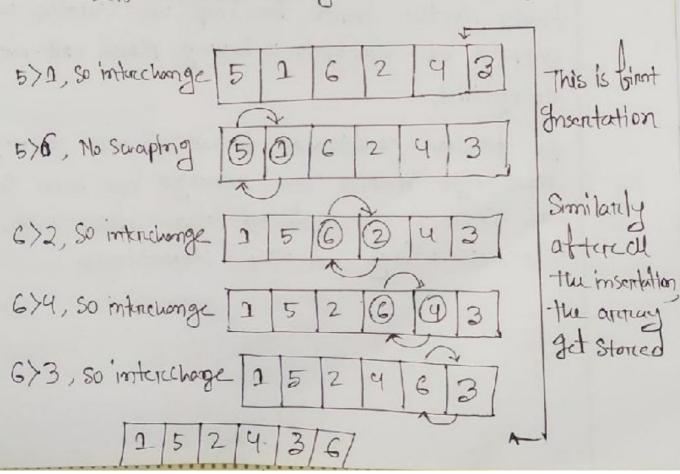
田 Amplementing Bubble Sort Algorithm

Districting with the first element (Index=0), compare the connect element with the next element of the array.

2) If the current element is greater than the next element of the acred, swap them.

3) gt the current element is less than the next element, Repeat Step 1.

Lets Comidere array with Values {5,1,6,2,4,3}



So on we can see trapportation above, after the first Heration, G is placed at the last index, which is the connect position of it Similarly after the second Hereation, 5 will be at the second cast index, and so on.

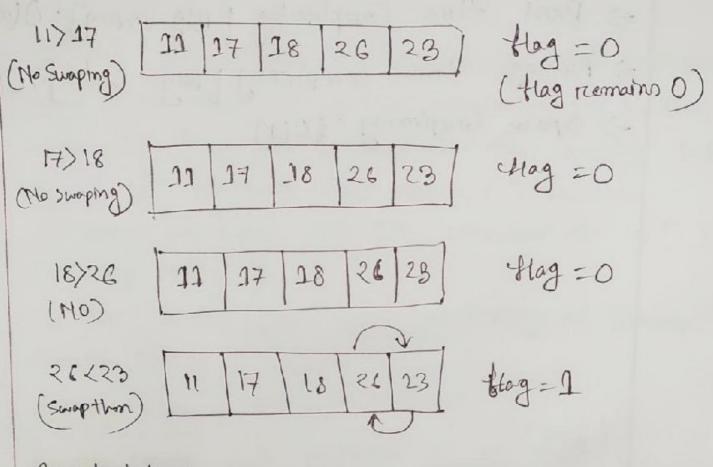
Optimized The Bubble Sout Algorithm o

We can indicate flag to monitore wheather elements are getting swapped inside the inner for loop.

Hence, in the Inner for loop, we cheach wheather swaping of elements is taking place and not, everytime.

gt for a particular iteration, no swaping took place gt means the arrays has been Sortidans we can sumpout at the fore loop, insted the executing who the iterations.

Lets conside any array with values \$11,17,18,16,233



Complexidyo

I bubble sort, n-1 Comparcison will be done in the 1st pass, n-2 in 2nd pass, n-3 in 3rd pass and so on. So the total number of comparcison will be,

output: (m-1) + (m-2) + (m-3) + -- + 3 + 2 + 1Sum = n (m-1) / 2i.e $O(m^2)$ Henc Time Complexity of bulbble Short is Old)

- > Warest time Complexicity [Big-0]: O(m)
- -> Best time Complexity [Big-omeg]: O(n)
- -> Avarage + time (omplexity [Big-theta]:0(n2)
- -> space complexity: 60(2)

Linear Search

Word Case ?

In the linear Scarch, the World come happens when the element to be scarched (in the abobe (ode) is not present in the armay. When IL is not present, the search () function compatus it with all the element of a [] one by one.

So the wordt case time complexity of linear reach would be O(n).

Avariage Conco

For the I'may Scach problem, assume that the of casons are unfortunately disturbed. So we sum all the cases and devided the sum by (n+1). Avarage Care time = Entl 00) (nti)

= (m1)*(m2)/2)

= 0(m)

Bost Cone : Merge Sort does O(nlong)
operations in all corros.

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