MTH225-8 In-class exercise 1: Covariance analysis

Names: (signatures only please, printed names will not be counted)

1.) 4.)

2.) 5.)

3.) 6.)

Overview

Modify the file `week8_IC1_covariance_example.Rnw` to use the column `C.H` (city or highway) of the `epa` data frame instead of `car.truck` (car or truck)

Our predictors will be:

- vehicle weight in units of 1,000 pounds
- the `C.H` variable (converted to 0 or 1 for STAN)

Start with the Rstudio and STAN model files `week8_IC1_covariance_example.Rnw` and `week8_IC1_covariance_example.stan`.

Instructions for modifying the Rstudio (.Rnw) file

Starting with the .Rnw file from the example,

- Save a copy of `week8_IC1_covariance_example.Rnw` with the name `week8_IC1_example.Rnw`
- Save a copy of the `week8_IC1_covariance_example.stan` with the name `week8_IC1.stan`
- Replace the code for the car or truck variable `car.truck` with code to use the variable `C.H` (which takes values 'C' and 'H')
- Modify the parameter names in the stan file to be `city` and `highway`.

Instructions for modifying the STAN model (.stan) file

starting with `week8_IC1_covariance_example.stan`,

data block

- Change the variable names to match the new variable names in the .Rnw file.

parameters block

- Replace the parameters `car` and `truck` with `city` and `highway`.

model block

- Change the variable names the same way as in the parameters block.

generated quantities

- Add a generated quantities block at the end of the STAN file.
- Define a `real` variable called `diff`.
- Assign the value `highway-city` to `diff`

Analyzing the output

After you run the program, use the output to answer the following questions:

Does the 95% credible interval for `diff` include zero?

How would you interpret the value of the parameter beta?