

11th exercises for SIM'2018

Ex. 1

Again, re-do the example with the independent Metropolis-Hastings and Fisher's z -distribution (Eq. (9.3)) in the lecture material, page 9-7. Use Cauchy distribution as the proposal distribution with $g(x; 0, 1/2)$. Plot the behavior of the estimate for the mean of Fisher's z -distribution against the length of the MCMC chain.

Ex. 2

'Show' numerically that the posterior distribution is Gamma when the data follows exponential distribution and the prior distribution for the intensity parameter λ in exponential distribution is Gamma($a, a/b$) (see Ex. 7.1).

The exponential data is $\mathbf{x} = (0.254, 0.360, 0.0372, 0.340, 0.252, 0.105, 0.111, 0.222, 0.162, 0.0307)$ and the hyperparameters are $a = 3, b = 3$. 'Show' the posterior using random walk Metropolis-Hastings, and plotting the histogram of the chain.