STA 721 HW 10

1. With the model from class and sufficient statistics, derive the full conditional distributions for α, γ κ_j and ϕ assuming

$$p(\alpha, \phi) \propto 1/\phi \tag{1}$$

$$\gamma_j \mid \kappa_j, \phi, \alpha \overset{\text{iid}}{\sim} \mathsf{N}(0, \frac{1}{\phi\kappa_j}) \tag{2}$$

$$\kappa_j i.i.d. G(1/2, 1/2) \tag{3}$$

   (You should have a name, and expressions for all hyperparameters)

2. Modify you Gamma prior on κ_i to capture the desired features based on l_i.

3. Find the updated full conditionals based on your choice above. Do you need to update all of the full conditionals? Explain.

4. Implement your models in R or JAGS (see earlier JAGS code as a starting point) and apply this to the `longley` data. How do your results compare to classical ridge? Include plots of the posterior distributions of coefficients, plus means and credible intervals, as well as plots of the distributions of the κ's. How sensitive to the results to the prior assumptions? How do the estimates of κ_i compare to the best GCV estimate from class?

5. Explain the compuational advantage of using the canonical parameterization in MCMC.