Test case:

1 ?- moves(4,3,X).

The answer is:[state(4, 3), state(4, 0), state(1, 3), state(1, 0), state(0, 1), state(4, 1), state(2, 3)]

X = [state(2, 3), state(4, 1), state(0, 1), state(1, 0), state(1, 3), state(4, 0), state(4, 3)] ;

The answer is:[state(4, 3), state(4, 0), state(1, 3), state(1, 0), state(0, 1), state(0, 0), state(0, 3), state(3, 0), state(3, 3), state(4, 2), state(0, 2), state(2, 0)]

X = [state(2, 0), state(0, 2), state(4, 2), state(3, 3), state(3, 0), state(0, 3), state(0, 0), state(0, 1), state(..., ...)|...] ;

The answer is:[state(4, 3), state(4, 0), state(1, 3), state(1, 0), state(0, 0), state(0, 3), state(3, 0), state(3, 3), state(4, 2), state(0, 2), state(2, 0)]

X = [state(2, 0), state(0, 2), state(4, 2), state(3, 3), state(3, 0), state(0, 3), state(0, 0), state(1, 0), state(..., ...)|...] ;

The answer is:[state(4, 3), state(4, 0), state(1, 3), state(0, 3), state(3, 0), state(3, 3), state(4, 2), state(0, 2), state(2, 0)]

X = [state(2, 0), state(0, 2), state(4, 2), state(3, 3), state(3, 0), state(0, 3), state(1, 3), state(4, 0), state(..., ...)] ;

The answer is:[state(4, 3), state(4, 0), state(0, 0), state(0, 3), state(3, 0), state(3, 3), state(4, 2), state(0, 2), state(2, 0)]

X = [state(2, 0), state(0, 2), state(4, 2), state(3, 3), state(3, 0), state(0, 3), state(0, 0), state(4, 0), state(..., ...)] ;

The answer is:[state(4, 3), state(0, 3), state(3, 0), state(3, 3), state(4, 2), state(4, 0), state(1, 3), state(1, 0), state(0, 1), state(4, 1), state(2, 3)]

X = [state(2, 3), state(4, 1), state(0, 1), state(1, 0), state(1, 3), state(4, 0), state(4, 2), state(3, 3), state(..., ...)|...] ;

The answer is:[state(4, 3), state(0, 3), state(3, 0), state(3, 3), state(4, 2), state(0, 2), state(2, 0)]

X = [state(2, 0), state(0, 2), state(4, 2), state(3, 3), state(3, 0), state(0, 3), state(4, 3)] ;

The answer is:[state(4, 3), state(0, 3), state(3, 0), state(0, 0), state(4, 0), state(1, 3), state(1, 0), state(0, 1), state(4, 1), state(2, 3)]

X = [state(2, 3), state(4, 1), state(0, 1), state(1, 0), state(1, 3), state(4, 0), state(0, 0), state(3, 0), state(..., ...)|...] ;

The answer is:[state(4, 3), state(0, 3), state(0, 0), state(4, 0), state(1, 3), state(1, 0), state(0, 1), state(4, 1), state(2, 3)]

X = [state(2, 3), state(4, 1), state(0, 1), state(1, 0), state(1, 3), state(4, 0), state(0, 0), state(0, 3), state(..., ...)] ;

No

The screenshot:

