

Assignment #1

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Chapter 1 Exercise 1, 2, 3

Ex 1 False.

Suppose 1, 2 are men and 3, 4 are women, and the order of their preference is:

	1st	2nd
1	3	4
2	4	3
3	2	1
4	1	2

Then we can easily find that for any human, the people he/she prefers first doesn't prefer her first, and then we can say that *there are no stable matchings containing a pair (m, w) such that m is ranked first on the preference list of w and w is ranked first on the preference list of m .*

Ex 2 True.

Assume the proposition is false, which means there is a matching that doesn't contain (m, w) , then it is not a stable matching since it will lead m and w be unstable.

Ex 3 (b).

Suppose $n = 2$ and the associated ratings of \mathcal{A} 's TV shows are 1, 3 and those of \mathcal{B} 's TV shows are 2, 4.

One possible situation is $S = (1, 3)$ and $T = (2, 4)$ (or equivalently $S = (3, 1)$ and $T = (4, 2)$), in which case \mathcal{A} can change S to $(3, 1)$ to win more slots.

Another possible situation is $S = (1, 3)$ and $T = (4, 2)$ (or equivalently $S = (3, 1)$ and $T = (2, 4)$), in which case \mathcal{B} can change T to $(2, 4)$ to win more slots.

As mentioned above, there is no stable pair of schedules in the given associated ratings.