What is the N Queens problem?

To understand what this problem is, let us start with the origin, counting the 92 solutions to the 8 queens' problem.

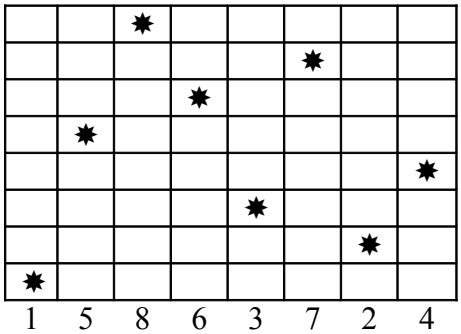
How many ways to place 8 Queens (chess) on a 8x8 chessboard?

The eight queens' puzzle is the problem of putting eight chess queens on an 8x8 chessboard such that none of them is able to capture any other using the standard chess queen's moves. That is to say, no two queens should share the same row, column, or diagonal. The generalised problem of placing n "non-dominating" queens on an n by n chessboard was posed as early as 1850.

The eight queens' problem has 92 solutions or 12 distinct solutions if symmetry operations such as rotations and reflections of the board are taken into consideration.

1 5 8 6 3 7 2 4	3 6 8 1 5 7 2 4	5 1 4 6 8 2 7 3	6 3 1 8 5 2 4 7
1 6 8 3 7 4 2 5	3 6 8 2 4 1 7 5	5 1 8 4 2 7 3 6	6 3 5 7 1 4 2 8
1 7 4 6 8 2 5 3	3 7 2 8 5 1 4 6	5 1 8 6 3 7 2 4	6 3 5 8 1 4 2 7
1 7 5 8 2 4 6 3	3 7 2 8 6 4 1 5	5 2 4 6 8 3 1 7	6 3 7 2 4 8 1 5
2 4 6 8 3 1 7 5	3 8 4 7 1 6 2 5	5 2 4 7 3 8 6 1	6 3 7 2 8 5 1 4
2 5 7 1 3 8 6 4	4 1 5 8 2 7 3 6	5 2 6 1 7 4 8 3	6 3 7 4 1 8 2 5
2 5 7 4 1 8 6 3	4 1 5 8 6 3 7 2	5 2 8 1 4 7 3 6	6 4 1 5 8 2 7 3
2 6 1 7 4 8 3 5	4 2 5 8 6 1 3 7	5 3 1 6 8 2 4 7	6 4 2 8 5 7 1 3
2 6 8 3 1 4 7 5	4 2 7 3 6 8 1 5	5 3 1 7 2 8 6 4	6 4 7 1 3 5 2 8
2 7 3 6 8 5 1 4	4 2 7 3 6 8 5 1	5 3 8 4 7 1 6 2	6 4 7 1 8 2 5 3
2 7 5 8 1 4 6 3	4 2 7 5 1 8 6 3	5 7 1 3 8 6 4 2	6 8 2 4 1 7 5 3
2 8 6 1 3 5 7 4	4 2 8 5 7 1 3 6	5 7 1 4 2 8 6 3	7 1 3 8 6 4 2 5
3 1 7 5 8 2 4 6	4 2 8 6 1 3 5 7	5 7 2 4 8 1 3 6	7 2 4 1 8 5 3 6
3 5 2 8 1 7 4 6	4 6 1 5 2 8 3 7	5 7 2 6 3 1 4 8	7 2 6 3 1 4 8 5
3 5 2 8 6 4 7 1	4 6 8 2 7 1 3 5	5 7 2 6 3 1 8 4	7 3 1 6 8 5 2 4
3 5 7 1 4 2 8 6	4 6 8 3 1 7 5 2	5 7 4 1 3 8 6 2	7 3 8 2 5 1 6 4
3 5 8 4 1 7 2 6	4 7 1 8 5 2 6 3	5 8 4 1 3 6 2 7	7 4 2 5 8 1 3 6
3 6 2 5 8 1 7 4	4 7 3 8 2 5 1 6	5 8 4 1 7 2 6 3	7 4 2 8 6 1 3 5
3 6 2 7 1 4 8 5	4 7 5 2 6 1 3 8	6 1 5 2 8 3 7 4	7 5 3 1 6 8 2 4
3 6 2 7 5 1 8 4	4 7 5 3 1 6 8 2	6 2 7 1 3 5 8 4	8 2 4 1 7 5 3 6
3 6 4 1 8 5 7 2	4 8 1 3 6 2 7 5	6 2 7 1 4 8 5 3	8 2 5 3 1 7 4 6
3 6 4 2 8 5 7 1	4 8 1 5 7 2 6 3	6 3 1 7 5 8 2 4	8 3 1 6 2 5 7 4
3 6 8 1 4 7 5 2	4 8 5 3 1 7 2 6	6 3 1 8 4 2 7 5	8 4 1 3 6 2 7 5
			92 SOLUTIONS

The coding system can be explained by an example



1 5 8 6 3 7 2 4

This problem is well known as “EIGHT QUEENS PUZZLE” with a lot of hits in Internet search engines.
Notice that the 92 solutions are a subset of all 8! (40 320) permutations of 1 2 3 4 5 6 7 8

Know solutions for N=4 to 25

N	Solutions	Record owner	Ref.
4	2		
5	10		
6	4		
7	40		
8	92		
9	352		
10	724		
11	2,680		
12	14,200		
13	73,712		
14	365,596		
15	2,279,184		
16	14,772,512		
17	95,815,104		
18	666,090,624		
19	4,968,057,848		
20	39,029,188,884		
21	314,666,222,712		
22	2,691,008,701,644		
23	24,233,937,684,440	INRIA	
24	227,514,171,973,736	Takaken	
25	2,207,893,435,808,352	INRIA	http://proactive.objectweb.org

Assignment

The aim of this assignment is to write a master-slave ProActive program solving the N-Queen problem for a given N. The number of slave to create and their respective host should be specified in a deployment file.