Week 5 Problems

1. Load the `turnout` dataset from the `Zelig` library. Implement a Bayesian logistic regression of `vote` on `age` and `income` using a random walk Metropolis-Hasting algorithm with a diffuse multivariate Normal prior. Visually check for convergence.

   - First, use a multivariate Normal jumping distribution to draw all the parameters at the same time. Keep track of your acceptance rate. Note any problems that you encountered.

   - Next, draw each β separately with a univariate Normal jumping distribution given your draws of the other βs. That is, draw in the following order:

      1. $\beta_0^{(t)}|\beta_1^{(t-1)}, \beta_2^{(t-1)}$
      2. $\beta_1^{(t)}|\beta_0^{(t)}, \beta_2^{(t-1)}$
      3. $\beta_2^{(t)}|\beta_0^{(t)}, \beta_1^{(t)}$

      You may tune your individual jumping distributions differently (by setting different variances) to better control acceptance rates.

   Compare your results to the MLE. You may also check your results using `MCMClogit()` in `MCMCpack`.