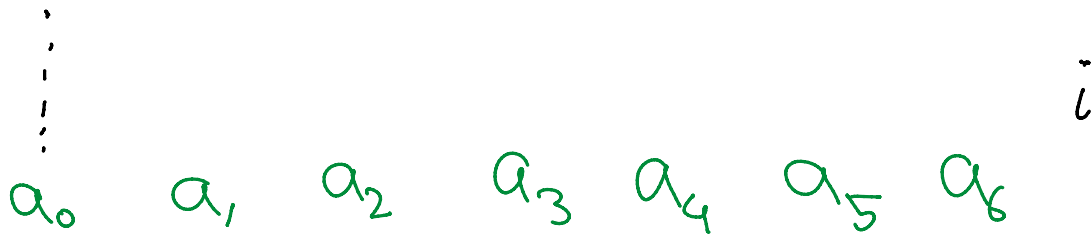
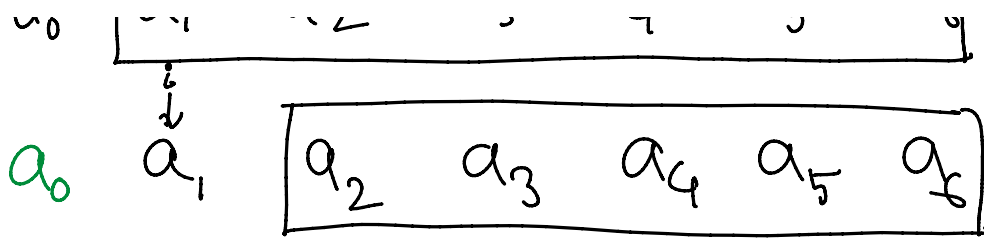
if (arr[i] > arr[j])

swap(arr[i], arr[j]);

i
↓
a₀

a₁ a₂ a₃ a₄ a₅ a₆

i



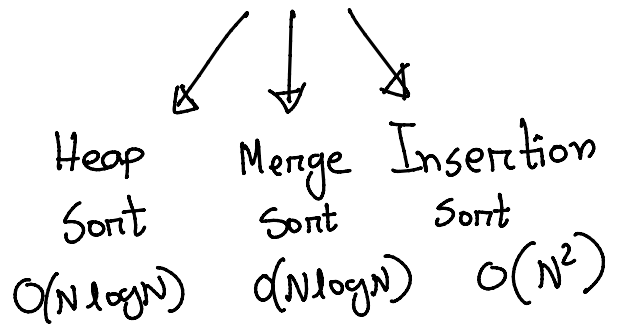
\rightarrow $O(N \log N)$

Built in sort function \rightarrow Intro Sort (Hybrid)

$N < 15$

1.5 ms

1 ms



\rightarrow

Insertion Sort:

1 2 3 5 4 6

$O(KN)$

1 2 3 4 5 6 10 12

1 2 3 4 5 6 10 12