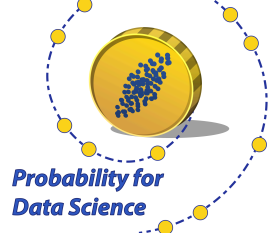


DATA 140



Spring 2025

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 4/28	Tue 4/29	Wed 4/30	Thu 5/1	Fri 5/2
	Lecture	Section	Lecture	Mega Section
			Regular OH 9 AM to 12 noon	
HW 13 Due HW 14 (Due Mon 5/5)				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: Michael	Sections: TAs	Optional Additional Practice
Ch 24, 25	<p>Towards Multiple Regression</p> <ul style="list-style-type: none"> - 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 	<p>Tuesday 4/29</p> <ul style="list-style-type: none"> - MSE in simple regression; connection with the bivariate normal - The big picture of the multivariate case - The multiple linear regression model: understanding the assumptions 	<p>Wednesday 4/30</p> <ul style="list-style-type: none"> - Ch 24 Ex 1, 3, 6 	None; focus on the homework
	<p>Multiple Linear Regression</p> <ul style="list-style-type: none"> - 25.4 continued: the estimates and their distribution under the model 	<p>Thursday 5/1</p> <ul style="list-style-type: none"> - Multiple linear regression model: parameter estimation and inference 	<p>Friday 5/2</p> <ul style="list-style-type: none"> - Ch 24 Ex 7 - Multiple regression multiple choice - Ch 23 Ex 5 	