

EEB 581, Problem Set 11

Recall the joint density given in Example 4 of the MCMC notes,

$$p(x, y) = \frac{n!}{(n-x)!x!} y^{x+\alpha-1} (1-y)^{n-x+\beta-1}$$

where we will take $\alpha = 1$, $\beta = 2$, and $n = 10$.

For this distribution, construct a Gibbs sampler (Example 4 gives the marginal distributions). After burning in the sampler for 100 iterations, generate a vector of 5000 draws of (x, y) pairs from this distribution. From this sampler estimate $E(x)$, $E(y)$, $\sigma^2(x)$, $\sigma^2(y)$ and $\sigma(x, y)$.

You might want to look over the **R** notes on Metropolis-Hastings sampler.