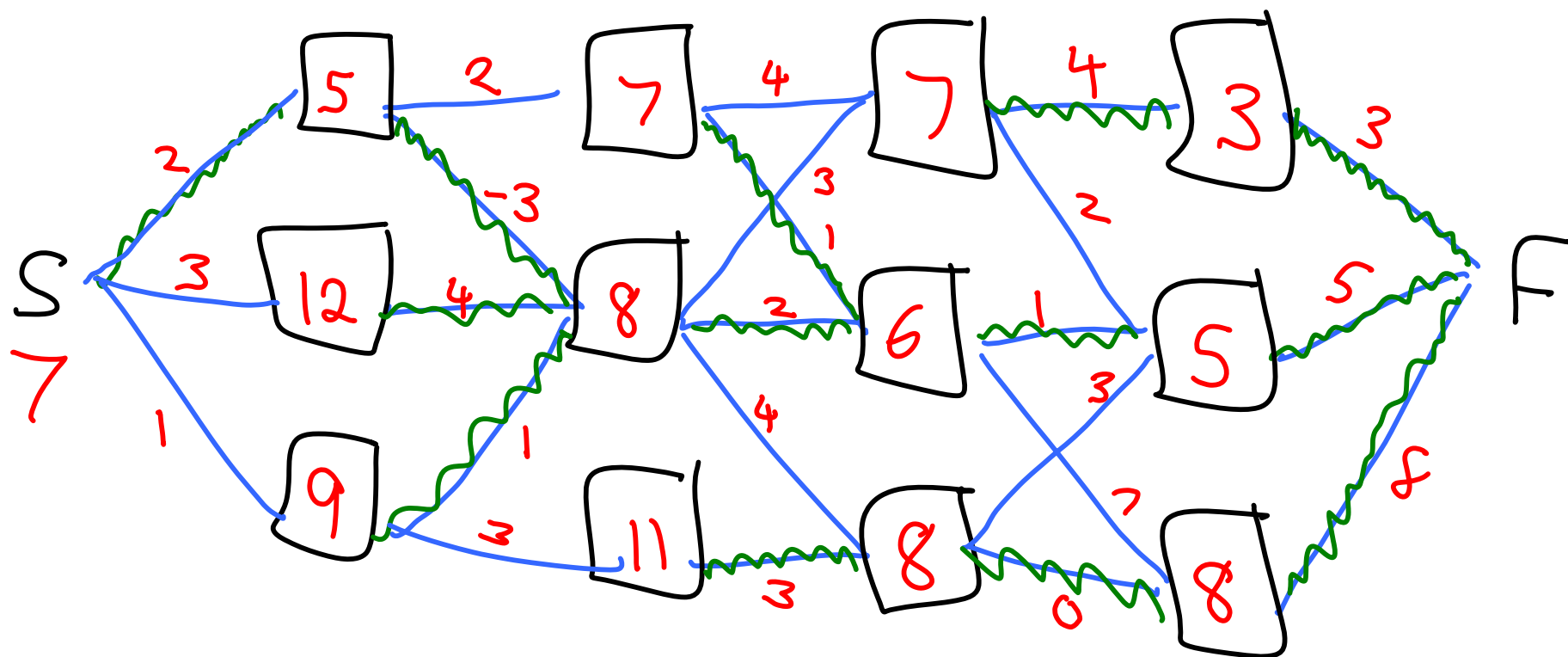
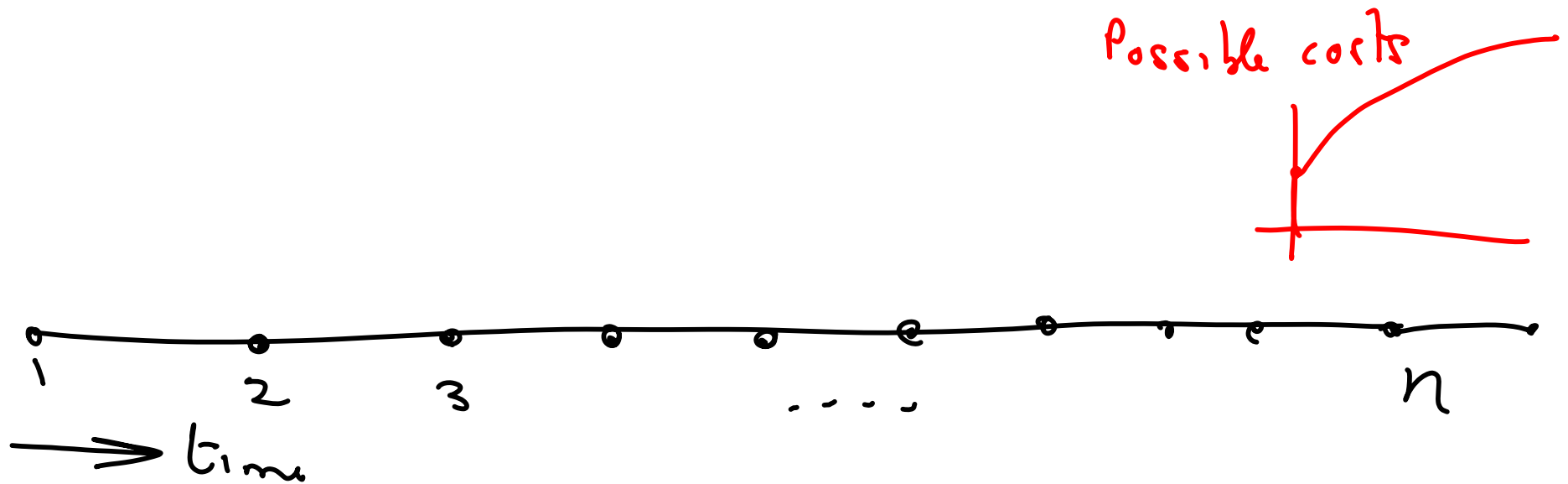


