



⊖: Same direction move

⊕: Contra direction move

Termination point is annotated with fold font

Suppose there is a row of 5 adjacent boxes, with a cat in the 1st box and a mouse in the 5th box. At each 'tick' the cat and the mouse both jump to a random box next to them. On the 1st tick the cat must jump to box 2 and the mouse to box 4 but on the next ticks they may jump to the box they started in or to box 3.

When the cat and mouse are in the same box the cat catches the mouse and the Markov chain terminates. Because there is an odd number of boxes between the cat and mouse it's easy to see that they will not jump past each other

The transition probability matrix is:

	1, 3	1, 5	2, 4	3, 5	End
1, 3	0	0	0.5	0	0.5
1, 5	0	0	1	0	0
2, 4	0.25	0.25	0	0.25	0.25
3, 5	0	0	0.5	0	0.5
End	0	0	0	1	