Challenge Problem – 4

This is a repeat of the third challenge problem from challenge problem set number 4.

1. There are \( n \) men and \( n \) women. Each man likes \( d \) women and each woman likes \( d \) men (“like” is mutual; if Joe likes Jane then Jane likes Joe). A round of dance requires a pairing of all the men and women such that the persons in every pair like each other. Prove that it is possible to conduct \( d \) rounds of dances such that no pair is repeated.