In the heart of the roaring arenas and under the watchful eyes of thousands, the world of professional bull riding (PBR) unfolds, where grit, skill, and a dash of luck intertwine. We will be building models to investigate how points are achieved by riders, we will dive into the data from the 2023 season of the Touring Pro Division.

1. Fit a model predicting riders Points using all variables minus rider name, what can we notice about the output? Why is this happening? \*Hint: check dataset documentation\*

2. Using the rider’s dataset, predict the points of a rider using avg. time for rider to fall off (`Avg Buckoff Time`), number of rides (Rides), and percent rides ridden (prop. Ridden) as predictors.

A. Fit the model. Assess residual plots. What do we see?

B. Test the significance of the model.

C. Now add an interaction between `Avg Buckoff Time` and Rides. Record R-code formula here.

D. Test whether having the interaction in the model is significant or not.

3. Using ggplot we will be constructing plots to assess the predictors

A. Make a plot so Points ~ Avg Buckoff Time and Rides ~ prop.Ridden. What do we notice?

B. Based off the outcomes and trends of the plots, what might we consider add to or model from the previous question?

C. Now, using the model from question 2, add a quadratic term for Avg Buckoff Time. Record the R-code formula here. Record R-code here.

D. Test which model, original or transformed, is more effective for the data?