Flow-shop problems with transportation delays

- maximal polynomially solvable:
  \[ F2[p_{ij} = 1; t_i \in \{ T_1, T_2 \}] | C_{\text{max}} \]
  Yu (1996) [5]
  \[ F2[t_{ik} = T] | C_{\text{max}} \]
  Johnson (1954) [3]
  \[ F[p_{ij} = 1; t_i \mid \sum C_i \]
  Brucker et al. (2004) [1]
  \[ F[p_{ij} = 1; t_i; r_i \mid \sum w_iU_i \]
  Single-machine problem
  \[ F[p_{ij} = 1; t_i; r_i \mid \sum w_iT_i \]
  Single-machine problem

- minimal NP-hard:
  \* \[ F2[p_{ij} = 1; t_i] | C_{\text{max}} \]
  \* \[ F2[r_i] | C_{\text{max}} \]
  Lenstra et al. (1977) [4]
  \* \[ F2[t_i \in \{ T_1, T_2 \}] | C_{\text{max}} \]
  Yu (1996) [5]
  \* \[ F3[| C_{\text{max}} \]
  Garey et al. (1976) [2]
  \* \[ F2[| L_{\text{max}} \]
  Lenstra et al. (1977) [4]
  \* \[ F2[\sum C_i \]
  Garey et al. (1976) [2]
  \* \[ F2[p_{ij} = 1; t_i; r_i | \sum C_i \]
  Brucker et al. (2004) [1]
  \* \[ F2[p_{ij} = 1; t_i | \sum w_iC_i \]
  Brucker et al. (2004) [1]

- minimal open:
  \[ F2[p_{ij} = 1; t_i \in \{ T_1, T_2 \}; r_i] | C_{\text{max}} \]
  \[ F2[p_{ij} = 1; t_i \in \{ T_1, T_2 \}; r_i | \sum C_i \]
  \[ F3[p_{ij} = 1; t_i \in \{ T_1, T_2 \}; r_i | \sum C_i \]
  \[ F2[p_{ij} = 1; t_i] | L_{\text{max}} \]
  \[ F3[p_{ij} = 1; t_{ik} | \sum C_i \]
  \[ F3[p_{ij} = 1; t_i] | \sum w_iC_i \]

- maximal open:
  \[ F[p_{ij} = 1; t_{ik} | \sum C_i \]
  \[ F[p_{ij} = 1; t_i] | \sum w_iU_i, \sum w_iT_i \]
  \[ F3[p_{ij} = 1; t_{ik}; r_i | \sum w_iU_i, \sum w_iT_i \]
References


