

# MAT453 - ASSIGNMENT 8

Spring 2025

Assignment Due (by 11:59 P.M.): Sunday, March 30

**Directions:** You may discuss the exercises with other students and with the instructor, but the work you turn in must be your own. You will need to submit your R code and answers to the questions below in **one** word or pdf file.

**Exercises:** (10 points total) We explore linear mixed model in this assignment. Run the R command below to obtain the dataset:

```
exer <- read.csv("https://stats.idre.ucla.edu/stat/data/exer.csv")
## Convert variables to factor
exer <- within(exer, {
  diet <- factor(diet)
  exertype <- factor(exertype)
  time <- factor(time)
  id <- factor(id)
})
```

Then:

1. Plot a line or scatter plot of time (in x-axis) vs. pulse (in y-axis), with different colors/linetypes representing different diet type. What can you conclude?
2. Plot a line or scatter plot of time (in x-axis) vs. pulse (in y-axis), with different colors/linetypes representing different exertype. What can you conclude?
3. Fit a linear regression model (i.e., *lm*) to predict pulse from diet and exertype.
4. Fit a linear mixed model (i.e., *lmer* from package *lme4*) to use diet and exertype as fixed effects and a random intercept for each id. Compare the coefficients of the two models.