Sets

P	products
T	months
M	machines

Data

$Profit_p$	Profit per unit of product $p \in P$
n_m	Available machines $m \in M$.
$Usage_{pm}$	Time required on machine $m \in M$ to make one unit of $p \in P$
$Maint_{tm}$	# machines $m \in M$ unavailable in month $t \in T$
$Market_{pt}$	Max # product $p \in P$ we can sell in month $t \in T$
MaxStore	Max storage per product per month.
StoreCost	Cost per unit per month
FinalStore	Final amount of each product in storage.
MonthHours	Hours per month available on each machine.

Variables

X_{pt} units of product $p \in P$ to make in month $t \in T$

S_{pt} —"— to store at end of —"—

Y_{pt} —"— to sell —"—

Objective

$$\text{Max} \sum_{t \in T} \sum_{p \in P} \text{Profit}_p \times Y_{pt} - \sum_{t \in T} \sum_{p \in P} \text{StoreCost} \times S_{pt}$$

s.t.

Constraints

$X_{pt} \geq 0, S_{pt} \geq 0, Y_{pt} \geq 0 \quad \forall p \in P, t \in T$

non-negative integers

$$S_{pt} = S_{p(t-1)} + X_{pt} - Y_{pt} \quad \forall p \in P, t \in T \text{ st } t > 0$$

$$S_{p0} = X_{p0} - Y_{p0} \quad \forall p \in P$$

$$Y_{pt} \leq \text{Market}_{pt} \quad \forall p \in P, t \in T$$

$$S_{ps} \geq \text{FinalStorage} \quad \forall p \in P$$

$$\sum_{p \in P} \text{Usage}_{pm} \times X_{pt} \leq \text{MonthHours} \times (n_m - \text{Maint}_{tm}) \quad \forall m \in M, t \in T$$

$$S_{pt} \leq \text{MaxStore} \quad \forall p \in P, t \in T$$