STAT 525 Homework 4
Spring 2020 Feb 13

Homework 4

Due in class on Thursday, Feb 20.

1. Implement the one-step-look-ahead method to generate self-avoiding walks with length $d = 11$ (assume the staring point is $x_0 = (0, 0)$). Estimate the mean squared extension $E||x_d - x_0||^2$ of self-avoiding walks with length 11 based on 2000 samples. Give your estimate and the standard error of your estimate. Attached your code and results.

2. Use the one-step-look-ahead algorithm in Problem 1 to estimate the number of self-avoiding walks with length 11 based on 2000 samples. Give your estimate and the standard error of your estimate. Attach your code and result.

3. Suppose we want to sample 3×3 contingency tables with row sums 9, 7, 4 and column sums 13, 5, 2. Suppose we sample the table column by column and use the uniform proposal distribution on each cell as we discussed in class. Compute the probability of generating the following table from the proposal distribution (no simulation is needed):

6	2	1	9
5	2	0	7
2	1	1	4
13	5	2	