$$\min \quad \sum_{j \in J} c_j x_j$$

$$\text{subject to} \quad \sum_{j,k \in \pi^{-1}(i)} y_{jk} \geq 1, \quad \forall i \in I,$$

$$y_{jk} \leq x_j, \quad \forall j, k \in J \times J, (j < k),$$

$$y_{jk} \leq x_k, \quad \forall j, k \in J \times J, (j < k),$$

$$x_j = 0, 1, \quad \forall j \in J,$$

$$0 \leq y_{jk} \leq 1, \quad \forall j, k \in J \times J, (j < k).$$