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
L		Maximal allowable difference in demand

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
$u_{max} \geq 0$		Demand of the busiest facility
$u_{min} \geq 0$		Demand of the least busy facility

Objective

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

Constraints

$$\sum_{j\in F} x_{ij} = 1 \qquad \forall i \in C \tag{2}$$

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

$$\sum_{i\in C} d_i x_{ij} \leq l_j b_j \qquad \forall j \in F \tag{4}$$

$$\sum_{i\in C} d_i x_{ij} \geq u_{min} \qquad \forall j \in F \tag{5}$$

$$\sum_{i\in C} d_i x_{ij} \leq u_{max} \qquad \forall j \in F \tag{6}$$

$$u_{max} - u_{min} \leq L \tag{7}$$

From the Capacitated Model, we have added three new constraints and two new decision variables. Our new decision variables include a positive limit to the demand faced by any facility and a positive lower limit. Constraints (5) and (6) then ensure that any demand faced by any facility f is bounded above and below. Finally, constraint (6) ensures that the difference between these limits are no more than some pre-defined limit L