SHOP ORDERING PROBLEM

$\Pi = \{\pi_1, \pi_2, \ldots, \pi_\theta\}$ set of products

$\Omega^t = \{w_1^t, w_2^t, \ldots, w_{N^t}^t\}$ set of orders of day t

$\triangle = \{s_1, s_2, \ldots, s_M\}$ set of suppliers

θ : number of different products

M : number of suppliers

P_i : selling price of each product   for $i \in [1, \theta]$

N^t : number of orders for day t

D_t^i : number of product i sold in day t

I_t^i : number of product i in inventory in day t

O_t^i : number of product i ordered in day t

$K_t^{s_j}$: number of type of products ordered in day t from supplier s_j

C_{fix} : fixed cost

$C_{s_j}^i$: cost of product i from supplier s_j

C_{H_t} : cost for holding unsold products

C_{UD_t} : cost for unsatisfied demand

Disc ( ) : discount function

each day is sold $\min [D^i_t, I^i_t]$

Orders cost:

$$\text{Cord}(s_j, t) = C_{fix} + \sum_{i=1}^{K} O^i_t \cdot C^i_{s_j} - \text{Disc}\left(\sum_{i=1}^{K} O^i_t\right)$$

$$\min\left(\sum_{n=1}^{N^t} \text{Cord}_n(s_j, t)\right)$$

← minimization of orders cost

- Unsatisfied demand cost:

(only if $D^i_t > I^i_t$)

$$C_{UD_t} = \sum_{i=1}^{\theta} (D^i_t - I^i_t) \cdot p_i \cdot \mathbb{I}(D^i_t > I^i_t)$$

- Holding cost

$$C_{H_t} =$$

- Profit

$$P_r^t = (D^t_i \cdot p_i) - \left(\sum_{n=1}^{N^t} \text{Cord}_n(s_j, t)\right) - C_{UD_t} - C_{H_t}$$

- FIXED DATA : (?)

$$D_i^t, I_i^t, p_i, C_{fix}(s_J), C_i(s_J), Disc(s_J?),$$
$$O_i^t \text{ (precision)}$$

QUESTIONS :

- Fixed cost $\left\{\begin{array}{l} C_{fix} \\ \\ \\ \end{array}\right.$ depends on suppliers ?
  on type of product !
  on number of product ?

- on what depends h^i ?
- on what depends T^i ?

- Discount some for all suppliers ?

- O_i^t given or to be chosen ?