KNAPSACK PROBLEMS
STATE OF THE SAME WAS TO
we want to pack of citems on knapsack.
* The ith eyers is worth vi dollars and weight wi
pounds.
* Take as valuable load as possible, but con't
exceed W pounds i.e. W is the knapsaen capacity.
* Vi, wi and W are oftegers.
There are two types of knapsmer problems
> 0-1 Knapsack Problem: (Dynamic Programming is used)
* Each often is feeken or not taken
* Counnot take a fractional associat of an extern
or commot tecke an oten more than once
The cost operation youlless of & horring total
-> fractional Knowpeace Problem: (greedy Algorithm is wed)
* Gractions of stems can be taken rather than
having to make a binary (0-1) choice for each
c'tem.
N E TO THE TOTAL OF THE PARTY O
a problems on 0-1 knapepels:
Consider three chergs along with their respective
weights and values are geren:
To E C TIP , Parso Pa
w = 1 5 , 5 4 m 3 m 3 m 3 m bot long botals
V = 6 6 19 5 , 450 mg page sales broken
The knapsock has the onaxionum weight copacity
W=7 PERMIN NOTICE OF SITE OF SITE OF
coe have to fell the knapsack according to
greedy strategy such that it can have optiming
value.
-> Solution: " " Solution :
The second of th
(P) 02 500 016 1 X 2 30
92: an you 05 05)
she borner as Cart wise 3 colored year whomas of
The state of the s

decrement let charce: coe arrange the eterns conth
decreating to have
decreasing values  I w V
$\Omega_1$ $S$ $S$
I, 4 5
Ta a y
- I would have a later to be used to be property
Item I, is relected first as it has the
ondrionum value (i.e. I.=6)
Next all other often result in overflow since W=7
$\omega_1 + \omega_2 = 5 + 4 = 9$
$cO_1 + cO_3 = 5 + 3 = 8$
Here we can't teake fractional values.
So we get optionum valle » is 6 having total
weight is 5 which is less than actual cought
Capacety and and transfer to 2000 to the
2nd choice: Arrange the cteme co concreasing weights
I co v
I3 3 4
12 : 42000005 1-1 00 2001 done
The same of sales of 1 production of sales as a service a
Harry Hill Properties Age agent
Here the ferst exem in couth least want
1/1/20 1/10 (11/10) (11/10) (11/10) (11/10)
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1000 Value CS 975 = 9
The same of the sa
TO DIE 10/5 TO MO TONO 1
CION CONTRACTOR CONTRA
und valles are given: Tespective weight
$I = \langle I_1, I_2, I_3 \rangle \mathcal{I}_{Y} \mathcal{I}_{Y} \mathcal{I}_{Y}$
$\omega = \langle 5, 10, 20, 30, 40 \rangle$
The capacity of Knapsace is W = 60. Find the
Solution to the fractional knaproen problem.

1							Page		9
45.	Salution:		Item	w	. \	Vi	160	- 6	
			$T_1$	5	13	30	- 1	= 0	
			To	10	+ 5-68	20	-	2	
			$\Gamma_3$	20	A <sub>V</sub> L	100			
			Ly	30	a	90		. 2	
			$\mathcal{L}_{\mathcal{S}}$	40	= 40 c				
				la la	7	18-		1,2	
	In fractional knapsack, we have to fund rect								
-	reelue	per wei	ght ra	Arb cie.	P:	= Vi/	ນ;	- A-radio S	
			2	-	3	T. T.		A.	
		Item	eo i	Vi	Pi	= V:/a	)¿		
-		T,	.5	30 4	F83	6.0	2	and a	
		T2	10	20	à	2.0			
		<b>I</b> 3	20	2 150	C1	5.0		- 4.99	
-7	faller	Ty	30	90	21	3.0			ur N
		Is.	.40	160		4.0		V Dec all	
	Now.	. arrange	the val	ue of p	1 0	o dec	MPA.	sênoi d	ayex
		_	1665	2	Dan	4.0	7.00	d	
	150	N+em	ن قري	Vi	Pi	= Vi/w.	T	-12	-
F	- 201	$\mathfrak{T}_{1}$	5	30		6.0.	1		
-		F3 (E	20:	-100		5·0	nDan	Paul	.,24
	-	2.2£5	40 81	160	-	4.0	) table	00	
	- 1	<u>Cy</u>	30	90	1	3.0	2203.4		
	/ 1A	F2 5 2.	10	20	-	2.0	je <sup>2</sup>	- A-1	
	71-0					-	ш.	-1	
	Now, fill the knapsacle according to the decreasing							a ling	
1 .	Frank we choose etem I, whose							4-	
11	•					1 2 2	Co	35	19
	everyn as s, when charge effering							104	
	13 OUNDIE WEIGHT IS QU.								
11	NOW the total areight of knapsaul I, 5.								
	is 5+20=25								
5.1	Now, the next often is Is and its								
	weight is 40, but we want only 35. so, we choose								
	fractional part of itie.								
-   -	The rocke of fractional part of Is is (160/40) x35 = 140								
	Thus the maximum value of knapsies is:								
		30+100	+ 140= 2	70	′			100	

	& Find optional soin of the Knapsock. Instance given
	$\eta = 7$ and $W = 15$ .
	ODD I profit W Pi
	10 2 5
-	IL 5 3 1.66
	Ta 13 5 2.6
	Iy 7 7
142	To the Is of 600 1 200 1000 long to only only
	De 1 18 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	$g_{\overline{q}}$
-	There was the state of
	Ico profet W P:
	Is 6 6 6 1
٠,	1, 0, 2 10 00 2 5 01 01 01 01 01 01 01 01 01 01 01 01 01
	160 - 18 00 y 04.5
- 1	17 3 00 1 0 3 1 31
3 1	2:63 70 13 20 5 10 2:63 TOOMS CUOLA
	12 5 3 1.66
-	
	A
- 11	By Deight = 1+2+4+1+5+2 (act of 3) = 15
	By value = $6 + 10 + 18 + 2 + 13 + 5 \times 2 = 53.3$
#	
	(: 5 x2 = 3.33) or (2x 1.64)
(	The rest was the making of the contraction of the same
1 9	