Spring 2022

## 1 Stable Matching

Consider the set of jobs  $J = \{1, 2, 3\}$  and the set of candidates  $C = \{A, B, C\}$  with the following preferences.

Jobs	Candidates							
1	A	>	В	>	С			
2	В	>	A	>	С			
3	A	>	В	>	С			

Candidates	Jobs					
A	2	>	1	>	3	
В	1	>	3	>	2	
С	1	>	2	>	3	

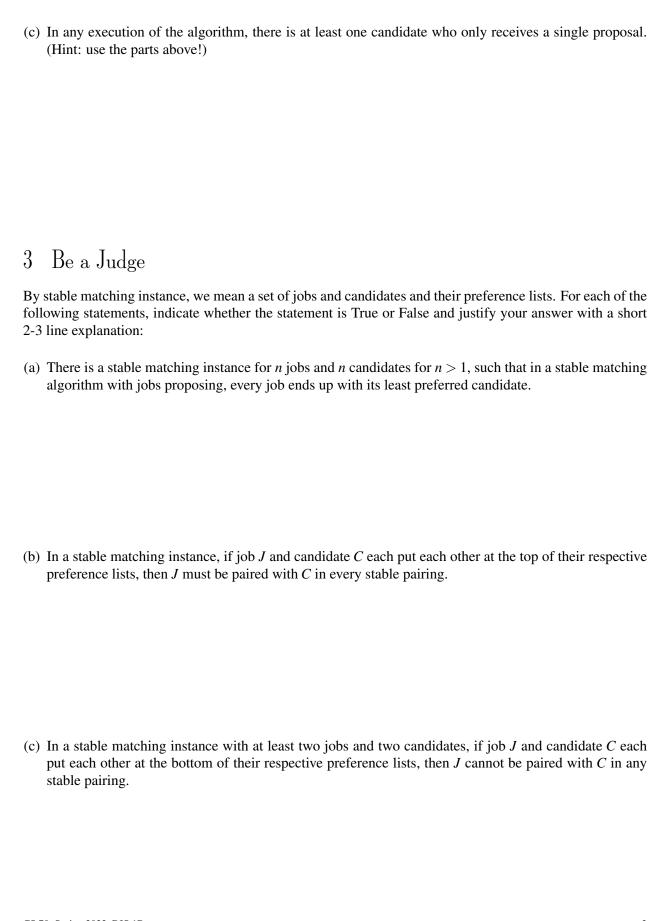
Run the traditional propose-and-reject algorithm on this example. How many days does it take and what is the resulting pairing? (Show your work.)

## 2 Propose-and-Reject Proofs

Prove the following statements about the traditional propose-and-reject algorithm.

(a) In any execution of the algorithm, if a candidate receives a proposal on day *i*, then she receives some proposal on every day thereafter until termination.

(b) In any execution of the algorithm, if a candidate receives no proposal on day i, then she receives no proposal on any previous day j,  $1 \le j < i$ .



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