Multiprocessor task problems with parallel processors and preemption

- maximal polynomially solvable:
  \[ P_{\text{outtree}}; \text{pmtn}; r_i | C_{\text{max}} \] Lawler (1982) [21]
  \[ P_{\text{tree}}; \text{pmtn} | C_{\text{max}} \] Muntz & Coffman (1970) [30], Gonzalez & Johnson (1980) [16]
  \[ Q_{\text{chains}}; \text{pmtn} | C_{\text{max}} \] Horvath et al. (1977) [17]
  \[ P_{\text{inttree}}; \text{pmtn} | L_{\text{max}} \] Lawler (1982) [21]
  \[ P_{\text{in}} = p; \text{pmtn}; r_i | C_{\text{max}} \] Blazewicz et al. (1996) [4]
  \[ Q_{\text{2pprec}}; \text{pmtn}; r_i | L_{\text{max}} \] Lawler (1982) [21]
  \[ R_{\text{pmtn}}; r_i | L_{\text{max}} \] Lawler & Labertoule (1978) [23]
  \[ P_{\text{2p}} = p; \text{pmtn}; | \sum C_i \] Coffman et al. (2003) [10]
  \[ P_{\text{2p}} = p; \text{outtree}; \text{pmtn}; r_i | \sum C_i \] Lushchakova (2006) [28]
  \[ P_{\text{p}} = p; \text{pmtn}; r_i | \sum C_i \] Brucker & Kravchenko (2004) [8]
  \[ P_{\text{p}} = 1; \text{outtree}; \text{pmtn}; r_i | \sum C_i \] Brucker et al. (2002) [6], Huo & Leung (2005) [18]
  \[ P_{\text{p}} = p; \text{outtree}; \text{pmtn} | \sum C_i \] Brucker et al. (2002) [6]
  \[ Q_{\text{pmtn}} | \sum C_i \] Labertoule et al. (1984) [19]
  \[ P_{\text{p}} = p; \text{pmtn} | \sum w_i C_i \] McNaughton (1959) [29]
  \[ Q_{\text{p}} = p; \text{pmtn} | \sum U_i \] Baptiste et al. (2004) [3]
  \[ Q_{\text{p}} = p; \text{pmtn} | \sum U_i \] Baptiste et al. (2004) [3]
  \[ Q_{\text{p}} = p; \text{pmtn} | \sum T_i \] Baptiste et al. (2004) [3]
  \[ P_{\text{p}} = 1; \text{pmtn}; r_i | \sum w_i C_i \] Baptiste et al. (2004) [3]
  \[ P_{\text{p}} = p; \text{pmtn} | \sum T_i \] Baptiste et al. (2004) [3]
  \[ P_{\text{p}} = 1; \text{pmtn}; r_i | \sum w_i C_i \] Baptiste et al. (2004) [3]

- maximal pseudopolynomially solvable:
  \[ P_{\text{pmtn}} | \sum w_i C_i \] McNaughton (1959) [29], Lawler et al. (1989) [24]
  \[ Q_{\text{pmtn}} | \sum w_i U_i \] Lawler (1979) [20], Lawler & Martel (1989) [25]

- minimal NP-hard:
  \[ P_{\text{p}} = 1; \text{pmtn}; \text{size} | C_{\text{max}} \] Drozdowski (1992) [11]
  \* \[ P_{\text{inttree}}; \text{pmtn}; r_i | C_{\text{max}} \] Lenstra (-) [26]
  \* \[ P_{\text{p}} = 1; \text{prec}; \text{pmtn} C_{\text{max}} \] Ullman (1976) [33]
  \* \[ R_{\text{2chains}}; \text{pmtn} | C_{\text{max}} \] Lenstra (-) [26]
  \* \[ P_{\text{2outtree}}; \text{pmtn} | L_{\text{max}} \] Lenstra (-) [26]
  \* \[ P_{\text{pmtn}}; r_i | \sum C_i \] Du et al. (1990) [14]
  \* \[ P_{\text{pmtn}}; \text{size} | \sum C_i \] Drozdowski & Dell'Olmo (2000) [12]
  \* \[ P_{\text{pmtn}}; r_i | \sum C_i \] Brucker & Kravchenko (2004) [8]
  \* \[ P_{\text{2chains}}; \text{pmtn} | \sum C_i \] Du et al. (1991) [15]
  \* \[ R_{\text{pmtn}} | \sum C_i \] Sitters (2001) [31]
  \* \[ P_{\text{2pmtn}} | \sum w_i C_i \] Bruno et al. (1974) [9]
  \* \[ P_{\text{p}} = p; \text{pmtn}; r_i | \sum w_i C_i \] Leung & Young (1990A) [27]
  \* \[ P_{\text{pmtn}} | \sum w_i C_i \] Lenstra (-) [26]
  \* \[ P_{\text{2p}} = 1; \text{chains}; \text{pmtn} | \sum w_i C_i \] Timkovsky (2003) [32], Du et al. (1991) [15]
  \* \[ P_{\text{pmtn}}; r_i | \sum w_i C_i \] Labertoule et al. (1984) [19]
  \* \[ P_{\text{pmtn}} | \sum U_i \] Lawler (1983) [22]
  \* \[ P_{\text{pmtn}}; r_i | \sum U_i \] Du et al. (1992) [13]
  \* \[ P_{\text{2p}} = 1; \text{chains}; \text{pmtn} | \sum U_i \] Baptiste et al. (2004) [3]
  \* \[ R_{\text{pmtn}} | \sum U_i \] Sitters (2001) [31]
  \* \[ P_{\text{p}} = p; \text{pmtn} | \sum w_i U_i \] Brucker & Kravchenko (1999) [7]
  \* \[ P_{\text{pmtn}} | \sum w_i U_i \] Single-machine problem

- minimal open:
  \[ P_{\text{2p}} = 1; \text{chains}; \text{pmtn}; \text{size} | C_{\text{max}} \]
  \[ Q_{\text{2p}} = p; \text{pmtn}; \text{size} | \sum C_i \]
  \[ P_{\text{2p}} = 1; \text{pmtn}; \text{size} | \sum U_i \]

- maximal open:
  \[ Q_{\text{mprec}}; \text{pmtn}; r_i | C_{\text{max}} \]
  \[ R_{\text{mpnt}}; r_i | \sum U_i \]
  \[ Q_{\text{p}} = p; \text{prec}; \text{pmtn}; r_i | \sum \sum w_i U_i \]
  \[ P_{\text{p}} = 1; \text{pmtn}; r_i | \sum \sum C_i \]
  \[ Q_{\text{p}} = p; \text{pmtn}; r_i | \sum \sum w_i T_i \]
  \[ Q_{\text{p}} = p; \text{pmtn}; r_i | \sum \sum w_i C_i \]
  \[ Q_{\text{p}} = p; \text{pmtn}; r_i | \sum \sum w_i C_i \]
References


