Name Hrishaldh Upadhyay Date. -Rollno: 32 Page No. Assignment: 02 Ques-1) linear search Pseudocade: book linear search (int are [], inthey) too (i=o;i<kn;i+t) if (ar [i] = = key)
iroturn toue; oreturn fabe; Que 2) Psetado code for iterative insertion sost ITERATIVE. for Cintiel; i<n; i++) ; [i]a = 6 this int j = i-1; While Cj>= 0 & eatj]>+) a[j+1] = a[j] a[j+i] = +;

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,	7								
9	1	0	01	16) (DOT	·V	0	
-		2	4	31	1	21	V	2.	-

Yold 80st Cotass [], int n)

if Cn<=1)
return;
Sort Corr, n-1);

int dast = arr [n-1];

while Cj >= 0 & & orr [j] > lost)

our [j+1] = our [j]

con [j+1] = clost.

Start com sort elements while viccining new ones thats

why it is called conline sorting.

- Other sorting techniques like merge, Quick, selection can't do this.

Sorting best aug worst technique COM 1 & X 1 T X Bubble Orn O(m²) O(m²) Selection O(m²) O(m²) O(m²) Truestion O(m) O(m²) O(m²) Count O(m+k) O(m+k) O(m+k) Quick O(mlogn) O(mlogn) O(m²) Menge O(mlogn) O(mlogn) O(mlogn) Neap O(mlogn) O(mlogn) O(mlogn) Radix O((m+k) O(d*(m+k) O(d*(m+k))		At At At At			DatePage No.
Sorting best away technique COM L & X 1 T Y Bubble On O(n²) O(n²) Selection O(n²) O(n²) Travertion O(n) O(n²) O(n²) Count O(n+k) O(n+k) O(n+k) Quick O(ndogn) O(ndogn) O(n²) Merge O(ndogn) O(ndogn) O(ndogn) heap O(ndogn) O(ndogn) O(ndogn)					
Hechnique COM L & XI T Y Bubble OGN OCM2) OCM2 Selection OCM2) OCM2 Tresertion OCM) OCM2 OCM2 Count OCM+R OCM+R OCM+R Quick OCM-logn OGN-Combogn OCM2 Merge OCM-logn OCM-logn OCM-logn Neap OCM-logn OCM-logn OCM-logn Neap OCM-logn OCM-logn OCM-logn	_	Dues 3>		* 3V1	
Bubble O(n) O(n²) O(n²) Selection O(n²) O(n²) O(n²) Travertion O(n) O(n²) O(n²) Count O(n+k) O(n+k) O(n+k) Quick O(nlogn) O(nlogn) O(nlogn) Merge O(nlogn) O(nlogn) O(nlogn) heap O(nlogn) O(nlogn) O(nlogn)		Sorting technique		aug 1 LEXITY	terou
Travertion O(n) O(n ²) O(n ²) Count O(n+k) O(n+k) O(n+k) Quick O(nlogn) O(alogn) O(n ²) Merge O(ndogn) O(ndogn) O(ndogn) Neap O(ndogn) O(ndogn) O(ndogn)			© (m)	O(m²)	
Count OCn+R) OCn+R) OCm+R) Qwick OCndogn) OGlogn) OCn2) Merge OCndogn) OCndogn) OCndogn) heap OCndogn) OCndogn) OCndogn)		Selection	BCn2)	B(n2)	, OCn2)
Qwick OGnlagn) OGnlagn) OGnlagn) Merge OGnlagn) OGnlagn) OGnlagn) heap OGnlagn) OGnlagn) OGnlagn)		Insertion	ÓCn)	O(n2)	OCn2)
Merge O(ndogn) O(ndogn) O(ndogn) Neap O(ndogn) O(ndogn) O(ndogn)	_	Count	OCn+k)		
heap O(ndogn) O(ndogn) O(ndogn)		Qwick	OCndogn)	O Gologn)	O(m2)
The state of the s		Merge	O (Indogra)	O(ndogn)	O (on logn)
Radix Old (mtk) Ocd * (mtk) Ocd * (mtk)	The state of	heap	3 Condagn)	O(ndogn)	OCndogn)
	- Police	Radix.	Old Critic)	OCd* (make)	OCd*Cn+P)
				A COMMENT	

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Dees4)	Scotting techniques	Implace	Stable	Online
	Bubble	Yes	Yes	No
	Selection	You	No	No
	Insertion	Yes	Yes	tes
	Count	No	Yes	No
	Quick	Yea	No	No
	Morge	No	Yes	No
	heap	Yes	No	No
	Radia	No	Yes	No
				7
		to for the	201	
		1 + 2 - 1 - 1 - 1 - 1		
	6	San Trans		
		1 July 1	4.1	

