HW3

Problem 4: by end, everyone is engaged.

Lemma: algorithm ends with pairs.

Proof: (contradiction) Suppose man M proposed to every women. By lemma, every women has someone paired with, n women have n men not including M. So there is at least n+1 men. Contradiction.

Problem 6:

Proof: suppose pairs (m, w) and (m', w') but m preters w' and w' preters m.

By the algorithm, m proposed to w last. since m preters w', m must have proposed to w' bebre w. At that time, assume w' was engaged to m'', then w' preters m' over m'' and m'' over m, this means that m' preters m' over m, contradicts our original assumption.

Problem 5: P - man - m A - women - w

Proof: assume w' occurs before w on m's list, then m proposed to w' before. W' must have rejected m for someone she prefers. Then w' likes her final partner the most between former proposals, prefers him to m.