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Date: / /

capacity = 10

Item	Weight	Profit
1	3	30
2	4	45
3	2	25
4	3	36

$$V[i,j] = \begin{cases} 0 & \text{if } i=0 \text{ or } j=0 \\ V[i-1,j] & \text{if } w_i > j \\ \max\{V[i-1,j], V[i-1,j-w_i] + P_i\} & \text{if } w_i \le j \end{cases}$$

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

Step 1

When $i=1$, $w_1=3$, $P_1=30$

$j=1$ $V[1,1] = V[0,1] = 0$

$j=2$ $V[1,2] = \max\{V[0,2]\} = 0$

$j=3$ $V[1,3] = \max\{V[0,3], V[0,0]+30\} = 30$

$j=4$ $V[1,4] = \max\{V[0,4], V[0,1]+30\} = 30$

$j=5$ $V[1,5] = \max[V[0,5], V[0,2]+30] = 30$

$j=6$ $V[1,6] = \max[V[0,6], V[0,3]+30] = 30$

$j=7$ $V[1,7] = \max[V[0,7], V[0,4]+30] = 30$

$j=8$ $V[1,8] = \max[V[0,8], V[0,5]+30] = 30$

$j=9$ $V[1,9] = \max[V[0,9], V[0,6]+30] = 30$

$j=10$ $V[1,10] = \max\{V[0,10], V[0,7]+30\} = 30$.

Step 2

when $i=2, w_2=4, P_2=45$

j=1 $V[2,1] = V[1,1] = 0$

j=2 $V[2,2] = V[1,2] = 0$

j=3 $V[2,3] = V[1,3] = 30$

j=4 $V[2,4] = \max\{V[1,4], V[1,0]+45\} = 45$

j=5 $V[2,5] = \max\{V[1,5], V[1,1]+45\} = 45$

j=6 $V[2,6] = \max\{V[1,6], V[1,2]+45\} = 45$

j=7 $V[2,7] = \max\{V[1,7], V[1,3]+45\} = 75$

j=8 $V[2,8] = \max\{V[1,8], V[1,4]+45\} = 75$

j=9 $V[2,9] = \max\{V[1,9], V[1,5]+45\} = 75$

j=10 $V[2,10] = \max\{V[1,10], V[1,6]+45\} = 75$

Step 3

When $i=3, w_3=2, P_3=25$

j=1 $V[3,1] = V[2,1] = 0$

j=2 $V[3,2] = \max\{V[2,2], V[2,0]+25\} = 25$

j=3 $V[3,3] = \max\{V[2,3], V[2,1]+25\} = 25$

j=4 $V[3,4] = \max\{V[2,4], V[2,2]+25\} = 45$

j=5 $V[3,5] = \max\{V[2,5], V[2,3]+25\} = 45$

j=6 $V[3,6] = \max\{V[2,6], V[2,4]+25\} = 45$

j=7 $V[3,7] = \max\{V[2,7], V[2,5]+25\} = 75$

j=8 $V[3,8] = \max\{V[2,8], V[2,6]+25\} = 75$

j=9 $V[3,9] = \max\{V[2,9], V[2,7]+25\} = 75$

j=10 $V[3,10] = \max\{V[2,10], V[2,8]+25\} = 75$

Step 4

when $i=4, w_4=3, P_4=36$

j=1 $V[4,1] = V[3,1] = 0$

$V[4,2] = V[3,2] = 25$

$V[4,3] = \max\{V[3,3], V[3,0]+36\} = 36$

$V[4,4] = \max\{V[3,4], V[3,1]+36\} = 45$

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$V[4,5] = \max\{V[3,5], V[3,2]+36\} = 36$

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

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

$V[4,8] = \max\{V[3,8], V[3,5]+36\} = 36$

$V[4,9] = \max\{V[3,9], V[3,6]+36\} = 36$

$V[4,10] = \max\{V[3,10], V[3,6]+36\} = 36$

Optimal sol" is $V[n,m] = V[4,10]$

$= 111$

If ith object has seloted then $V[i,j] \neq V[i-1,j]$

- 4th object is has been selected ~~then $V[i,j] \neq$~~ as maximum profit.
- So 111 - project = 111 - 36 = 75

  So $V[3,7] - V[2,7] = 75$

  So 3rd obj is not selected.

$V[2,7] \neq V[1,7]$

$75 \neq 30$

So 2nd obj is selected

- So $75 - P_2 = 75 - 45 = 30$

  $V[1,3] \neq V[0,3]$

  $30 \neq 0$

  So 1st obj is selected

x_1	x_2	x_3	x_4
1	1	0	1