

Stable Matching / Marriage problem

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n men

n women

$$M = \{m_1, m_2, \dots, m_n\}$$

$$W = \{w_1, w_2, \dots, w_n\}$$

$n=2$

$$M = \{BP, BBT\}$$

$$W = \{JA, AJ\}$$

Examples

M: matching

PM: Perfect matching



M: ✓
PM: X



M: ✓
PM: X



M: ✓
PM: X



M: ✓
PM: X

Def. (Matching) A subset $S \subseteq M \times W = \{(m, w) \mid m \in M, w \in W\}$

is a matching IF

(i) $\forall w \in W, \exists$ at most one man s.t. $(m, w) \in S$

AND

(ii) $\forall m \in M, \exists$ at most one woman s.t. $(m, w) \in S$

Def. (Perfect Matching)

Same as above except
replace at most by
Exactly