Travel Salesman Problem

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Muller, Tucker and Zemlin's Formulation

$$min \sum_{i \in V'} \sum_{j \in V' : i \neq j} c_{ij} \cdot x_{ij} \tag{1}$$

s.v

$$\sum_{i \in U : i \neq j} x_{ij} = 1 \qquad j \in V' \tag{2}$$

$$\sum_{j \in U : i \neq j} x_{ij} = 1 \qquad i \in V' \tag{3}$$

$$u_i - u_j + n \cdot x_{ij} \leq n - 1 \qquad i \in U,\ j \in U,\ i \neq j \tag{4}$$

$$x_{ij} \in \{0, 1\} \qquad (i, j) \in A' \tag{5}$$

$$u_i \geq 0 \qquad i \in U \tag{6}$$

where $V' = U \cup \{0\}$

- U = set of customer nodes;
- 0 = depot node;
- $n = |V'|$.