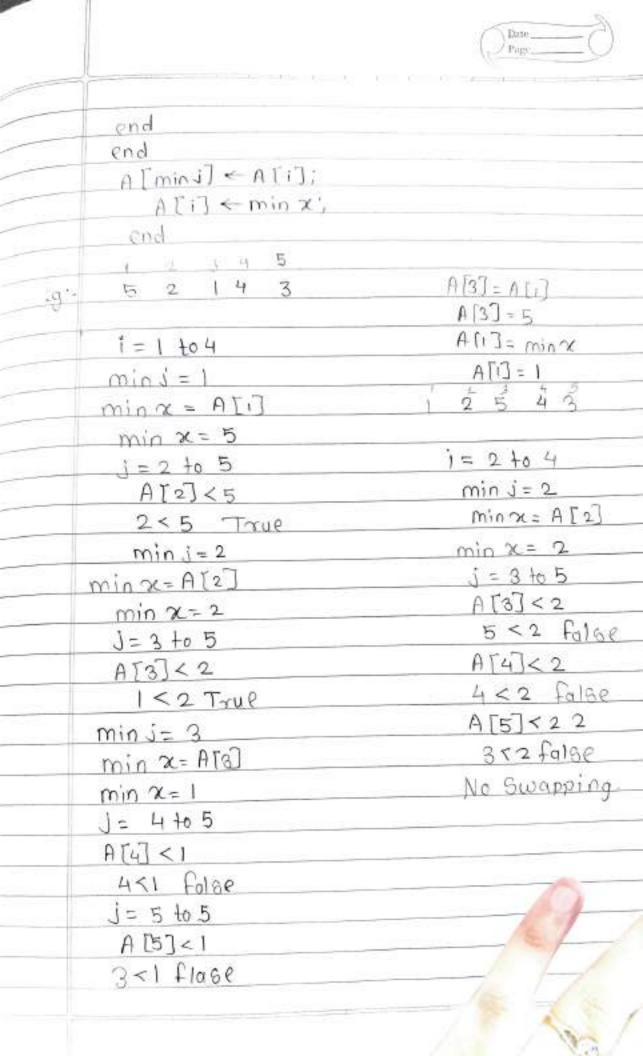
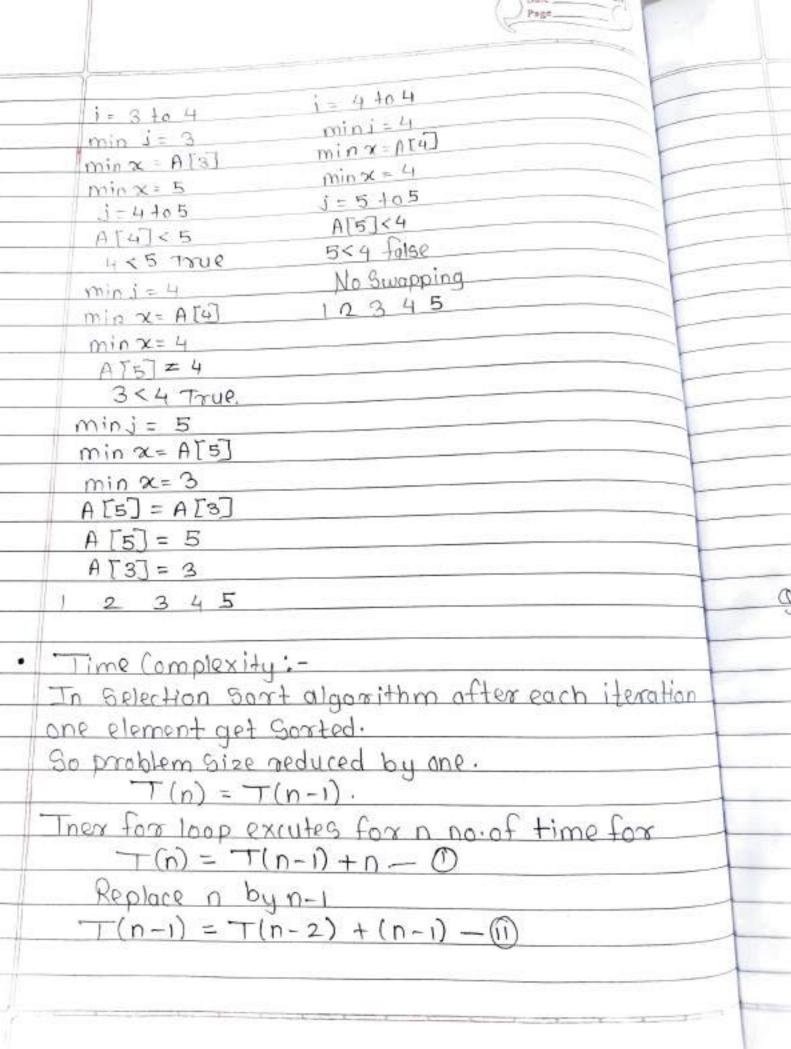
X Selection Sout Algorithm: & Scan the array and the find the Smallest - Clement Swapping with Lizzt element C. Starting from the and element Scan the array to find the simallest element swapping with and element. This process is repeated until least is gorfed. 10.30.20,50,60,10,40 20 10,20,30,50,60,70,40 10,20,30,40,60,70,50 10,20,30,40,50,70,60 10,20,30,40,50,60,70 · Algorithm . for J=1 to n-1 do min j ← i; $\min x \leftarrow A[i]$ for j= itito ndo if A[i] < min x then minx < j; $min \propto \leftarrow A[i]$

