

Stat 532
In class final
12/12/2016

Name: _____

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1. (8 points) Sketch out the Metropolis-Hastings algorithm including the acceptance rate.
 2. (7 points) Sketch out the algorithm for a Gibbs Sampler.

3. Assume you are asked to fit a Poisson regression model for y as a function of x_1, x_2 , and the intercept.

(a) (5 points) Write out the model, including link functions and all necessary priors.

(b) (3 points) Assume you plan to fit the model using a Metropolis-Hastings algorithm, explain your choice of the proposal distribution.

(c) (3 points) How will you make inferences about the parameters in the model?

(d) (3 points) How will you make predictions for a future set of $X^* = [x_1, x_2]$.

For questions 4-9 choose five of the six questions to answer.

4. (4 points) Why is a Jeffrey's prior useful and how is it calculated?
5. (4 points) Describe your personal philosophy for choosing priors.
6. (4 points) Given a dataset, how do you verify that your assumed model and prior are reasonable?

7. (4 points) Describe the similarities and differences between Bayesian regression and ridge regression.
8. (4 points) Why do we track the acceptance rate in a Metropolis-Hastings algorithm and how does it relate to effective mixing for posterior samples?
9. (4 points) Summarize a paper a classmate presented (not your own work).