Introduction to random walks

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28 November, 2021

Random walks - aren’t they great? Useful for everything from modeling animal movement behavior to predicting stock markets. Well, at least for providing a null model.

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Keywords: random; walks

# 1 Introduction

The random walk is a useful statistical tool. Here we show how to simulate, plot, and fit random walks.

# 2 Methods

## 2.1 Simulation

We simulate a Gaussian random walk by taking the cumulative sum of random normal numbers.

## 2.2 Visualization

Random walks are best visualized as a line plot.

## 2.3 Fitting

Given a sequence of positions, the step lengths of the sequence is the difference between positions. The parameters of the Gaussian random walk ( and ) are the mean and standard deviation of the step lengths, respectively.

# 3 Results

Figure 3.1 shows a simulated random walk with = 0.1 and = 2 over 100 time steps.

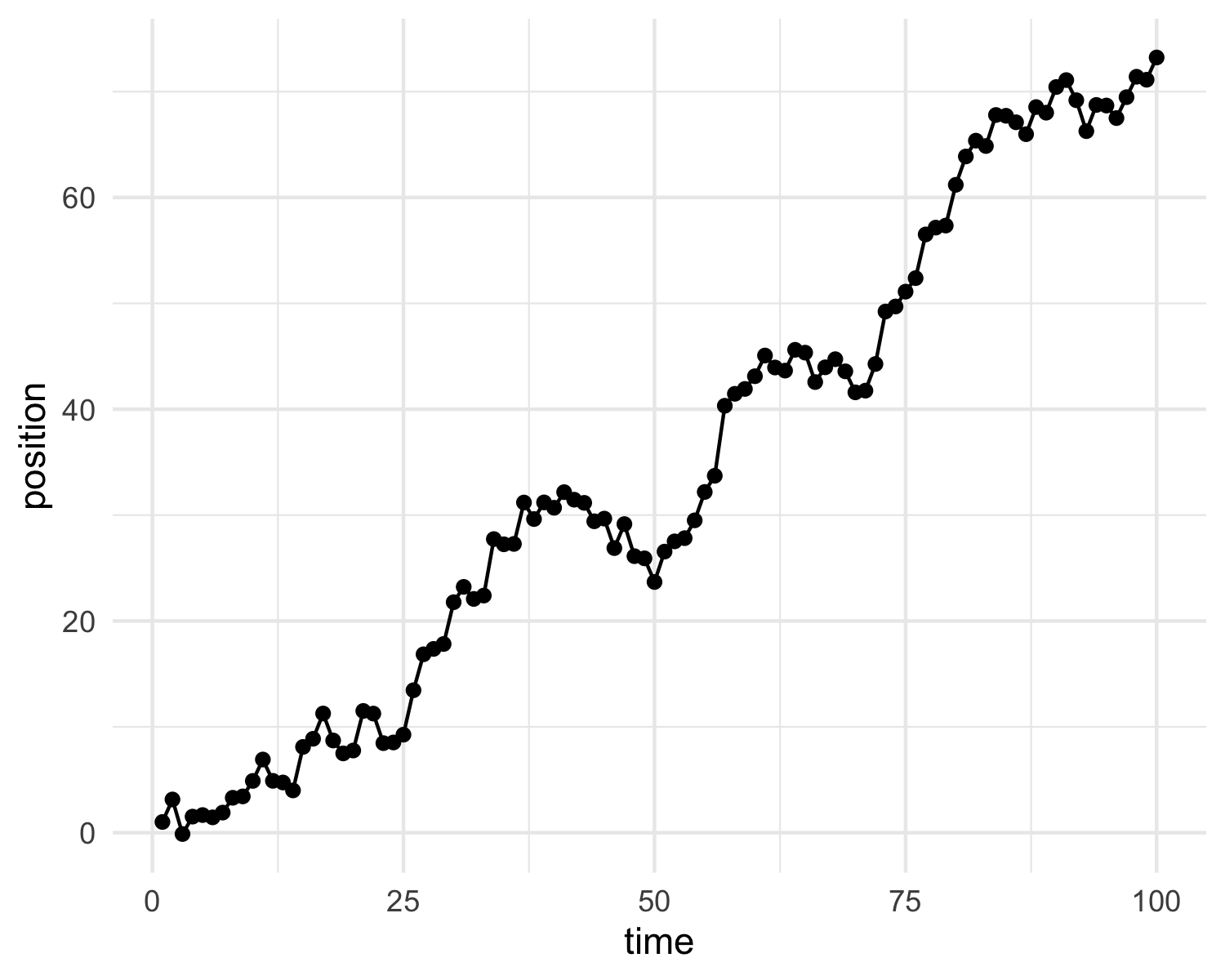


Figure 3.1: A random walk

The fitted walk estimated parameters of = 0.7294085 and = 1.9882632.

# 4 Conclusion

Gee aren’t random walks swell.

### 4.0.1 Colophon

This report was generated on 2021-11-28 10:53:58 using the following computational environment and dependencies:

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