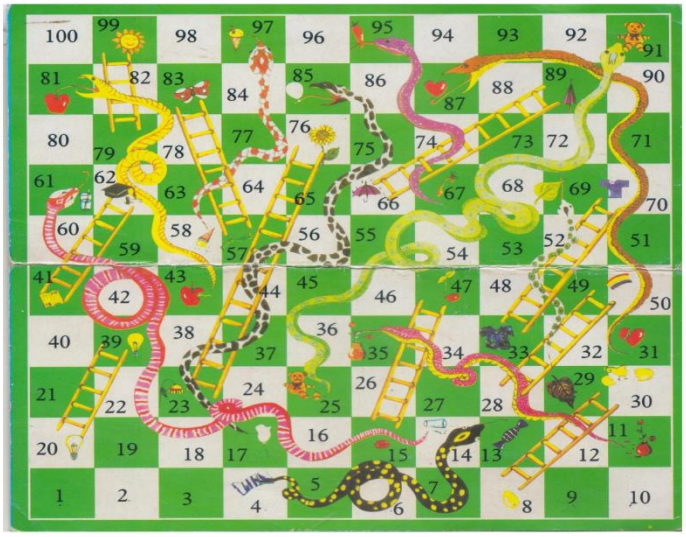


Fig. 1 A standard Snakes and Ladders

RULES:

- The game of Snakes and Ladders is played on a board with a 10 × 10 grid.
- Players roll a single die and moving the corresponding number of squares.
- If the player lands you on the head of the Snake, you must go back to the square at the Snake tail.
- If you land at the bottom of a Ladder, you instantly climb to the top of that Ladder
- If a player rolls a die that would advance them beyond square100, they stay at the same place.

MARKOV PROCESS:

- each square is a state.
- square of 100 as the only absorbing state
- with no memory of previous states is known

Probability Distribution:

$$\pi_i = (0, 0, \dots, 1) \quad \text{for states } i = 0, 1, \dots, n.$$

R, representing all of the transitions.

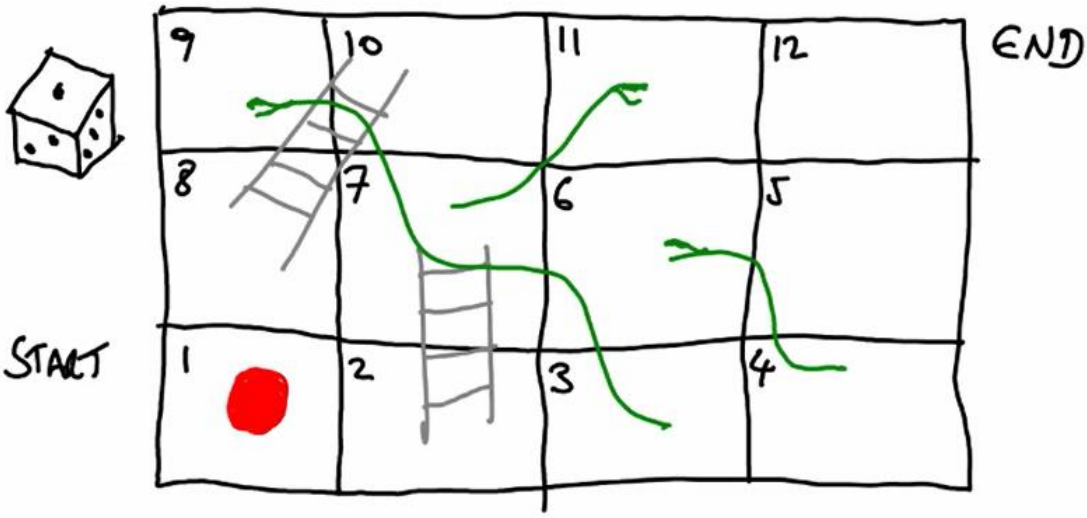
R= {(8, 30), (15, 47), (20, 39), (23, 76), (28, 50), (33, 70), (41, 62), (57, 83), (66, 89), (79, 99), (13, 4), (35, 11), (61, 14), (69, 32), (81, 43), (85, 17), (87, 31), (91, 25), (95, 67), (97, 58)}.

six equally probable options: rolling a 1, 2, 3, 4, 5 or 6.

transition matrix.

$$P_{101\times101} = \begin{array}{c} \\ 0 \\ 1 \\ 2 \\ \vdots \\ \vdots \\ 97 \\ 98 \\ 99 \\ 100 \end{array} \begin{array}{c} \begin{array}{ccccccccccccccccccccc} 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & \cdots & 35 & \cdots & 61 & \cdots & & 97 & 98 & 99 & 100 & \end{array} \\ \begin{pmatrix} 0 & \frac{1}{6} & \frac{1}{6} & \frac{1}{6} & \frac{1}{6} & \frac{1}{6} & \frac{1}{6} & 0 & 0 & 0 & \cdots & 0 & 0 & \cdots & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{1}{6} & \frac{1}{6} & \frac{1}{6} & \frac{1}{6} & \frac{1}{6} & \frac{1}{6} & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & 0 & 0 & 0 \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \cdots & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \cdots & 0 & 0 & \cdots & 0 & 0 & \frac{4}{6} & \frac{1}{6} & \frac{1}{6} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \cdots & 0 & 0 & \cdots & 0 & 0 & 0 & \frac{5}{6} & \frac{1}{6} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{pmatrix} \end{array}$$

It should be reduced to a 81 × 81dimension.


9
10
11
12
END
8
7
6
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START
1
2
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4