Module 7 (Bayesian) Exercise

Preliminaries

- Install RTools from here:
- Install and initialize the packages rstan, rstanarm, and shinystan.
  - Be sure to initialize any other packages you would normally use.
- In a new or existing RStudio Project, create an RMarkdown document.

Analysis of Well Switching

- Check out the descriptions of the datasets included with the rstanarm package here:
- Using the **wells** dataset, perform a Bayesian linear regression that uses arsenic level, distance from well, and years of education to predict well-switching.
- View the summary of the regression output.
- Create a histogram of the posterior distribution of the *dist* variable
- Use the leave-one-out method of measuring out-of-sample predictivenes to compute the expected log predictive density.

Analysis of doctors visits

- If necessary, install the package "Ecdat" and initialize it.
- Using the dataset **Doctor**, perform a Bayesian Poisson regression that estimates the number of doctor visits as a function of health care access and health status.
- Once again view the summary of the output but this time view a graphical plot of the credible intervals for *access*.
- Use the Watanabe-Aikake information criterion to view the predictiveness of the Poisson model.