ORIE 3310/5310/5311, Spring 2013

Lecture 10: Solving Inventory Planning Problems using Dynamic Programming

Example:

Period (i)	Demand (d_i)	Production cost (c_i)	Fixed cost (f_i)	Holding cost (h_i)
1	10	3	5	0.2
2	40	2	20	0.3
3	20	4	10	0.5
4	50	3	10	0.8

Notes

Summary of DP Computation:

	Stage 5	Stage 4		Stage 3		Stage 2		Stage 1	
Possible States (i)	f*_5(i)	f*_4(i)	x*_4	f*_3(i)	x*_3	f*_2(i)	x*_2	f*_1(i)	x*_1
0	0	160	50	250	20	286	110	321	10
10	0	130	40	210	10	266	100		
20	0	100	30	160	0	246	90		
30	0	70	20	135	0	226	80		
40	0	40	10	110	0	206	70		
50	0	0	0	85	0	186	60		
60	0			60	0	166	0 or 50		
70	0			25	0	144	0		
80	0					122	0		
90	0					100	0		
100	0					78	0		
110	0					46	0		

Hence, the optimal decision (quantity to produce in each period):

x_1 = 10

x_2 = 110

x_3 = 0

x_4 = 0

with the corresponding total cost = 321