# MTH225 Spring2017 Final Problem 10

In this problem, we will model the speed of pitches in the 2016 world series collected with the pitchFx system as a single factor anova, with one level for each type of pitch. The types of pitches recorded are:

- FF Four seam fastball
- FC Cut fastball
- FT Two seam fastball
- SI Sinker
- SL Slider
- CU Curveball
- CH Changeup

The data is in `MTH225_Spring2017_Final_Problem10.csv`. The variables are:

- `pt` An R factor giving the type of pitch.
- `start_speed` Starting speed of the pitch.
- `ptn` Numeric code 1-7 indicating the type of pitch.

Use STAN to model the data using a single-factor ANOVA with seven levels.

- 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 paramter(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: Compute 95% confidence intervals for the mean starting speed of each type of pitch.

- 1 point: Use the posterior draw for this year's mean to estimate the probability that each type of pitch exceeds 89 mph.

(10 points possible)