Holey N-Queens (Batman)

Problem ID: holeynqueensbatman
CPU Time limit: 7 seconds
Memory limit: 1024 MB

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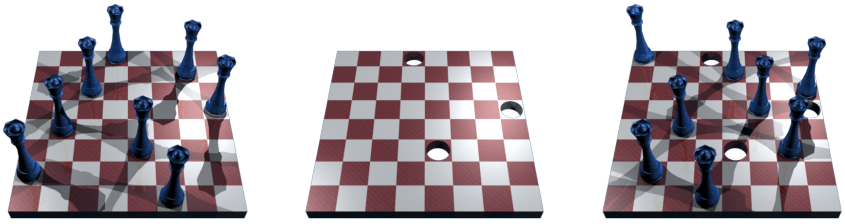
The N-queens problem is the problem of placing N queens on a $N \times N$ chessboard so that no queen shares a row, column or a diagonal with any other queen. Essentially, we are trying to place the queens without any queen threatening another. For example, the first image below (without holes in the board) is a solution to the 8-queens problem.



For this problem, consider the problem we'll call the 'holey N-queens problem'. Instead of having an everyday chessboard (of arbitrary size), your chessboard is like the second image above (without queens): it has holes through some of the squares. You can't place a queen on a square that has a hole, but a queen can threaten another even if there is a hole on the path between them. Given a holey chessboard, you must find placements for the N queens so that no queen threatens another. The third image above (with holes and queens) shows one such solution.

Input

Input consists of up to 1 000 board descriptions. Each description starts with a line containing a pair of integers, $3 \leq N \leq 12$ and $0 \leq M \leq N^2$, indicating respectively the size of one side of the board, and the number of holes. The next M lines each describe the location of a unique hole in the board. A hole is described by its row and column, each in the range $[0, N-1]$. The end of input is marked by values of zero for N and M.

Output

For each problem description, print out the number of unique N-queens solutions that are possible. Two solutions are considered different if any space is occupied by a queen in one solution but not in the other.

Sample Input 1

```
8 0
8 3
0 3
5 4
3 7
0 0
```

Sample Output 1

```
92
50
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