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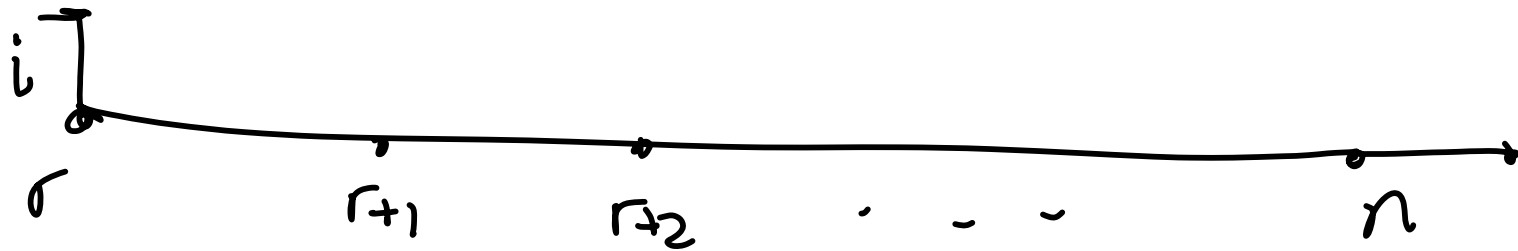


Simple Production Scheduling problem



Manufacture a single, n periods. Demand must be met.
costs $C(x)$ to make x in a period.
Demand in period i is d_i . Can store $\leq H$ for next period

Have to solve problems parameterised by (r, i)



$f_r(i) = \text{min. cost of problem } (r, i)$

$$f_r(i) = \min_{\substack{x \geq 0 \\ x \geq d_r - i \\ x \leq H - i + d_r}} \left\{ \begin{array}{l} c(x) \quad \text{period } r \\ + f_{r+1}(i+x-d_r) \quad \text{period } r+1, \dots, n \end{array} \right\}$$

$$f_{n+1}(i) = 0$$

↓ compute f_n

↓ compute f_{n+1}

⋮

↓ compute f_1

Example

$$H = 3$$

$$d_i = 2, \forall i$$

$$c(x) = x(16 - x)$$

$$n = 4$$

$F_i(0):$

$$x_1 = 5$$

$$x_2 = 0$$

$$x_3 = 3$$

$$x_4 = 0$$

i	f_1	x_1	f_2	x_2	f_3	x_3	f_4	x_4
0	94	5	70	5	48	4	28	2
1	85	1	63	1/4	39	3	15	1
2	70	0	48	0	28	0/2	0	0
3	63	0/1	39	0	15	0/1	0	0

	28	+	28	$x=2$
$f_3(c) = \min$	39	+	15	$x=3$
	48	+	0	$x=4$ x
	55	+	0	$x=5$

$f_2(i) = \min$	15	+	28	$x=1$
	28	+	15	$x=2$
	39	+	0	$x=3$ ✗
	48	+	0	$x=4$

$$f_3(2) = \min \begin{array}{lll} 0 & + & 28 & x = 0 \\ 15 & + & 15 & x = 1 \\ 28 & + & 0 & x = 2 \end{array}$$

$$f_3(3) =$$

$$0 + 15$$

$$15 + 0$$

$$x = 0$$

$$x = 1$$

$f_2(c) =$	mm	28	+	48	$x = 2$	
		39	+	39	$x = 3$	
		48	+	28	$x = 4$	
		55	+	15	$x = 5$	*