ADA 2015

Mini Homework 4

B03902027

Consider it as a 0/1 knapsack problem.

Object i	Weight (w_i)	Value (v_i)
1	6	4
2	5	3
3	1	1
4	4	3
5	4	2

Let M[i, w] = value of an optimal solution to a 0/1 knapsack problem with i objects, weight w.

$$\mathrm{M[i,w]} = \begin{cases} 0, \ \ when\ i = 0 \\ M[i-1,w], when\ w_i > w \\ \max\{M[i-1,w], v_i + M[i-1, w-w_i]\} \end{cases}$$

i/w	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2	0	0	0	0	0	3	4	4	4	4	4	7	7	7	7	7	7	7	7	7	7
3	0	1	1	1	1	3	4	5	5	5	5	7	8	8	8	8	8	8	8	8	8
4	0	1	1	1	3	4	4	5	5	6	7	8	8	8	8	10	11	11	11	11	11
5	0	1	1	1	3	4	4	5	5	6	7	8	8	8	9	10	11	11	11	12	13

Hence, the answer table is:

Time	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Credit	0	1	1	1	3	4	4	5	5	6	7	8	8	8	9	10	11	11	11	12	13