Assignment 1 - Linear Programming - Section A

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Sets

C cities
Q quarters

Data

i_c current number of barrels in city $c \in C$ [1]
d_{cq} predicted demand of barrels in $c \in C$ for quarter $q \in Q$
c_q predicted cost of dollars per barrel for quarter $q \in Q$

Decision Variables

x_{cq} number of barrels to deliver to city $c \in C$ in quarter $q \in Q$
s_{cq} number of barrels to store in city $c \in C$ at the end of quarter $q \in Q$

Minimize cost

$$\sum_{c \in C q \in Q} 25 s_{cq} + c_q x_{cq}$$

subject to

$$\sum_{c \in C} x_{cq} \leq 10000 \quad \forall q \in Q$$

$$\forall c \in C, \forall q \in Q \quad \begin{cases} \text{if } q = 0 & i_c + x_{c0} - d_{c0} = s_{cq} \\ \text{otherwise} & s_{c(q-1)} + x_{cq} - d_{cq} = s_{cq} \end{cases}$$

and optionally

$$S_{cl} \geq 3000 \quad \forall c \in C$$

where l is the last quarter.

[1] i for initial