8\28\09

$n=4$	d_1	d_2	d_3	d_4
$H=4$	5	6	4	7

$c(x) = x(20-x)$

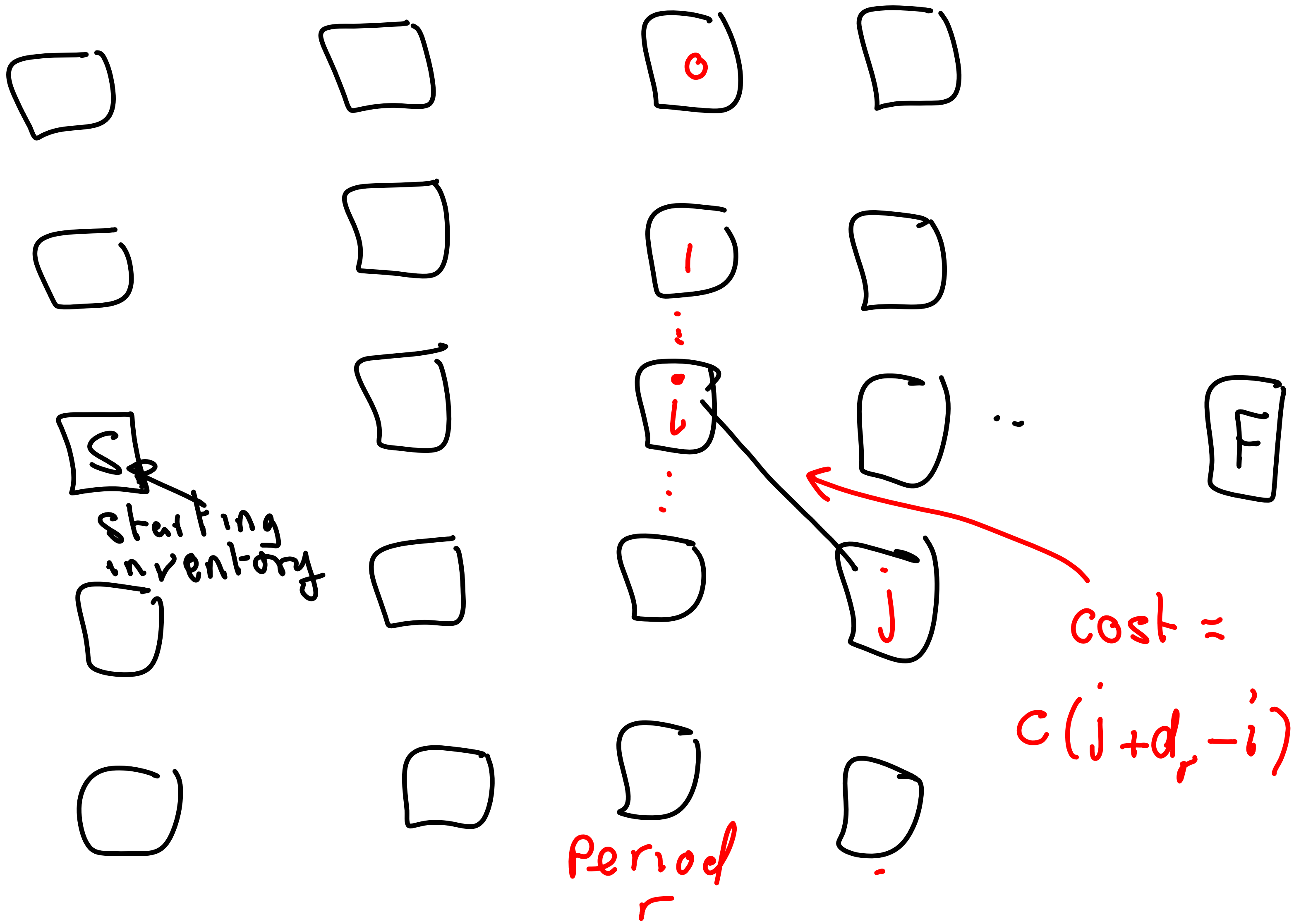
i	$f_1(i)$	$x_1(i)$	$f_2(i)$	$x_2(i)$	$f_3(i)$	$x_3(i)$	$f_4(i)$	$x_4(i)$
0	266	5	191	10*	147	8	91	7*
1	255	4	190	9	142	3 or 7	84	6
2	242	3*	187	8	127	2	75	5
3	227	2	182	7	110	1	64	4
4	210	1	175	6	91	0*	51	3

Now suppose we start with 2 items in stock. What is the optimal policy

$x_1 = 3$ $\quad$ $x_3 = 0$

$x_2 = 10$ $\quad$ $x_4 = 7$

Relation to shortest path problem



Make problem more "interesting"

(1) Add a holding cost

$$f_r(i) = \min_x \left[c(x) + f_{r+1}(i + x - d_r) \right]$$

Suppose it costs money to store things.

start period with inventory i } costs $h(i,j)$
end " " " j

$\cancel{c(x)}$ $c(x) + h(i, i+x-d_r)$

(ii) Allow "back-ordering" up to B

Negative inventory

$$f_r(i) = \min_x \left[c(x) + h(i, i+x-d_r) + f_{r+1}(i+x-d_r) \right]$$

$-B \leq i \leq H$

$p(y)$ = monthly cost in not filling y orders

$\boxed{p(y) = 0, \ y \leq 0}$ $\quad + p(d_r - (i+x))$

(iii)

Numerical solution w/ 3, 10, 0, 7

An extra cost

$s(x, y)$ = disruption cost of changing from production level x to production level y.

Drop holding cost...

$$\cancel{f_r(i) = \min_x \left[c(x) + s(x,y) + f_{r+1}(i+x-d_r) \right]}$$

$$f_r(i,y) = \min_x \left[c(x) + s(x,y) + f_{r+1}(i+x-d_r, x) \right]$$