Linear Programming, Zero-Forcing, and Maximally Diverse Optima

(Progress Documentation)

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\begin{aligned}
\text{minimize} \quad & \sum_{v \in V} s_v && \text{(1a)}\\
\text{subject to} \quad & s_v + \sum_{e \in \delta^-(v)} y_e = 1, \quad \forall v \in V, && \text{(1b)}\\
& x_u - x_v + (T+1)y_e \leq T, \quad \forall e = (u,v) \in E, && \text{(1c)}\\
& x_w - x_v + (T+1)y_e \leq T, \quad \forall e = (u,v) \in E,\ \forall w \in N(u) \setminus \{v\}, && \text{(1d)}\\
& s \in \{0,1\}^n,\ x \in \{0,\dots,T\}^n,\ y \in \{0,1\}^m && \text{(1e)}
\end{aligned}
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\begin{aligned}
\text{minimize} \quad & \sum_{v \in V} s_v && \text{(2a)}\\
\text{subject to} \quad & s_v + \sum_{e \in \delta^-(v)} y_e = 1, \quad \forall v \in V, && \text{(2b)}\\
& x_u - x_v + (T+1)y_e \leq T, \quad \forall e = (u,v) \in E, && \text{(2c)}\\
& x_w - x_v + (T+1)y_e \leq T, \quad \forall e = (u,v) \in E,\ \forall w \in N(u) \setminus \{v\}, && \text{(2d)}\\
& s \in \{0,1\}^n,\ x \in \{0,\dots,T\}^n,\ y \in \{0,1\}^m && \text{(2e)}
\end{aligned}
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