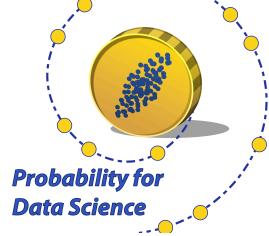


# DATA 140



Fall 2024

## WEEK 15 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 12/2	Tue 12/3	Wed 12/4	Thu 12/5	Fri 12/6
	Lecture	Section	Lecture	Mega Section
<b>HW 14 Due at 5PM</b> HW 15 (Due 5PM Mon 12/9)				HW 15 party 2 PM to 5 PM
Focus on understanding HW 14	Work through Chapter 24	Skim Section 25.4; work on HW 15	Work through Section 25.4	Work on HW 15

## Reading, Practice, and Class Meetings

Book	Topic	Lectures: Prof. A.	Sections: TAs	Optional Additional Practice
Ch 24, 25	<p><b>Towards Multiple Regression</b></p> <ul style="list-style-type: none"> <li>- 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</li> <li>- 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</li> <li>- 25.4 introduces the multiple regression model most commonly used in data science</li> </ul>	<p>Tuesday 12/3</p> <ul style="list-style-type: none"> <li>- MSE in simple regression; connection with the bivariate normal</li> <li>- The big picture of the multivariate case</li> <li>- The multiple linear regression model: understanding the assumptions</li> </ul>	<p>Wednesday 12/4</p> <ul style="list-style-type: none"> <li>- Ch 24 Ex 2, 3, 4</li> </ul>	None; focus on the homework
	<p><b>Multiple Linear Regression</b></p> <ul style="list-style-type: none"> <li>- 25.4 continued: the estimates and their distribution under the model</li> </ul>	<p>Thursday 12/5</p> <ul style="list-style-type: none"> <li>- Multiple linear regression model: parameter estimation and inference</li> </ul>	<p>Friday 12/6</p> <ul style="list-style-type: none"> <li>- Ch 24 Ex 6, 7</li> <li>- Multiple regression model True/False</li> </ul>	