MTH210: Lab 4

Accept-Reject Continued

(New code that you write for this assignment can be saved in new `*.R` files and pushed back to the repository.)

1. Implement an AR algorithm to sample from a Beta$(2, .1)$ distribution. Follow the theory from the notes.

2. Using only $U(0, 1)$ draws, draw samples from Gamma$(4, 3)$ using Accept-Reject and an exponential proposal. Compare the performance of the sampler using the optimal exponential proposal, versus $\lambda = 2$.

3. For a $N(0, 1)$ target, consider a Cauchy proposal with scale parameter σ, where the pdf of such a proposal is

$$g(x) = \frac{1}{\pi\sigma} \frac{1}{(1 + x/\sigma)^2} .$$

   Find the optimal value of σ, and implement the AR algorithm for this value.