Recall the language STORE-OPENING from question 1. Prove that if a polynomial-time algorithm deciding STORE-OPENING exists, then the corresponding optimization problem can be solved in polynomial time. The optimization problem is described below.

Instance: A set $\mathcal{L}$ of locations, a set $\mathcal{C}$ of cities, a distance function $d : \mathcal{C} \times \mathcal{L} \mapsto \mathbb{N}$, a cost function $b : \mathcal{L} \mapsto \mathbb{N}$, and $D \in \mathbb{N}$.
Solution: A set $S \subseteq \mathcal{L}$ such that for all $c \in \mathcal{C}$, $\min_{\ell \in \mathcal{C}}\{d(c, \ell) \leq D\}$; or $\perp$ if no such set exists.
Objective: Minimize $\sum_{\ell \in S} b(\ell)$