HW #1

Bayesian Psychometric Models Fall 2024

Invalid Date

This homework is foundational in nature in that it will get you to set up your local machine and access the campus IDAS 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 IDAS (5 points)

The University of Iowa Interactive Data Analytics Service (sometimes called IDAS Notebooks) is a place where you can access RStudio and our course materials online. The IDAS Notebooks server can run stan and JAGS, which makes it useful for running Bayesian analyses.

This question ensures you have access. To complete this question, please do the following:

1. Go to <https://notebooks.hpc.uiowa.edu> and find our course site
2. Log in using your HawkID and password
3. Once you get past the two-factor authentication, install the following:

* rstan (stan and the rstan R package); see <https://mc-stan.org/users/interfaces/rstan.html>
* 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)  
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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)  
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# names correspond to the data block in the Stan program  
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fit <- mod$sample(  
 data = data\_list,   
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 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.