1 Two-sided Matching

3 young men (m_1, m_2, m_3) and 3 young women (w_1, w_2, w_3) have been assigned to a blind date group. They need to decide whom they want to date with. Basically, each man or woman has a preference over women and men. Their preferences are listed below.

$\succ_{m_1}: w_2 \succ w_1 \succ w_3$	$\succ_{w_1}: m_1 \succ m_3 \succ m_2$
$\succ_{m_2}: w_1 \succ w_3 \succ w_2$	$\succ_{w_2}: m_3 \succ m_1 \succ m_2$
$\succ_{m_3}: w_1 \succ w_2 \succ w_3$	$\succ_{w_3}: m_1 \succ m_3 \succ m_2$

1.1 Deferred Acceptance (2pt)

Compute the result of man-proposing and woman-proposing deferred acceptance (using (m_i, w_j) to represent a matching pair).

1.2 Stable Matching (2pt)

Whether the two matching results in 1.1 are stable? Why? Write down all stable matching results.

1.3 Truthfulness (2pt)

In man-proposing and woman-proposing deferred acceptance, whether one of them (three men and three women) can be matched to a better person by misreporting his/her preference? Why?

2 Double Auction(2pt)

Consider a double auction where each seller sells one item and each buyer gets at most one item. All the items are identical. Suppose the sellers' asks are $(2, 3, 5, 9, 15, 17)$ and the buyers' bids are $(7, 9, 12, 17, 19, 20)$. Compute the social welfare of the allocations generated by VCG and McAfee's mechanisms respectively.