

PROB 140

Fall 2020



WEEK 14 STUDY GUIDE

The Big Picture

Simple linear regression predicts Y as a linear function of a single X . No matter what the joint distribution of X and Y , there is always a least squares line. If X and Y are bivariate normal, this line turns out to be the best among all predictors.

- A straightforward least-squares calculation results in the Data 8 formula for the equation of the regression line.
- Standard bivariate normal X and Y can be constructed so that Y is the sum of a linear function of X and independent normal noise.
- For the bivariate normal, the conditional expectation is a linear function of the given variable, and hence is the same as the best linear predictor.
- The regression line can be written in multiple forms, one of which extends to the case of multiple regression.

Week At a Glance

Mon 11/23	Tue 11/24	Wed 11/25	Thu 11/26	Fri 11/27
	Instructor's Session			
HW 11 Party 6-7PM HW 11 Due				
Lab 7 Due				
Skim Sections 24.1-24.2	Read Chapter 24			

Note: There are no assignments this week, but we expect that you will return after the break with the material of Chapters 23 and 24 in your head. Please read/review these two chapters next Monday at the latest.

Reading, Practice, and Live Sessions

Sections	Topic	Live Sessions: Prof. A.	Live Sessions: GSIs	Recommended Practice
Ch 24	Simple Regression <ul style="list-style-type: none"> - 24.1 derives the equation of the regression line - 24.2 constructs bivariate normal random variables so that the relation between can be expressed in terms of “linear signal plus noise” - 24.3 looks at least-squares prediction in the context of the bivariate normal, and the connection with linear regression - 23.4 writes the regression equation in multiple different ways, each one illuminating a different property 	<p>Tuesday 11/24</p> <ul style="list-style-type: none"> - Simple regression: general case - Bivariate normal - Regression and the bivariate normal <p>No checkpoint</p> <p>Thursday 11/26</p> <p>Happy Thanksgiving!</p>	No sections	Take a break from exercises, but read Ch 24 carefully.