Searching & louting (See so) Linear Search (a, n, x) dement may like of array (lonsrch.c) Binary Search (a, i, j, x) (Recursive)
(binsrch.C)
(binsrch.C) Time Complexity

BEST CASE: Key is present at first index [O(1)]. HORST CASE: Key is present at last index [O(N)]. ANG. CASE: O(N) Advantages not can be used irrespective of whether the array is sorted or > Does NOT require any additional memory. -> Well suited also for small datasets.

	Dandvantaga.
1	TC [D(N)] makes it show for large datasets. Not suitable for large arrays.
	It is used when:
-	Dealing with a small dataset.  Searching for a dataset stored in contiguous memory
	THEORY (Binary Search)
	<u>T6</u>
-	BEST CASE: O(1)  WORST CASE: O(log N)  AVY. CASE: O(log N)
	Conditions to apply binary cearch:
$\rightarrow$	data str. should be sorted.  across to any element of the data structure should take const. time
	Advantages
7	Facter than linear search.  More efficient than other searching algos with a similar  TC like interpolation search or exponential search.
	Disadvantages
_	Array should be sorted.



must be able to be ordered.

Insertion Sort

Simple sorting also that works by iteratively unserting each element of an uncerted list into its correct pas in sorted portion of the list.

void ins\_sort (int arr[], int-n)  $\{$ for (int- i=1; i < n; i+t)  $\{$ 

int key = arr[i];

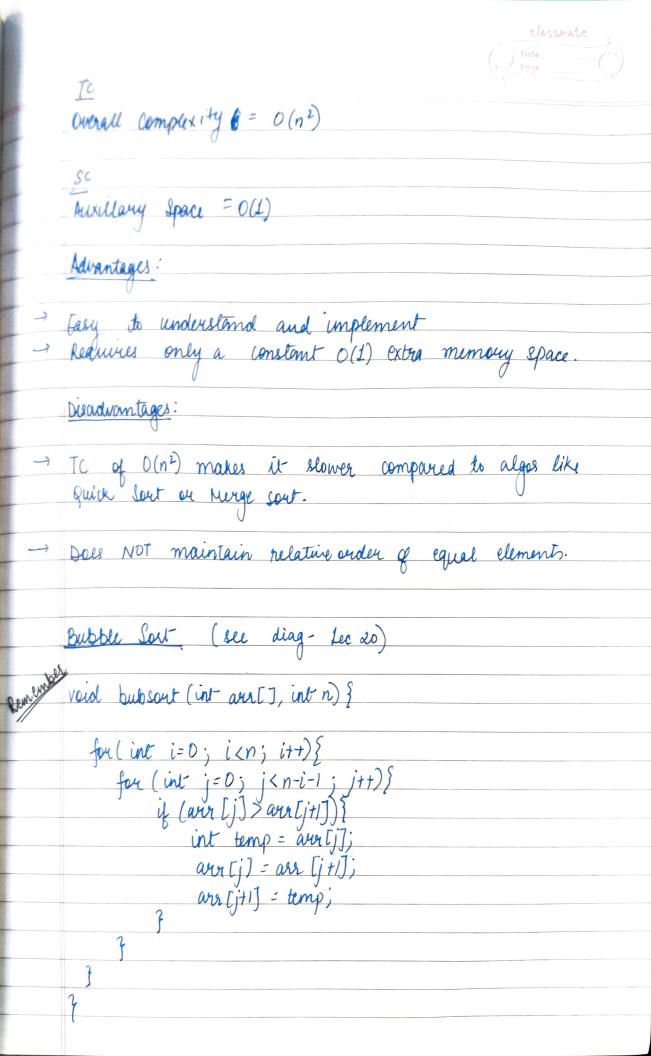
arr[j+1] = key;

BEST CASE: O(n)

→ HORST": O(n²) → Randomly ordered → AVG. ": O(n²) → Reverse Order

SC (Auxillary Space: 0(1))

Advantages Simple & cary ... Efficient for small lists & nearly sorted lists Disadvantages: Inefficient for large luts
Not as efficient as other sorting algos like merge quick cost Sel diag-Lec 20) sel-sort (int arr(), int n){ for (int i=0; i(n; i++) { int min\_idx = i; for (int j= i+1; ) < n; j++) { if (air[j] < arr [min\_idx] )} min-idx=j; int temp = arr[i]; aru[i] = ar[min-idx]; arr[min-idx] = temp;



	Date Page
	TC 0(n2) SE 0(1)
	Advantages
	vary to understand & implement  Doesn't require any additional memory
	N'
7	TC of O(n²) which makes it slow for large data sets.  Comparison based sorting algo limits efficiently of algorith in certain cases.