MTH 371: Assignment II

November 8, 2018

Instructions

- Use statistical software R for your codes and only basic in built functions are allowed.

- Due date is November 19, 2018 (6 p.m.). No late assignments will be accepted.

- Submit all of your work which include the codes, results and graphs.

- Follow the same labelling method for your files as told in the last assignment.

1. Simulate a Gaussian process with zero mean and following covariance structures with $T = [0, 1]$. (10 points)

   (a) $K(s, t) = e^{-16(s-t)^2}$

   (b) $K(s, t) = min(s, t)$

2. Suppose that A and B each start with a stake of 10, and bet 1 on consecutive coin flips. The game ends when either one of the players has all the money. Let S_n be the fortune of player A at time n. Then $\{S_n, n \geq 0\}$ is a symmetric random walk with absorbing barriers at 0 and 20. Simulate a realization of the process $\{S_n, n \geq 0\}$ and plot S_n vs the time index from time 0 until a barrier is reached. (10 points)