SPP

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1 Sets

j	[0, 3]
$k\,(j)$	j =¿ heads[j]
$i\,(j)$	j =¿ tails[j]

2 Parameters

w_{ij}	weight of arc (i,j)	weights
b_i	node balance	1 if i=s; -1 if i=t; 0 o/w

3 Variables

x_{ij}	1 if (i,j) is on the shortest path; 0 o/w	$\in \mathbb{R}^+$

4 Model

$$\min \quad \sum_{j} \sum_{k(j)} w_{jk} x_{jk} \tag{1}$$

$$\text{s.t.} \quad \sum_{k(j)} x_{jk} + \sum_{i(j)} -x_{ij} = b_j \qquad \forall j \tag{2}$$

4.1 Objective

minimize path distance
minimize total path distance

4.2 Constraint: flowbal

flow balance constraints