Inputs

$\mathbf{K}$	the number of time slots about periodic data collection
K	the set of time slots, $K = \{1, ..., \mathbf{K}\}$
M	the set of mules
B	the set of beacons
c_b	the remaining battery capacity of beacon $b \in B$
L	the set of power level,
	$L = \{low, medium, high, infty\} = \{1, 2, 3, \infty\}$
e_l	the amount of consumed energy, when power level is $l \in L$;
	if $l = \infty$, $e_l = \infty$
$p_{b,l}^{m,k}$	the probability that mule $m \in M$ pass beacon b's transmission range when the power level is l at time slot $k \in K$
R	the reliability level about the system

Decision (dependet) variables

$$\alpha_{b,l} \begin{cases} 1 & \text{if the level of } b \in B \text{ is } l \in L \\ 0 & \text{otherwise} \end{cases}$$

$$y^m \begin{cases} 1 & \text{if trajectory of mule } m \in M \text{ is considered} \\ 0 & \text{otherwise} \end{cases}$$

Objectives

$$\max \min_{b \in B} \left(c_b - \sum_{l \in L} e_l \cdot \alpha_{b,l} \right) \tag{1}$$

$$\min \sum_{m \in M} y^m \tag{2}$$

Constraints

$$\sum_{l \in L} \alpha_{b,l} = 1, \quad \forall b \in B \tag{3}$$

$$1 - \prod_{m \in M} \prod_{l \in L} (1 - p_{b,l}^{m,k} \cdot y^m \cdot \alpha_{b,l}) \geq R, \quad \forall k \in K, \ \forall b \in B \tag{4}$$