Plage_







put
$$T(n-1)$$
 in eyr 0
 $T(n) = (T(n-2) + (n-1) + n - 60)$

Replace n by $n-2$ in eqn 0 at n by $n-1$

in eqn 0

$$T(n-2) = T(n-3) + (n-2)$$

sut $T(n-2)$ in eqn 0

$$T(n) = T(n-3) + (n-2) + (n-1) + n$$

$$T(n) = T(n-k) + (n-k+1) + (n-k+2) + \cdots + n$$

put $n=k$

$$T(n) = T(0) + 1 + 2 + 3 + \cdots + n$$

$$T(0) = 0$$

$$T(n) = 1 + 2 + 3 + \cdots + n$$

$$= 2n$$

$$= n(n+1)$$

$$2$$

Complexity = $0(n^2)$ [Best, worst & average]

g. $\overline{1}$ Sort the following array by using Selection Sort Algorithm
$$50, 40, 50, 9, 45, 90, 65, 25, 75$$

$$5, 40, 50, 9, 45, 90, 65, 25, 75$$

$$5, 9, 25, 40, 45, 90, 65, 25, 75$$

$$5, 9, 25, 40, 45, 90, 65, 50, 75$$

$$5, 9, 25, 40, 45, 90, 65, 50, 75$$

5,9,25,40,45, 50,65,70,75 5,9,25,40,45,50,65,75,90

9.27 Scan the following ward by using Selection Sort Algorithm. EXAMPLE

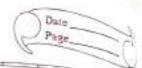
EXAMPLE

	Insertion Sout:		
	30,70 20, 50,40,10,60		
30 70,20,50 40 10 60 Serried Unsorted			
-	gented Unsorted		
	30 70 20 50 40 10 60		
0 1 Unsorted			
20 30 70 50 40 10 60 0 1 2 Unsorted			
	0 1 2 3 unsorted		
7	20 30 40 50 70 10 60		
-	0 1 2 3 4 Unsorted		
	T		
	10 20 30 40 50 70 60		
_	10 20 30 40 50 60 70		
	0 1 2 3 4 5 6		

· Algorithm: for i 2 to A length Key OLil tubile iso and A[i] > key

| N [i+i] = A[i] |
| i=i-1 end A [i+i] = key · example :j = 2 to 5 Key = A[2] = 13 1>0 and 2>13 -- False No Swapping j = 3 to 5 Key = A [3] 1>0 and 13>5 -- True 150 and 2713 false A[3] = A[2] E1 = [E] A 1=1 A[2] = key

A [4] = 14



* 0		1/2
Lind lin	18 Cample xit [1-0 11
	e Complexity of	insertion Sout.

1. Best Case: -

When list is already Sorted, so Condition into while loop is never executed so ti=1

So the recurrence relation is.

$$T(n) = C_1 n + (2(n-1)+C_3\cdot(n-1)+C_4 = 1) + C_4 = 1 + C_4 + C_4$$

$$\frac{s}{j=2} + j = \frac{2}{j=2} - (1+1+---+1) = n-1 \text{ times}$$

$$T(n) = C_{1} \cdot n + C_{2}(n-1) + C_{3}(n-1) + (4(n-1) + C_{5} \times 0 + C_{6} \times 0 + C_{7}(n-1))$$

$$= C_{1} + C_{2} + C_{3} + C_{4} + C_{7} \int_{n} - [C_{2} + C_{3} + C_{4} + C_{7}]$$

$$T(n) = a_{1} - b_{2}$$

2. Worst Case:-

In the worst case Complexity, elements are arranged in reverse order, so the Condition in while loop is executed, so ti=j.

$$\sum_{j=2}^{n} t_j = \sum_{j=2}^{n} j = 2 + 3 + 4 + 4 + \dots + n - 0$$

Add & Sub I in ear O.

$$\leq tj = (1+2+3+---+n)-1$$

= $\leq n-1$
= $n(n+1)-1$

$$\frac{2}{j=2} + \frac{1}{j=2} + \frac{2}{j-1} = \frac{2}{2-1} + \frac{2}{3-1} + \cdots + \frac{2}{3-1} = \frac{2}{3-1} = \frac{2}{3-1} + \cdots + \frac{2}{3-1} = \frac{2}{3-1} + \cdots + \frac{2}{3-1} = \frac{2}{3-1} + \cdots + \frac{2}{3-1} = \frac{2}{3-1} = \frac{2}{3-1} + \cdots + \frac{2}{3-1} = \frac{2}{3-1} =$$

$$= 2n-1$$

- $n(n-1)$

Put Etis Eti-lin pand

$$T(n) = \left(1 n + C_2(n-1) + (3(n-1) + (4(n(n-1)-1) + C_3(n-1)) + C_4(n-1)\right) + C_4(n-1)$$

$$= \frac{C_4 + C_5 + C_6}{2} + \frac{C_6}{2} + \frac{C_1 + C_2 + C_3 + C_4 - C_6}{2} + \frac{C_1 + C_2 + C_3 + C_4}{2} + \frac{C_1 + C_2 + C_3}{2} + \frac{C_1 + C_2 + C_3}{2$$

$$=$$
 $an^2 + bn + C$

Complexity - O(n2)



S. Average Case: -To average case Complexity, Some of the clements are Sorted and remaining elements are unsorted, so ti = i-1

$$\frac{1}{j+1} + j = \frac{1}{j-1} + j - 1 = \frac{1}{2} + \frac{1}{2}$$

$$\frac{y}{j+2} + j = 1 = \frac{2}{j-1} + \frac{j-1}{2} = \frac{2}{2} + \frac{j-3}{2}$$

= n(n-3)

put sti & sti-I in ean 1

$$T(n) = C_1 \cdot n + C_2(n-1) + C_3(n-1) + C_4 \cdot n(n+1) + 2 2$$

$$T(n) = an^2 + bn - C$$

Complexity = $o(n^2)$

X

Sort the following word by using insertion sort