

## Multipurpose machine problems

- **maximal polynomially solvable:**

$QMPPM    \sum C_i$	Horn (1973) [6], Bruno et al. (1974) [3]
$PMPM   p_i = 1; r_i   \sum w_i U_i$	Brucker et al. (1997) [2]
$QMPPM   p_i = 1   \sum w_i U_i$	Brucker et al. (1997) [2]
$PMPM   p_i = 1; r_i   \sum w_i T_i$	Brucker et al. (1997) [2]
$QMPPM   p_i = 1   \sum w_i T_i$	Brucker et al. (1997) [2]

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- **minimal NP-hard:**

$PMPM2   C_{max}$	Lenstra et al. (1977) [10]
$PMPM2   chains; p_i = 1   C_{max}$	Brucker et al. (1997) [1]
* $PMPM   C_{max}$	Garey & Johnson (1978) [5]
* $PMPM  intree; p_i = 1; r_i   C_{max}$	Brucker et al. (1977) [1]
* $PMPM  prec; p_i = 1   C_{max}$	Ullman (1975) [12]
* $PMPM2  chains   C_{max}$	Du et al. (1991) [4]
* $QMPPM  chains; p_i = 1   C_{max}$	Kubiak (1988) [7]
* $PMPM  outtree; p_i = 1   L_{max}$	Brucker et al. (1977) [1]
* $PMPM  prec; p_i = 1   \sum C_i$	Lenstra & Rinnooy Kan (1978) [9]
* $PMPM2  chains   \sum C_i$	Du et al. (1991) [4]
* $PMPM2  r_i   \sum C_i$	Single-machine problem
$PMPM2   \sum w_i C_i$	Bruno et al. (1974) [3]
* $PMPM   \sum w_i C_i$	Lenstra (-) [8]
* $PMPM2  chains; p_i = 1   \sum w_i C_i$	Timkovsky (1998) [11]
* $PMPM2  chains; p_i = 1   \sum U_i$	Single-machine problem
* $PMPM2  chains; p_i = 1   \sum T_i$	Single-machine problem

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- **minimal open:**

$QMPPM2   p_i = 1; r_i   C_{max}$	$QMPPM2   p_i = 1; r_i   \sum C_i$
$PMPM2   chains; p_i = 1   \sum C_i$	

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- **maximal open:**

$QMPPM  tree; p_i = 1; r_i   \sum C_i$	$QMPPM   p_i = 1; r_i   \sum w_i U_i$
$QMPPM  prec; p_i = 1; r_i   \sum C_i$	$QMPPM   p_i = 1; r_i   \sum w_i T_i$

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## References

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