Home work → ① [n-i] i=0 → < n-1

j = ?

↳ Dry Run

② → stable or unstable — ?

③ → In-place sort ?

Round i : 1st largest

↳ Right place

④ How → Like GFG

↳ Quiz of Bubble sort

↓

Solve

In

description

① Because If mostly we see always n = starting loop at zero index to the less than n index.

→ But in Bubble sort, we need to check (0 to n-1) because we will compare the elements at current to the next element that's why last element are not needed to ~~check~~ use the loop it makes as an sorted portion from right side to left after the 1st loop.

→ 2nd loop we used as 0 to (n-i-1) because every round ending index are keep lessing that's why needs to the ~~first~~ ~~not~~ 's logic ~~and also~~. The loop range ~~to~~ from for 1st loop 0 to (n-1) & 2nd loop 0 to (n-i-1) ~~start~~. also in 2nd program 1st loop (for n & 2nd 0 to (n-i) are works as same because ~~use~~ due to changes the index position at starting 1st loop.

→ See Dry Run for detail.

0	1	2	3	4	5
1	7	6	10	9	14

i = 0 to (n-1)
j = 0 to (n-i-1)

i = 0, j = 0

1	7	6	10	9	14

(no swap)

i = 0, j = 1

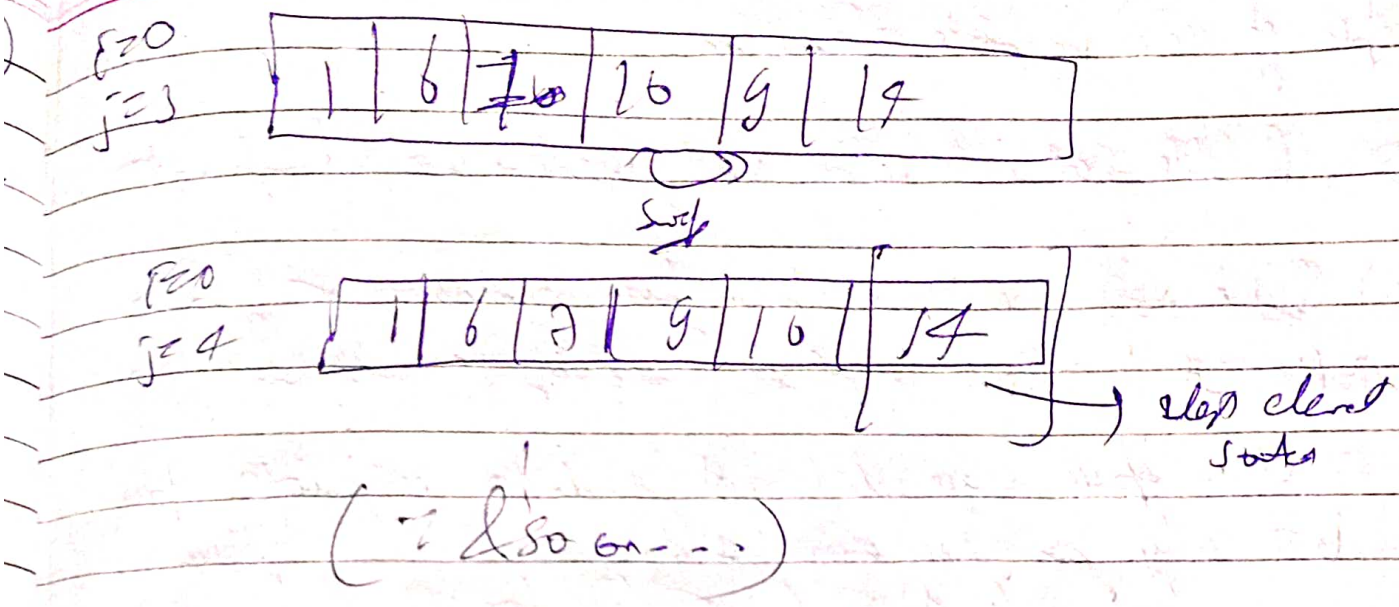
1	7	6	10	9	14

(swap)

