

## MTH225 Fall2016 Final Problem 8

A pair of wire loops embedded in a highway surface record the speed of vehicles passing over them (in miles per hour). Use the sample to produce a 95% confidence interval for the standard deviation of the speeds.

The data is in `MTH225_Fall2016_Final_Problem8.csv`. The variables are:

- `mph` Speed in miles per hour.

Use STAN to model the data as a sample from a normal population, and use the posterior draw to produce a 95% confidence interval for the standard deviation.

- 2 points: Write R code to read the data and convert it to an R data frame.
- 1 point: Write the data block of a STAN model file that extracts the data from the R workspace.
- 1 point: Write the parameters block of a STAN model file that declares the parameter(s) of your model.
- 2 points: Write the model block of a STAN model file that specifies the priors and likelihood for your model.
- 1 point: Write R code to apply the `extract` function to the data structure output from the `stan` function.
- 1 point: Use the `extract()` function of the RSTAN package to obtain the values for the parameters from the posterior draw.
- 1 point: Use the posterior draws to obtain a point estimate for the standard deviation parameter.
- 1 point: Use the posterior draw to construct a 95% confidence interval for the standard deviation parameter.

(10 points possible)