bag capacity = 10 ~~25~~ 30

$x_1 \; x_2 \; x_3 \; x_4$ 30

(w_i) weights of the objects. $\{3, 4, 2, 3\}$

$x_1 \; x_2 \; x_3 \; x_4$

(P_i) profits of the objects = $\{30, 45, 25, 36\}$

$V[i,c] = \max\{V[i-1,c], V[i-1, c-(w_i)] + [P_i]\}$ i = objects

(formula to fill the profits in table). Capacity (c)

(P_i)	(w_i)		0	1	2	3	4	5	6	7	8	9	10
		0	0	0	0	0	0	0	0	0	0	0	0
30	3	1	0	0	0	30	30	30	30	30	30	30	30
45	4	2	0	0	0	30	45	45	45	75	75	75	75
25	2	3	0	0	25	25	25	55	70	75	75	100	100
36	3	4	0	0	25	36	36	61	70	75	91	106	111

Soln:-

$x_1 \; x_2 \; x_3 \; x_4$

1 1 0 1

* Here 4th object is included because the maximum profit in the 4th row "111" is present only in 4th row so 4th object is included.

* Third object is excluded because (now ~~only~~ when we do 111 − 36 = 75) now the

remaining profit 75 but "75" is present in both rows ie; 3rd & 2nd so 3rd object is excluded.

* Now the remaining profit is 75. 75 is present only in 2nd row not in first row so 2nd object is included.

* Now the remaining profit is 30 (75-45=30). And 30 is present only in 1st so first object is included

Therefore the solution is

	object	profit
1st	3	30
2nd	4	45
4th	3	36

$3+4+3=10$ $\quad$ $30+45+36=111$

$\therefore$ Capacity $=10$ $\quad$ Total maximum profit we get after filling the bag is "111".

Rough work

$$V[i, c] = \max\{V[i-1, c], V[i-1, c-(w_i)] + [P_i]\}$$

30
36
4 5

~~$V[4,4] = \max\{V[3,4], V[3, 4 -$~~

$$V[4,4] = \max\{V[3,4], V[3, 4-3] + 36]\}$$

$$= \max\{V[3,4], V[3,1] + 36\}$$

$$= \max\{25, 0+36\}$$

$$V[4,5] = \max\{V[3,5], V[3,5-3] + 36\}$$

$$= \max\{55, [3,2] + 36\}$$

36
25
1
61

$$= \{55, 25+36$$

$$V[4,6] = \max\{V[3,6], V[3,6-3] + 36\}$$

$$70, V[3,3] + 36\}$$

25 + 36

$$V[4,7] = \max\{V[3,7], V[3,7-3] + 36\}$$

$$= \{75, V[3,4$$

$$V[4,8] = \max\{V[3,8], V[3,8-3] + 36\}$$

[3,7]

$$75, [3,5] + 36\}$$

$V[4,10] = \{V[3,10]$

55
36
91

100, 75
36
111

$$V[4,9] = \{V[3,9], V[3,9-3] + 36\}$$