

Trafigura Programming Problem

Please submit a solution to the following problem. Solutions will not be accepted in any of C/C++/C# or Java; other than these there is no restriction on the programming language. The reason for this restriction is that we are seeking developers who either know a range of languages through a wider interest in computing, or at least can quickly get over the hurdle of learning another language in order to solve this problem.

Note that although Java and C# are excluded, we will accept solutions in any of the other languages that run on the JVM or CLR.

No consideration will be given to the time taken for a solution to be written. We would much rather see a good solution after some weeks than a poor one returned quickly. We would expect a good developer to be able to complete this task in no more than three hours, using no more than 500 lines of code, possibly much less. If you find yourself going beyond these limits you are almost certainly taking the wrong approach.

When solving this problem, please favour clarity of code over performance. Shaving fractions off execution time at the cost of code complexity is not desirable. One solution in Python took 20 minutes to run, however even one hour would be perfectly acceptable.

Candidates who are invited back after this stage can expect to undergo a thorough review of their code.

Chess Problem

The problem is to find all unique configurations of a set of normal chess pieces on a chess board with dimensions $M \times N$ where none of the pieces is in a position to take any of the others. Assume the colour of the piece does not matter, and that there are no pawns among the pieces.

Write a program which takes as input:

- The dimensions of the board: M, N .
- The number of pieces of each type (King, Queen, Bishop, Rook and Knight) to try and place on the board.

As output, the program should list all the unique configurations to the console for which all of the pieces can be placed on the board without threatening each other.

When returning your solution, please provide with your answer the total number of unique configurations for a 6×9 board with 2 Kings, 1 Queen, 1 Bishop, 1 Rook and 1 Knight.

Examples

Input: 3×3 board containing 2 Kings and 1 Rook.

Output:

K		K
	R	

K		
		R
K		

		K
R		
		K

	R	
K		K

Input: 4×4 board containing 2 Rooks and 4 Knights.

Output:

	N		N
		R	
	N		N
R			

	N		N
R			
	N		N
		R	

R			
	N		N
		R	
	N		N

		R	
	N		N
R			
	N		N

	R		
N		N	
			R
N		N	

			R
N		N	
	R		
N		N	

N		N	
			R
N		N	
	R		

N		N	
	R		
N		N	
			R