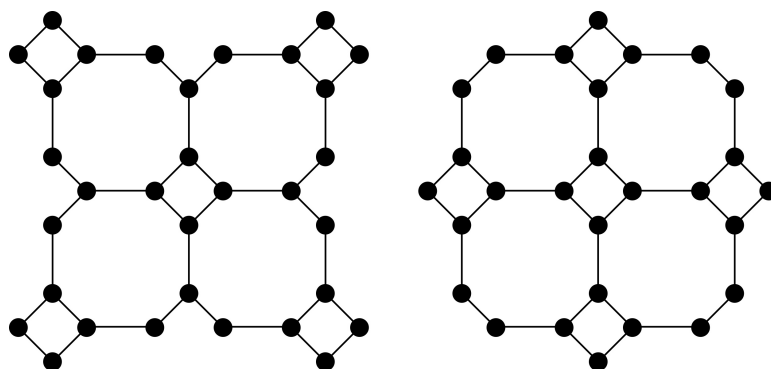


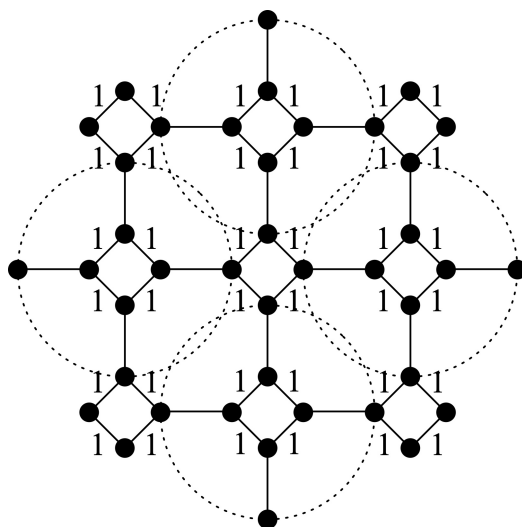
Problems for Lecture #1

Note: Lecture notes are posted at <http://jamespropp.org/its1.pdf>.

1. Add appropriate vertices and edges of weight 1 and use Δ -factors to count the (perfect) matchings of the two fortress graphs shown below.



I'll get the first one started for you:



Now apply the spider move in reverse to subgraphs along the north, south, east, and west edges of the graph (inside the four dotted circles) to turn

the picture into a weighted Aztec diamond graph of order 3 and proceed from there, using spider moves (and pruning and contracting) to reduce the weighted Aztec diamond graph of order 3 to a weighted Aztec diamond graph of order 2, and to reduce that weighted Aztec diamond graph of order 2 to a weighted Aztec diamond graph of order 1, along the lines of the calculation of the number of matchings of the 6-by-6 grid graph given in the lecture notes.

2. Use Ciucu factorization to count the matchings of the graphs from problem 1, as colored below.

