

BF550: Fall 2020

Problem Set 4 is due by 12 pm on Tuesday, October 20

Reading Assignment

Using Python documentation or any other source familiarize yourself with NumPy.

Submission instructions

Follow the same submission instructions as before. Send completed assignments to Howard and cc Kirill. Submit this assignment as a Python notebook that shows the code and the final plots.

Problem 1

Consider a one-dimensional random walker that can move every second. With probability $p_l = 1/3$ it moves to the left, with probability $p_r = 1/3$ it moves to right, and with probability $p_r = 1/3$ it rests and does not move. Assuming at time $t = 0$, the random walker is at $x = 0$, plot the probability density function and the cumulative probability function for $t = 10$, $t = 100$, and $t = 1000$ seconds. Make just two plots; each showing all three time points. Remember that you need to simulate random walks many times to get good statistics. Make the same two plots for $p_l = 0$, $p_r = 1/2$, and $p_r = 1/2$. Do you understand why these plots look different? The plots that you make should be designed well. For example, they should label curves, axes, etc.