First HomeworR: Exercise 1.1、1.2

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1. False.

Below I give a counterexample:

Suppose $n=3$. and we have the set of men $M=\{m_1, m_2, m_3\}$ and women $W=\{w_1, w_2, w_3\}$

Let the chart show these three men's prefevence:

m_1:	$w_1 > w_2 > w_3$
m_2:	$w_2 > w_3 > w_1$
m_3:	$w_3 > w_1 > w_2$

And the women's prefevence:

w_1:	$m_2 > m_3 > m_1$
w_2:	$m_3 > m_1 > m_2$
w_3:	$m_1 > m_2 > m_3$

Now we suppose the following stable matching:

$S=\{(m_1, w_1), (m_2, w_2), (m_3, w_3)\}$,

in which each men is with his best choice, while each women is with her worst choice.

2. Obviously true
Suppose when there's a stable matching S' which doesn't include the pair (m, w)
Then both m and w prefer each other than their current partner
Hence the pair (m, w) contradicts with the claim "stable"