Div: B Computer Engineering AOA Acsignment 2 Explain Karatsuba Algorithm using divide and conquex 01 If we have two n-digit number x and y Assume B & the base of m and men (for instance m=n) a and y can be represented as 21, 22 and y1, 42 i.e. 2=21 \* B + X2 9= 91 + Bm + 42 . Product my can be written as My = (21 \*B" +x2) (y \*B" + 42) xy = 214182m + 21428m + x2418m + x242 There are 4 subproblems, 2141; 2142; x241 and x242 We reduce them into 3 sub problems, let a = 2141 , C=2272 , b= 2241 + 2142 : xy = a 82m + b 8m + C (Bm is usually taken as 10m) : b = (21+22) (41+22)-a-C For eq: Multiplication of 47x78 : x=47 y=78 x = 4\*10+7 4=7\*10+8 71=4, 12=7, 41=7, 42=8 a=21 #41 = 4x7=28 , C= x2 +42 = 7x8=56 b= (x1+x2)(41+42)=a-c= (11)(15)-28-56=81 -. 2X = a (10) t b (10) + C = 28(100) + 81(10) + 56 = 2800 + 810 + 56 : XX = 3666 (Sundaram) FOR EDUCATIONAL USE lage 1

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	L L		-1-	-1	1			1		
Q · 2	Use simplex method to solve IPP Z=x1-3x2+2x3									
	Subject to 321-72+2×3 <=7									
	-21 + 4x2 6 = 12									
			- 4	21+	322	. +8	×3	6=10		
			4 1 1 1 1 1 1 1	21,50	-		-			
								3 4 3 /2		
$\rightarrow$	Express 4	the	Par	oldo	ole	20	دی	tandord.	form.	
	Express the problem in standard form.  Maximize Z=2121-322+2x3+Os1+Os2+Os3=0									
		Subject to 321 - 22 + 223 + 31 + 052 + 053 = 7								
									+053=12	
	- 421+322+8x3+0s,+0s2-83=10									
	21,22,23,51,92,53 20									
	Simplex -	Simplex Table:								
	20195						1			
	Basec		Coef	obici'e	nt	06		PHS	Ratio	
10.	variables	21		23	31	Sz	53	solution		
9	Z	1	-3	2	0	0	0	0		
Sz leoves	Sı	3	-1	2	1	0	0	٦	7/-1=-7	
22 entess	82	-2	4	0	0	-1	0	12	12/-14=-3	
	S3	-4	3	8	0	0	-1	10	1013=3.33	
		1								
Iteration	Bosic	coefficients of			RHS	Patio				
00.	variables	21	72	X3	9,	\$2	53	solution		
1	2	-1/2	0	2	0	0	0	0		
S. leaves	31	5/2	-	3	1	1/4	0	10	1023/5=4	
no enters	22	-1/2		0	0	1/4	0	3	32-2=-6	
		-5/2	0	8	0	-3/4	1	1	12-215= -2/5	
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		\$3	0		11	-	-1/2	1	- 11		
			7.						4		
	. 71=4	, 72-5		X3	-0						
		,									
	: Zmin	= - Z ma	2 % -		11						
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	write short note on Job Sequencing with Deadlines. Explainment the help of an example.										
	with the	10 010	0.0	•							
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<b>→</b>	The obje	ective is	40	» \	brind	0	9	eque	ence of je	obs, which	n ls
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		er recent		
	s) tox each job, find a slot ic deadline and its greates			
	this slot is filled. If no such		the state of the s	
		0	1 2 3	
· journey	tirst we select I2 as it can completed within deadline.	beo	25	3
	completed within deadline.	0	52 3,	3
	Next II is selected.		25, 21, 23	
	It cornot be selected as its	deadline	e to over 100	we select 13
	as it can be completed with	nin dead	line.	•
->	35 is discorded as it con	not be	completed 6	refore deadline.
	The sequence 1s 30, 31, 5	13)		
8.4>	Perform Analysis of Inse	otion.	epat and s	selection sort.
->	Incretion sest:	Cost	Time	Time
	for i = 2 ton do	CI	0	, •
	key 4 A [ ] ]	(2	n-1	n-ı
	1-3-1	13	0-1	0.4
	whilelizo 22 key (A[17)	64	n-1	n(n+1) -1
	C17A = C1+17 A	(5	٥	v(v+)/5
	1	(6	0	n(n-1)/2
	40+13 = Key	(7	n-1	n~1
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	The state of the s	The second of the second		
	Best case:			
	Total = ((n) + (2(n-	1+(1-0)4)+(1	410-0+(+10	-13
	= (c1+(2+(3+(			
	= antb			
	= 00			
	⇒ 0(n)	1		
	worst case and avera	ge cose:		
•	Total = c1(n) + (2(n-1)+13(r	1-1)+C4(non4).	-1)+15/1011-17	) + (6 (n(n-1))+(4 (n-1
	= anythete	1	· ·	2
	$\Rightarrow O(\nu_5)$	25/5		
			(Best)	(worst)
	selection sort	cost	Time	Time
	for "=1 to n-1	C.	•	0
	imin = i	C2.	n-1	0-1
	10 x 3 = 1+1 to n	CB	U(UH) -1	U(U4) -1
	( [i]A < nimi] A) di	24	v(v-)/5	U(U-1) 5
	imin = j	cs	0	0(0-1)12
	temp = A[eman]	6c	N-1	0-1
	[1]A = [nimi]A	С7	0-1	N-1
	ACI) = temp	C8	N-1	n-1
	Best case:			
	Total = (1(n)+(2(n-1)+ (	3 (12+11-2/2)+	(4(12-1/2)+1	(6+r2+18)n-1
	= and + Putc			
	$\Rightarrow O(n^2)$			
		-111		
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	Worst care and Average case
	=> O(V3) = 0 V3+PUTC = 0 V3+PUTC (V3-10)+(0(V-1)+(0(V-1)+(0(V-1))+(0(V-1))+(0(V-1))+(0(V-1)+(0(V-1)
<ul><li>§ 5⟩</li><li>→</li></ul>	Explain sub of Subset Algorithm with the help of example.  Consider a set of non-negative integers (3,4,5,2) and sum=9.
	Sum of siven set of integers Ewi = sum of all set of integers
	is 14, we find state space tree. I wix: = required sum
	V: kth element of sat.
	k, & coixi, & coi
	(1,0,11)
xu=0 1	12) (3,3,2) (3,4,2) (3,9,2) (3,3,2) (3,8,2) (3,12,2)  (3,3,2) (3,4,2) (3,9,2) (3,3,2) (3,8,2) (3,12,2)  (3,3,2) (3,4,2) (3,9,2) (3,3,2) (3,8,2) (3,12,2)  (3,12,2) (3,12,2) (3,12,2) (3,12,2)
	(4,9,0) (4,5,0) (4,4,0) (4,6,0) (4,3,0) (4,3,0) (4,3,0) (4,10,0) (4,10,0) (4,10,0) (4,10,0) (4,10,0)
	(4,10,16)
	Thus, the solutions that we got from above state space tree
(1)	$x_{1}=0$ , $x_{2}=1$ , $x_{3}=1$ , $x_{4}=0 \Rightarrow &4.53$ $x_{1}=1$ , $x_{2}=1$ , $x_{3}=0$ , $x_{4}=1 \Rightarrow &3.4.23$
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