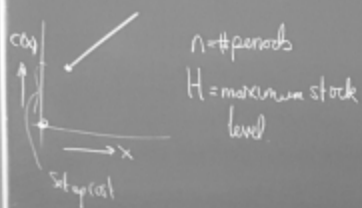


Production problem.

$$n=4, H=3, d_j=4, \forall j$$

$$c(x) = \begin{cases} 0 & x=0 \\ 5+x & x \geq 1 \end{cases}$$



$$f(i, i) = \min_x [c(x) + f(i+1, i+x)]$$

i	$f(i, i)$	$x(i, i)$	$f(i, i)$	$x(i, i)$	$f(i, i)$	$x(i, i)$	$f(i, i)$	$x(i, i)$
0					18	4, 5, 6, 7	9	4
1					17	3, 5, 6	8	3
2					16	2, 3, 4, 5	7	2
3					15	1, 2, 3, 4	6	1

(3, 0)

x	Cost prod + remaining cost
4	9 + 9
5	10 + 8
6	11 + 7
7	12 + 6

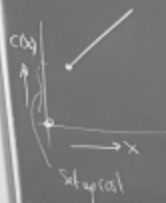
(3, 1)

x	prod + remain
3	8 + 9
4	9 + 8
5	10 + 7
6	11 + 6

Production problem.

$n=4, H=3, d_j=4, \forall j$

$$C(x) = \begin{cases} 0 & x=0 \\ 5+x & x \geq 1 \end{cases}$$



n = # periods
 H = maximum stock level

$$f(i, x) = \min_x [C(x) + f(i+1, i+x-d_i)]$$

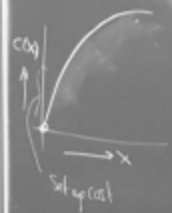
i	$f(i, 0)$	$x(0, i)$	$f(i, 1)$	$x(1, i)$	$f(i, 2)$	$x(2, i)$	$f(i, 3)$	$x(3, i)$
0	36	4 →	27	4 →	18	4, 5, 6, 7	9	4
1			20	3 →	17	3, 5, 6	8	3
2			25	2 →	16	2, 3, 4, 5	7	2
3			24	1 →	15	1, 2, 3, 4	6	1

$(i, 0)$	x	Cost prod + inventory cost	$(i, 0)$	x	Cost
2	0	7 + 18	4	0	9 + 27
3	0	8 + 17	5	0	10 + 26
4	0	9 + 16	6	0	11 + 25
5	0	10 + 15	7	0	12 + 24

Production problem.

$n=4, H=3, d_j=4, \forall j$

$C(x) = x(15-x)$



$n = \# \text{ periods}$
 $H = \text{maximum stock level}$

$$f(r, i) = \min_x [c(x) + f(r+1, i+x, d)]$$

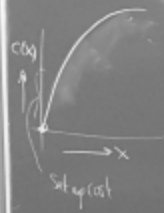
i	$f(0, i)$	$x(0, i)$	$f(1, i)$	$x(1, i)$	$f(2, i)$	$x(2, i)$	$f(3, i)$	$x(3, i)$
0	140	7	114	4 or 7	70	7	44	4
1			106	3	68	6	36	3
2			96	2	64	5	26	2
3			84	1	58	4	14	1

x		
4	44	114
5	50	106
6	54	96
7	56	84

Production problem.

$n=4, H=3, d_j=4, \forall j$

$C(x) = x(15-x)$



$n = \# \text{ periods}$
 $H = \text{maximum stock level}$

$$f(r, i) = \min_x [C(x) + f(r+1, i+x)]$$

i	$f(i, 0)$	$x_{(i, 0)}$	$f(i, 1)$	$x_{(i, 1)}$	$f(i, 2)$	$x_{(i, 2)}$	$f(i, 3)$	$x_{(i, 3)}$
0	140	7	114	4, 7	70	7	44	4
1			106	3	68	6	36	3
2			96	2	64	5	26	2
3			84	1	58	4	14	1

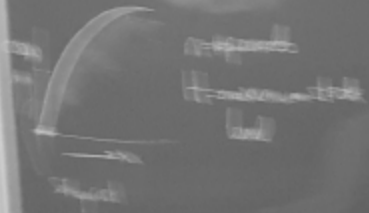
Answer

x_1	x_2	x_3	x_4
7	1	7	1

Production problem.

Cost: H, B, \dots, \dots

$$C(x) = x(F-x)$$



Suppose we want to "grow" our production

Suppose we have a penalty $a(x-x_0)^2$.

$$f(r, \bar{y}, y) = \min_x \left[C(x) + a(x-\bar{y})^2 + f(r, \bar{y}, x) \right]$$

y = previous period production



Minimize the cost

$\forall r, \bar{y}, y$