Spring 2024

WEEK 14 STUDY GUIDE

The Big Picture

We conclude the term with conditioning in the multivariate normal model, and inference in the standard multiple regression model.

- The regression line can be written in multiple forms, one of which extends to the case of multiple regression.
- Prediction based on multiple predictors has familiar properties: There is a general formula for the best linear predictor, which is a natural extension of the formula for simple regression; and if the underlying distribution is multivariate normal then the best linear predictor is also the best among all predictors.
- The multiple regression model with normal errors is fundamentally important in data science. Properties of the estimated parameters lead to straightforward methods of inference.

Week At a Glance

Mon 4/22	Tue 4/23	Wed 4/24	Thu 4/25	Fri 4/26
	Lecture	Section	Lecture	Mega Section
HW 13 Due HW 14 (Due Mon 4/29)				HW 14 party 2 PM to 5 PM
Focus on understanding HW 13	Work through Chapter 24	Skim Section 25.4; work on HW 14	Work through Section 25.4	Work on HW 14

Reading, Practice, and Class Meetings

Book	Topic	Lectures: Prof. A.	Sections: TAs	Optional Additional Practice
Ch 24, 25	**Towards Multiple Regression** - 24.4 writes the regression equation in multiple different ways, each one illuminating a different property and making it easier to understand the corresponding formulas in multiple regression - 25.1, 25.2, 25.3 extend the corresponding simple regression sections (24.1, 24.3, 24.4) to the multivariate case; we will just talk through these and not do the details - 25.4 introduces the multiple regression model most commonly used in data science	Tuesday 4/23 - MSE in simple regression; connection with the bivariate normal - The big picture of the multivariate case - The multiple linear regression model: understanding the assumptions	Wednesday 4/24 - Ch 24 Ex 1, 3, 6	None; focus on the homework
	Multiple Linear Regression - 25.4 continued: the estimates and their distribution under the model	Thursday 4/25 - Multiple linear regression model: parameter estimation and inference	Friday 4/26 - Ch 24 Ex 7 - Multiple regression multiple choice	