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Oves 5	Recursive Binary Sears:
	int Bin sear a (int ars [], Int target, inthis
	if Cd > h) f
	oroturn -1; /1 element not yound
	if Carr [mid] = = darget)?
	return mid;
	if C target < arr [mid]) { oroturn binsonach Carr, d, mid-1, starget
	felse
	porturn binsearch Care, mid+1, high, tayit
	Marine Ma
	Iterative binary Search!
	int bin Search (int anstint target)
	Jow = 0;
	high = dength (arr)-1; while (low <=high)
	id (one [mid] = = tonget):
	if (arr [mid] = = target);
	elseif (arr [mid] < target) dow = m+1;
	clae

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- 131-48	
	high = mid=1
	high = mid-1;
· GE	oroturn - 1;
1 4 6 6 7	Later to the second decree and market
Quea-6	Dividing the association of stand demonstria days
	or the array searth is resulted in out of bound
	James de la company de la comp
	1. Calling the fre with parameter are as sorted array
	target as element to search and low, high as starting
	ending boin of seach seasch.
3 = 1 - 1	2. base case if low > high that is target not
	Same Part of the P
	8. Otherwage
	· mid will be call calculated.
BLOWN THE REAL PROPERTY.	· and checking arris mid = = starget
	starget found at mid which is noturned
	· and if arr's mid < target high is set to mid-line return
	high is set to mid-lie votum
	· and if arr's mid > darget.
	Clow = mid+1
	pseudo code
	fre binsearch Carr, Jaco, shigh, target) {
	1/2 (dow > high)
	mid = (land 1/2)
	mid = Clow + high)/2
	if Can [ton mid] = torget)
	Orania,

chelf (arr [md] > target);

thigh = mid-1

return bin search (arr, dow, m-1, target);

che

roturn bin search (arr, midtl, chigh target); Ques-7) int findpairsumk Carr, k) of 8621 (arr); inteletio; int right = longth (ans) -1; while (deft < right)? if Corr [deft] + orr [right] = = k)

croturn 1 // found

che if Corr [deft + orr [right < k)

deft = deft + 1 right = right-1 cretum -1 //not found

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Ques 8). Duick Sost - fastest scotting also especially for large dataset.

- · Merge sost | Heap sost for moderate dataset
- . Insertion or Selection Sost you small dataset
 - . Insertion sost for meanly rosted data

Over 9)

Inversion: When smaller element is after
larger element if the sosting is ought to be
in ascending order or rule versa for
descending order.

17,21,31,8,10,1,20,6,4,5}

m=10 >> mid=10=5

17,21,31,8,10,1,20,6,4,5}

[7,21,31,8,10] [1,20,6,4,5]

{7,21} {31,8,10} {1,20} {6,4,5}

{7} {21} {81} {8,10} {13}{20} {6}{45}

{8} {6} {5}

 $\{7[2]\}$ $\{3]\}$ $\{8\}$ $\{6\}$ $\{1\}$ $\{20\}$ $\{6\}$ $\{4\}$ $\{5\}$ $\{7,2]\}$ $\{8,3]\}$ $\{1,10\}$ $\{1,20\}$ $\{4,5\}$ $\{4,5\}$ $\{7,8,2]$ $\{8,3]\}$ $\{1,6,10,20\}$ $\{4,6\}$ $\{5\}$ $\{7,8,2]$ $\{8,3]\}$ $\{1,6\}$ $\{1,20\}$ $\{4,6\}$ $\{5\}$ $\{7,8,2]$ $\{1,4,6,20\}$ $\{4,6\}$ $\{5\}$ $\{7,8,2]$ $\{1,4,5,6,20\}$

No. of inversion: 5+5+5+5+2+1+1+1+1+1 +1+1+1+1 = 31

Duesto) Best case: When privat chierds array in equal values.

West case: When privat chierless array in highly umbalanced way.

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Merge sost:
best case: T(n) = 2T (ny) + 0(n)
Woost ast In = 27 (2) +oh)
Qwick Sost
best asso T(n) = T(m/2)+T(m/2)+O(n)
Worstowe T(n) = T(n-1)+O(n)
Similarities:
TC = O (ndogn)
Difference In Quick Sost TC varies.
Dues 12) void selection Sort Larr, N) {
for(1=0; ixn; i++)
3-+->
i = mm + tci
for Cj = i+1; j < n; j++) f [(an Cj] < an [min)
min = j;
3
minvalue = arr [min];

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Date. _ Page No. while Comin > i) arr [min] = arr [min-1] min = min - 1are [i] = minualue; Ques - 13) Void 80st Carr, n) ? bool swapped; too (intizo; i < n-1; i++) { swapped = dalse; for (inty=0; j < n-1; j++) { if Carried > arr [j+1]) 8wap Corr[j], arr [j+1]; Swapped = true; if (1, 8wapped) break;

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	Quos	14). Merge 80st of	stimized for external sosting inques capproach. postioned data to fitmemory.
		· Divide and a	mouer abbroach.
		· Requires Small	postloned data to fitnemosy
		Esdernal Scotling	Internal Sostling
	•		
	On	withal memory	on RAM.
-	Eg.	Quick, morge	Eg: bubble, selection,
1		Quide, morge Sost	Eg: bubble, relection, insorting, rost.
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			NAME OF THE PARTY
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