P3] Var:

I_n: inventory from n to $n+1$ (held overnight)

x_n: amount to buy at (end of) n

y_n: amount to sell at (beginning of) n

Constraints:

For $n=1$:

$y_1 \leq 40$ (can't sell more than initial in

$I_1 = 40 - y_1 + x_1$

$y_n \leq I_{n-1} \quad \forall\, n \in \{2, \dots, N\}$

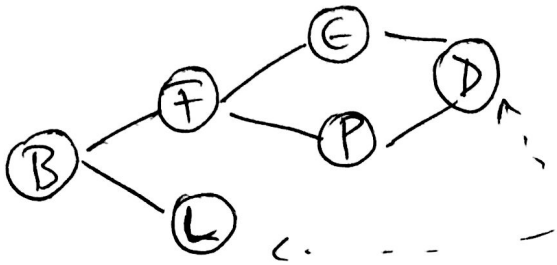
$I_n = I_{n-1} - y_n + x_n \quad \forall\, n \in \{2, \dots, N$

$I_n \leq 100 \quad \forall\, n \in \{1, \dots, N\}$

Obj:

$$\max \sum_{n=1}^{N} (p_n y_n - c_n x_n)$$

P4]



	Duration
B	3
F	2
E	3
P	4
D	1
L	2

Var :

x_t : time at which we start task t.

T : completion time

Constraints :

$$x_t \geq 0 \quad \forall t$$

$$x_F \geq x_B + 3$$

$$x_L \geq x_B + 3$$

$$x_E \geq x_F + 2$$

$$x_P \geq x_F + 2$$

$$x_D \geq x_E + 3$$

$$x_D \geq x_P + 4$$

$$T \geq x_D + 1$$

$$T \geq x_L + 2$$

Obj :

$$\min T$$

B5

$i \in \{1,2\}$ ($i=1$ is ~~Nitrogen~~ Silicon and $i=2$ is Nitrogen)

$j \in \{1,2\}$ (for fertilizers 1 and 2)

Var: x_{ij} : lbs of i used to produce fertilizer j.

Constraints:

$x_{21} \geq 0.4(x_{11} + x_{21})$ (Fert. 1 must have at least 40% Nitro.)

$x_{12} \geq 0.7(x_{12} + x_{22})$ (Fert. 2 must have at least 70% Sil.)

$x_{11} + x_{12} \leq 100$ (100 lbs available of Sil.)

$x_{21} + x_{22} \leq 80$ (80 lbs " of Nitro.)

$x_{ij} \geq 0 \quad \forall i,j.$

Obj:

$$\max \left(70 \cdot (x_{11} + x_{21}) + 40 \cdot (x_{12} + x_{22}) - 10 \cdot (x_{11} + x_{12}) - 15 (x_{21} + x_{22}) \right)$$