

$$\text{Max } \sum_{k=1}^2 \sum_{i=1}^p \sum_{j=i+1}^p c_{ij} w_{ijk} - M$$

s.t.

$$w_{ijk} - y_{ik} \leq 0 \quad \forall i = 1, \dots, p \quad \forall j = i + 1, \dots, p \quad \forall k = 1, 2$$

$$w_{ijk} - y_{jk} \leq 0 \quad \forall i = 1, \dots, p \quad \forall j = i + 1, \dots, p \quad \forall k = 1, 2$$

$$-w_{ijk} + y_{ik} + y_{jk} \leq 1 \quad \forall i = 1, \dots, p \quad \forall j = i + 1, \dots, p \quad \forall k = 1, 2$$

$$\sum_{k=1}^2 y_{ik} = 1 \quad \forall i = 1, \dots, p$$

$$\sum_{i=1}^p y_{i1} - \sum_{i=1}^p y_{i2} - M = 0$$

$$\sum_{i=1}^p y_{i1} - \sum_{i=1}^p y_{i2} + M = 0$$

$$w_{ijk}, y_{ik}, y_{jk} \in \{0, 1\} \quad , \quad M \in \mathbb{Z}^+$$