HW #1

Bayesian Psychometric Models Fall 2022

Due Thursday, September 8 at 11:59pm via ICON

This homework is foundational in that it will get you to set up your local machine and access the campus Argon server for conducting Bayesian analyses

## 1. Install stan (5 points)

Using the guides at https://mc-stan.org, install the following programs/packages:

1. rstan (stan and the rstan R package); see https://mc-stan.org/users/interfaces/rstan.html
2. cmdstan r; see https://mc-stan.org/cmdstanr/

Once complete, please run the put the following syntax into an R file and run it on your local machine:

# we recommend running this is a fresh R session or restarting your current session  
install.packages("cmdstanr", repos = c("https://mc-stan.org/r-packages/", getOption("repos")))  
  
library(cmdstanr)  
check\_cmdstan\_toolchain(fix = TRUE, quiet = TRUE)  
library(posterior)  
library(bayesplot)  
color\_scheme\_set("brightblue")  
  
check\_cmdstan\_toolchain()  
install\_cmdstan(cores = 2)  
set\_cmdstan\_path()  
cmdstan\_version()  
cmdstan\_path()  
  
file <- file.path(cmdstan\_path(), "examples", "bernoulli", "bernoulli.stan")  
mod <- cmdstan\_model(file)  
mod$print()  
  
# names correspond to the data block in the Stan program  
data\_list <- list(N = 10, y = c(0,1,0,0,0,0,0,0,0,1))  
  
fit <- mod$sample(  
 data = data\_list,   
 seed = 123,   
 chains = 4,   
 parallel\_chains = 4,  
 refresh = 500 # print update every 500 iters  
)  
  
fit$summary()  
mcmc\_hist(fit$draws("theta"))

Please take a screen shot and upload that as part of your homework results.

## 2. Connect to Argon (5 points)

If you have a windows machine, install an SSH client (try putty: https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html). Mac and Linux users have these clients built in.

For windows users, please start putty when the instructions below say to open a terminal window.

1. Open a terminal window (in MacOS you can find this using Spotlight search—command+space)
2. Connect to argon using the command: ssh [hawkID]@argon.hpc.uiowa.edu (replace [hawkID] with your hawkID)
3. Once you get past the two-factor authentication, please take a screen shot of the prompt in the terminal window and upload that as part of your homework results