

Sep 8

# Stable matching

$n = 2$

$M = \{BP, BBT\}$   $W = \{AJ, JA\}$

→ Perfect matching

Preference list	$L_{JA}: BP > BBT$	$L_{BP}: AJ > JA$
	$L_{AJ}: BP > BBT$	$L_{BBT}: AJ > JA$

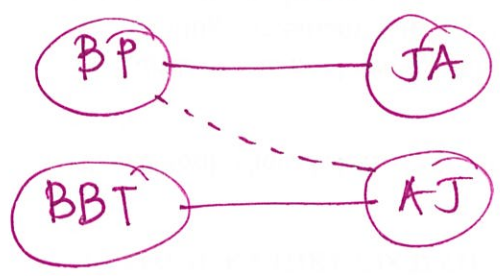
Def: (Preference list)  $\forall w \in W, L_w$ : Total ranking of all  $n$  me  
 $\forall m \in M, L_m$ : \_\_\_\_\_ wom

general  $n$  (Q1) How many preference list:  $2^n$

(Q2) How many elements in total across all preference list?

$2^n \times n = 2n^n = \Theta(n^n)$   
↑  
pref list

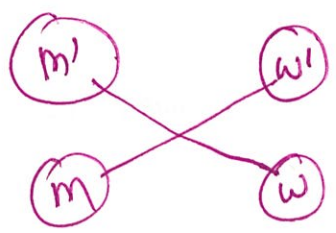
## Stable matching



Def: A stable matching is a perfect matching with NO instability.

Def: (Instability) Given  $2n$  pref. list AND a ~~perfect~~ perfect matching  $S \subseteq M \times W$ ,

a pair  $(m', w')$  is an instability IF



(1)  $m' > m$  in  $L_{w'}$

AND  
 (2)  $w' > w$  in  $L_{m'}$ .