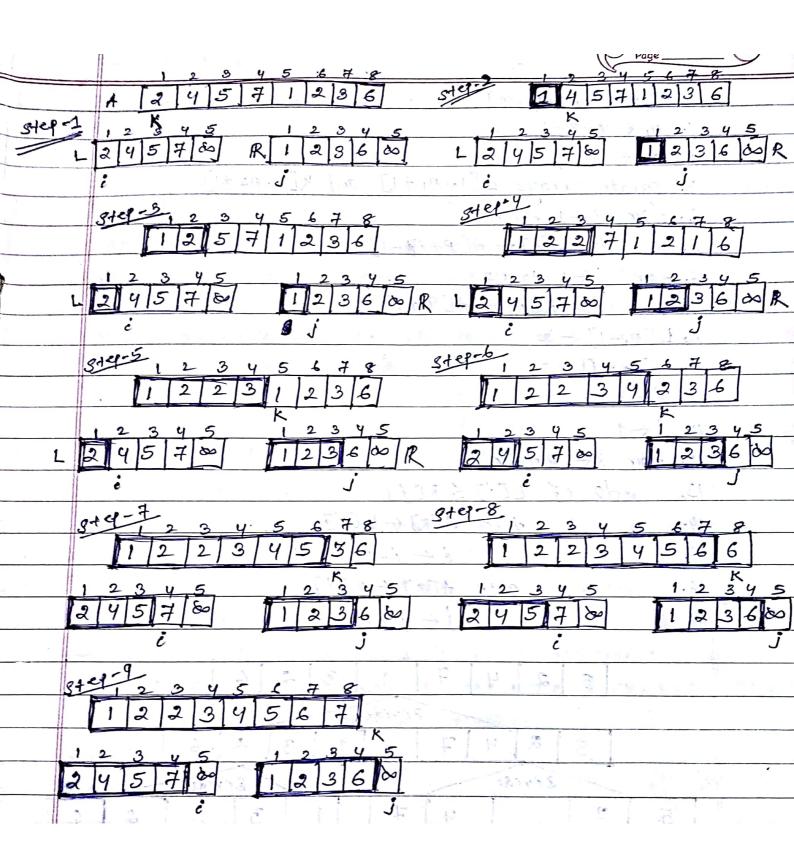
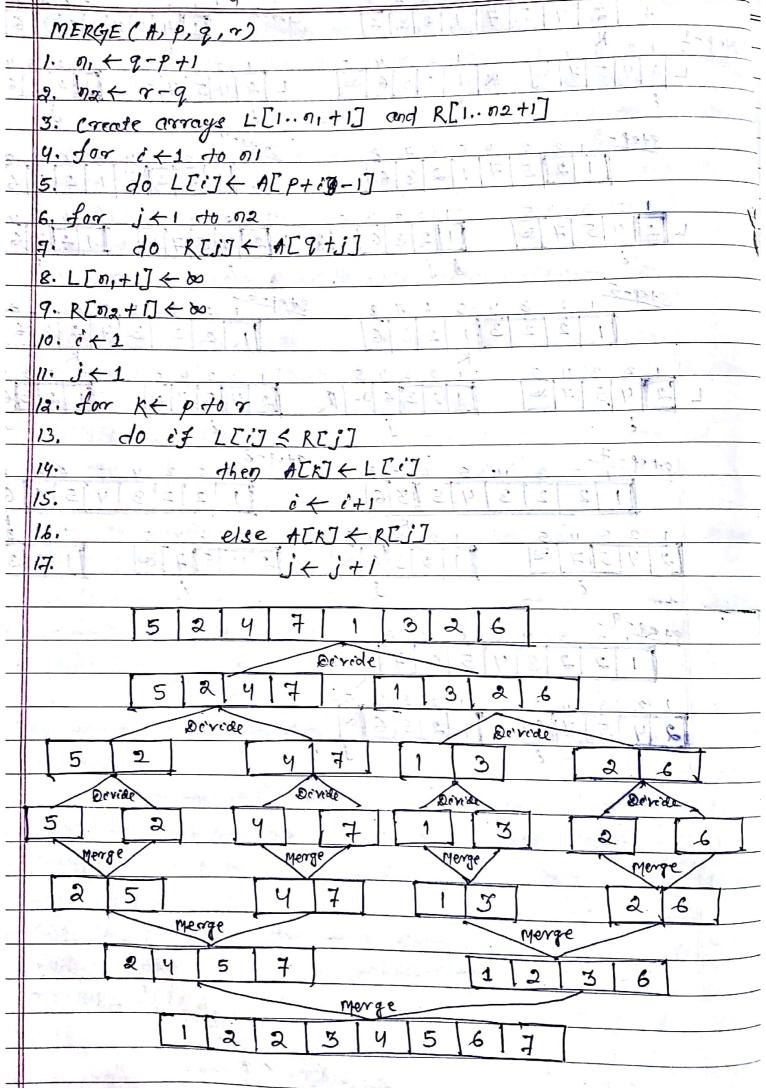
DIVIDE AND CONQUER APPROACH CIASSMALE
> In divide and setting the setting the
Je divide-and-enquer approch, are break the problem ento
Several subproblems that are similar to the original problems but smaller in size, solve the problems
recursively and then combine these solutions to create
a solution to the original problem.
-> Recursive algorithmy follow divide- and- conquer copproch.
-> The diride-and-conquer approch involves three steps at
each level of the recursion.
1. DIVIDE: The problem is devided ento a number of
Subproblems.
2. CONQUER: Conquer the subproblems by solving them
recursively. If the subproblem sizes are small enough, then
Solve the subpostlems in a straightforward onanner.
3. COMBINE: Charbeine the solutions to the subproblems
into the solution for the original problem.
