



Above is a solution to the *Peaceable Armies of Queens* problem where we must place an equal number of white and black queens on an n by n chess board, such that no white queen attacks a black queen (and vice versa). Note that queens of different colours attack each other if they are in the same row, or the same column, or the same diagonal of the board. The figure above is a solution for a 12 by 12 board that has armies of size 21.

- (a) Suggest how we might represent and solve the above problem.