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:

```r
# 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