STAT 213, SUMMER 2021: SPECIFIC LEARNING OBJECTIVES

The following is a list of all the Concepts and Content SLOs in this course. Items in *italics* are expected to be at least somewhat familiar from a prerequisite course.

A. Linear Regression Models

1. *Write down the prediction equation for simple linear regression model with a quantitative predictor and interpret its coefficients*
2. Write down the prediction equation for a multiple regression model using indicator variables and interpret their coefficients.
3. Write down the prediction equation for a multiple regression model using interaction terms and interpret their coefficients.

B. Linear Model Assessment

1. *Sensibly diagnose violations of regression conditions using residual plots, and suggest potential remedies*
2. Identify and distinguish outliers and high leverage cases using appropriate tools
3. Explain what multicollinearity is and why it can be a problem for inference

C. Inference and Prediction

1. *Accurately state what is being tested by test and intervals for individual coefficients in linear regression models*
2. *Interpret confidence and prediction intervals for response variables in linear regression models*
3. Distinguish "total value" from "added value" of a set of predictors

D. Comparison and Selection of Models

1. Identify what models to compare to answer a targeted question
2. Explain the concept of overfitting, why it is a problem when doing model comparison, and ways it can be addressed
3. Sensibly employ (cross-)validation as a model validation/selection tool

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E. Logistic Regression

1. Reason about and distinguish probabilities, odds, and log odds
2. Interpret coefficients in terms of odds ratios
3. Write model prediction equations in probability and/or logit form

F. Analysis of Variance

1. *Identify hypotheses and interpret results for omnibus F tests*
2. Explain the concept of familywise error rate (FWER) and the strengths and weaknesses of various methods for controlling it
3. Translate between ANOVA models and equivalent linear regression models
4. Translate between group means and model coefficients
5. Reason about the relationships among elements of ANOVA tables