

Below is the formulation for the load balancing problem. We define some L such that this is the maximum tolerated difference between the highest and lowest demand faced

Sets

C set of Customers
 F set of Facilities

Parameters

c_{ij} $(i, j) \in C \times F$ cost of assigning customer i to facility j
 k_f $f \in F$ cost of opening facility f
 d_c $c \in C$ demand of customer c
 l_f $f \in F$ capacity of facility f

Variables

$x_{ij} \in \{0, 1\}$ $(i, j) \in C \times F$ Assigning customer i to facility j
 $b_f \in \{0, 1\}$ $f \in F$ Opening facility f

Objective

$$\min \sum_{(i,j) \in C \times F} c_{ij} x_{ij} + \sum_{f \in F} k_f b_f \quad (1)$$

Constraints

$$\sum_{j \in F} x_{ij} = 1 \quad \forall i \in C \quad (2)$$

$$x_{ij} \leq b_j \quad \forall (i, j) \in C \times F \quad (3)$$

$$\sum_{i \in C} d_i x_{ij} \leq l_j b_j \quad \forall j \in F \quad (4)$$