i = 0, j = 2

1	6	7	10	9	14

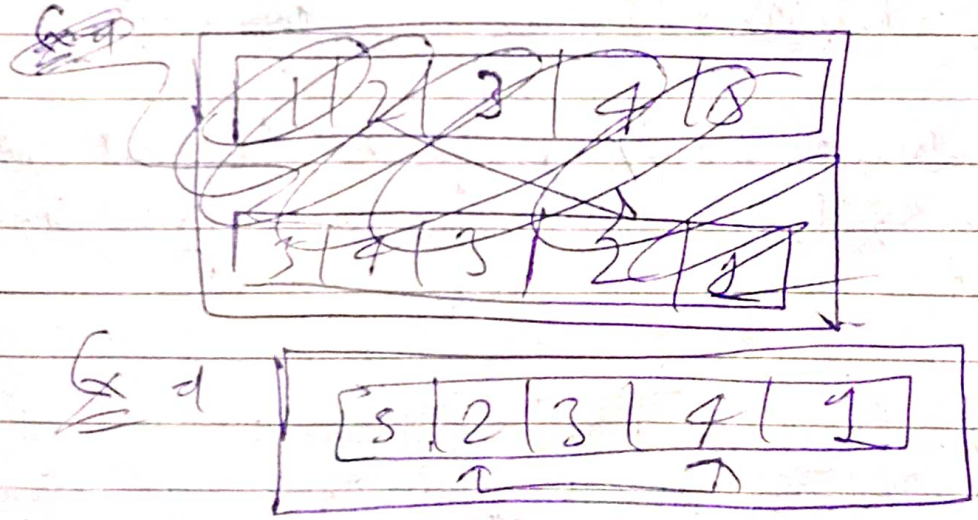
(swap)



(∴ & so on - - -)

(2) Bubble sort is stable due to usage of adjacent elements swapping.

(3) In-place sort ⇒ It is an algorithm that does not need an extra space and produces an output in the same memory that contains the data by transforming the input 'in-place'. However, a small constant extra space used for variables is allocated.



→ It takes O(1) extra space for exchanging & is an exa-

mple of an in-place algorithm.

Ex: Bubble Sort, Selection Sort, Insertion Sort, Heap Sort

→ Quick Sort uses extra space for recursive ~~call~~ function calls. It is called in-place according to broad definition as extra space required is not used to manipulate input, but only for recursive calls.

$O(1) \leq SS \leq O(\log N)$ (provides o/p in same memory as I/p)

(4) GFG Quiz →

i) What is the best time complexity of bubble sort?

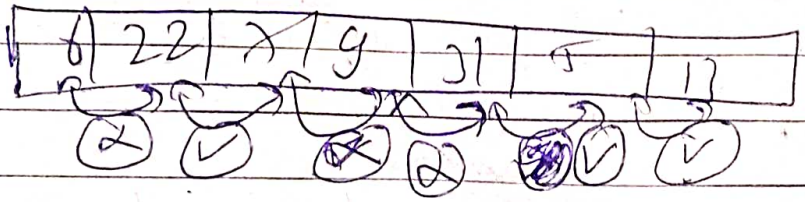
Ans. N ($\because \alpha N$)

ii) Assume that we use Bubble Sort to sort n distinct elements in ascending order. When does the best case of Bubble sort occur?

Ex When elements are sorted in ascending order.

iii) The number of swappings needed to sort the numbers 6, 22, 7, 9, 31, 5, 13 in ascending order, using bubble sort is

Ex



Date
Page

After sorting

| 6 | 7 | 22 | 9 | 5 | 13 | 31 |

(2)

| 6 | 7 | 22 | 9 | 5 | 13 | 31 |

| 6 | 7 | 9 | 22 | 5 | 13 | 31 |

| 6 | 7 | 9 | 5 | 22 | 13 | 31 |

| 6 | 7 | 9 | 5 | 13 | 22 | 31 |

(3)

| 6 | 7 | 9 | 5 | 13 | 22 | 31 |

| 6 | 7 | 5 | 9 | 13 | 22 | 31 |

(4)

| 6 | 7 | 5 | 9 | 13 | 22 | 31 |

| 6 | 5 | 7 | 13 | 22 | 31 |

(5)

| 5 | 6 | 7 | 13 | 22 | 31 |

(∵ two guys copied)

Ex 10