Homework 4

April 2019

1 Brownian Bridge

Recall that a Brownian Bridge $W'(t)$ is a stochastic process whose probability distribution is that of a Wiener process, conditioned on its final value $W'(T) = b$. Simulate and plot 10000 Brownian bridge paths, without using built-in functions (i.e. BrownianBridgeProcess or any Brownian motion functions). In order to receive full credit, you must

a.) Simulate the Brownian Bridge by first simulating a Brownian motion, then subtracting the line $(0, 0)$ to $(T, W(T))$ from it.

b.) Simulate the Brownian Bridge as a scaled stochastic integral, i.e. via the following equation:

$Y(t) = (T - t) \int_0^t \frac{1}{T-u} dW(u), 0 \leq t < T$