

Homework 2: The  $n$ -Queens Problem*Due Tuesday, Week 3, at the start of class**UCSB 2015*

Work on these problems for 90m/until you solve everything/longer if you're interested!

1. (a) Solve the  $n$ -queens puzzle for  $n = 5$ , using the methods described in class. How many different solutions can you get?
- (b) Solve the  $n$ -queens puzzle for  $n = 6$ . (You will not be able to use the methods described in class, because 6 is both even and a multiple of 3; but you can still solve this problem!) How many solutions can you get for this problem? (Surprisingly, there are fewer solutions for 6 than for 5!)
- (c) The  **$n$ -queens domination puzzle** is a related problem: given a  $n \times n$  chessboard, what is the fewest number of queens needed to insure that every cell in the chessboard is guarded by at least one queen? Answer this puzzle for some small values of  $n$ , and if you have time try  $n = 8$ .