
Please prepare your solutions using L^AT_EX or another word processing software.

1. (10 points) Under Zellner's g-prior $\Sigma_0 = \sigma^2(X^T X)^{-1}$, with $\tilde{\beta}_0 = \tilde{0}$, state your prior for σ^2 and derive the marginal distribution $p(\sigma^2|\tilde{y}, X)$.
2. (10 points) Describe the process for choosing priors in Bayesian hypothesis testing with Bayes Factors.
3. Download the King County housing dataset from D2L. You have free rein to use this question to apply some of the ideas we have learned in class. The goal is to create a predictive model that best captures the housing dynamics in King County. Note, there is a dataset called predictHouse, that contains all of the covariates, but will require a predicted price. This will be part of the homework submission and all of the entries will be compared. Note you will only be asked to provide a point estimate, but I could as for a posterior predictive distribution for each home.
 - (a) (10 points) What factors in the dataset do you anticipate being useful predictors of housing price?
 - (b) (10 points) What challenges did you face in understanding or processing the data?
 - (c) (15 points) Concisely write/describe your model, this should include priors. Note: this may include variable transformation, the use of non-normal distributions, spatial structure,...
 - (d) (15 points) Describe the model selection/model averaging process that you employed to come up with a predictive model.
 - (e) (10 points) Summarize the variables in your posterior predictive distribution.
 - (f) (10 points) What variables ended up being important and what did you learn with this assignment.
 - (g) (10 points) What do you anticipate the MSE of your predictions will be?