Queen of Queens

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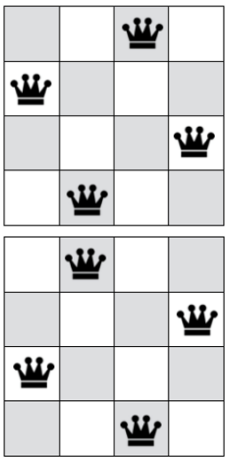
C++ — 2 sec — 512 MB

For many centuries, the Guild of Sorcerers have maintained a healthy alliance with the Amazons. Their trade of secrets and tea leaves has always been mutually beneficial, and the Chief Sorcerer is seeking to expand the terms of their agreement.

The Amazonian Queen Ada has been invited to the palatial hall that is the guild's home. In her honour, the spellsmiths have forged a sumptuous **n** by **n** chessboard from black ebony and white ivory, while the warlocks have plundered **n** statuettes of the Queen Ada.



The queens have been arranged upon the chessboard so that no queen is attacking any other queen. Namely, no two queens are in the same row, column, or diagonal.

Unfortunately, Queen Ada has seen this spectacle many times before. To make their arrangement different, the Guild of Sorcerer's want to enumerate every possible valid positioning of the **n** queens.

INPUT You will be given a single integer **n** - the dimensions of the chessboard.

$1 \leq \mathbf{n} \leq 12$

OUTPUT First, output the number of different valid positionings for the **n** queens. Then, output each positioning on separate lines. A positioning is given by **n** numbers, the **i**th of which is the row occupied by the queen in the **i**th column. *The orderings must be given in lexicographic order.*

SAMPLE For example, consider placing 4 queens on a 4x4 chessboard. There are only 2 valid arrangements, which are shown above.

INPUT	OUTPUT
3	0
4	2 1 3 0 2 2 0 3 1