

Properties of Simple Random Walks on the Integer Axis

Horváth Sándor, David Iclanzan

Department of Mathematics-Informatics, Sapiientia Hungarian University of Transylvania

{shorvath, iclanzan}@ms.sapientia.ro

We consider a simple random walk[1] on \mathbb{Z} , starting from $x \in \mathbb{Z}$, where at each time step a random walker:

- ends the walk with probability r ;
- makes a random move of length one, to left with probability q or to right with probability $p = 1 - q - r$.

We investigate what is the probability distribution for the position of the walker when the walk ends, first by simulating the associated discrete Markov chains, then deriving the closed form formula from a recursively defined sequence.

References

- [1] Grimmett, G., Grimmett, G.R. and Stirzaker, D., *Probability and random processes*, Oxford University Press, 2001.