77
-> There are different algorithms which follow divide - and - conquer
approch:
1. Merge Sort.
2. Aces'cs sout.
3. Bringry Search.
MERGE SORT
The merge sort algorithm follows the donide-and-conquer
poradigny:
DIVIDE: Devide the op-element sequence to be souted
onto two subsequences of 1/2 elements each.
onto two subsequences of 1/2 elements each.
conquer: Sout the two subsequences reconsively using onerge surt.
conquer: Sout the two subsequences reconsively using onerge surt.
CONQUER: Sout the two subsequences reconsively using
conquer: Sout the two subsequences recensively using onerge sout. Compine: Merge the two souted subsequence to
conquer: Sout the two subsequences recensively using onerge suit. Compine: Merge the two souted Subsequence to produce the souted answer.
conquer: Sout the two lubrequences recursively using onerge sout. Combine: Merge the two souted subsequence to produce the souted answer. MERGE_SORT(A, P, T) 1. if P(T)
into two subsequences of 1/2 elements each. CONQUER: Sout the two subsequences reconstively using onerge suit. Compine: Merge the two souted subsequence to produce the souted answer. MERGE_SORT(A, P, r) 1. if P(r) 2. then 9 + 1(P+r)/21
into two subsequences of 1/2 elements each. CONQUER: Sout the two subsequences recursively using onerge suit. Companie: Merge the two souted subsequence to produce the souted answer. MERGE_SORT(A, P, r) 1. if P(r 2. then 9 + 1(P+r)/2] 3. MERGE_SORT(A, P, 9).
into two subsequences of 1/2 elements each. CONQUER: Sout the two subsequences reconstively using onerge suit. Compine: Merge the two souted subsequence to produce the souted answer. MERGE_SORT(A, P, r) 1. if P(r) 2. then 9 + 1(P+r)/21





	Analysis Of Merge Sort:
- 100	The worst-case running time of onerge sort on a numbers is TIN:
- 1885	> 17 array contains one element, then overge sout takes constant dione.
	- If array contains more than one element i.e. 171, then we break
	down the acronoing time as:
	givide! The divide step just conjutes the middle of the
	Subarragy which takes constant trone i.e. 2(1) = Q(1)
	Conquer: one receirsively solve two subproblems, each of size 1/2,
	whoch contributes 27(1/2) to the ourning time.
	Combine: company n-element subarray takes time (1)
	So, CCT) = ACT) CLC and I as the Act of Act
	per have the control of the control
	$T(n) = \begin{cases} B(1) \\ (if n = 1) \end{cases}$
	2T (7/2) + O(1) if 171
	ive can recurrence as
rocked .	with and and process and offer the sold a regarder sall in
	$T(\eta) = 2T(\eta/2) + c\eta cf 971$
	- Die curen a de control de menall retenunting set one and en de
	where constant a represents the time required to solve
F 31 rd	problems of size 1 as well as the time per array element
, 40	of the devide and comprène steps.
See who	gtep-los han algebra to to come to the second to the second to the
a spr	a han T Cn2 and should step-2 a con sight as a month
	I st to be the acre on the no new perference of the acres and
	T(1/2) T(1/2)
1	CON TONY) TONY) TONY)
FL. Z.	some of the souls are manhore and all all and and a souls and
Ţ.	$c\eta/2$ $c\eta/2 \longrightarrow c\eta$
ly o	- cn
	cn/y cn/y cn/y en/y
	The same of the sa
20	Lac ap Later Car Lacate, Lagrance - dep year Goal of M. office
	$A \in C \longrightarrow C \cap A$
7	Contract Con
-	7 godes
	- Agricogn (a) 4 (a) 4 (a) 4 (a) (a)
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	The sub problem size for a gode cet depth i = n/2i
1.5	The state of the s
L. Supra	The same of the sa
	7 9=2:
	$\Rightarrow n = a' $ $\Rightarrow s = s \neq a $
	=> 104 0 = e /0422
- 1	$\Rightarrow \log \eta = \log 2$ $\Rightarrow \log_2 \eta = e^{-1} \log_2 2$ $\Rightarrow e^{-1} = \log_2 \eta$
	-/
4	The depth of the tree is log of.
	The free hoes (log n + 1) levels (cer 0,1,2,, log n)
(0)	Each level constrag co
	so, total cost is cn (log 7+1)
-	= cn log of + cn
W	= O(n/ogn)
	(
	Analysis Of mange sortes pryode-and-Conquer Approch:
→	
	by a recurrence.
- 11	
1 -3	Recurrence describes the overall running time on a problem
	of size of on derons of the octoming time on soncell expects.
->	are apoll then solve the recurence by cosing mathematical tools
	and provide borends on the personance of the algorithm.
-> 	A recurrence for the ocumning time of a divide-and-conquer algorithm
$-\parallel$	is based on the three steps such as divide conquer and merge.
→	Let Ton) be the occumoing time on a problem of size n - If the
1	problem size is small an enasial some near a
3	problem Size is sionallow enguesh say 750 for some constant c.
	The straighteforatord solution of somaller size postler takes Q(1) times
	support at the proposes and a supportione
	The contract problem 2070
-4	The proplet of copie Schop roblems down a com
100	The solutions to the solutions
	the solution to the missing mother of
	the solution to the original problem, we get the recurrence of
	$(\beta \alpha)$
	$T(n) = \int_{-\infty}^{\infty} \theta(1)^{n} dt = \int_{-\infty}^{\infty} \frac{\partial f(1)}{\partial f(1)} dt = \int_{-\infty}$
	0.7(-1)
\parallel	$T(n) = \begin{cases} aT(n/b) + B(n) + C(n) & \text{otherwise} \end{cases}$
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