Hamiltonian Cycles

A *Hamiltonian cycle* in a directed graph is a closed path that passes through each vertex exactly once. Hamiltonian cycles can be generated using the following CLINGO program:

```
{in(X,Y)} :- edge(X,Y).

:- 2 { <Y> : in(X,Y)}, vertex(X).
:- 2 { <X> : in(X,Y)}, vertex(Y).

r(X) :- in(v0,X).
r(Y) :- r(X), in(X,Y).

:- not r(X), vertex(X).

#hide. #show in(X,Y).
```

Problem 37^e. In the blocks world, n blocks can be stacked one on top of another, forming towers one block thick. Each tower is based on the table. For instance, if $n = 3$ then 13 configurations of blocks are possible:

```
1         2         1         3         2         3
2         1         3         1         3         2
3         3         2         2         1         1
---       ---       ---       ---       ---       ---


1         2         1         3         2         3
 2 3      1 3       3 2       1 2       3 1       2 1       1 2 3
-----     -----     -----     -----     -----     -----     -------
```

Write a CLINGO program generating all configurations of n blocks.