

PROB 140 Fall 2020
WEEK 12 STUDY GUIDE



The Big Picture

The least squares predictor of one variable given another, and the error in it

- If you have the scatter diagram of simulated (X,Y) pairs, then Data 8 ideas say that given X , the best predictor of Y is the “center of the vertical strip at X .”
- Formally, “best” means “least squares,” and the “center of the vertical strip at X ” is the conditional expectation of Y given X .
- The error in this estimate, given X , is the conditional SD of Y given X .
- This allows us to decompose the variance of Y into two easier pieces, by conditioning on X .

Week At a Glance

Mon 11/9	Tue 11/10	Wed 11/11	Thu 11/12	Fri 11/13
	Instructor's Session		Instructor's Session	
				GSI's Sessions
No Checkpoint this week				
HW 9 Party 6-7PM HW 9 Due HW 10 (Due Mon 11/16)				HW 10 Party 6-7PM
Lab 6A Due Lab 6B (Due Mon 11/16)			Lab 6B Party 6-7PM	
Skim Sections 22.1-22.2	Read Sections 22.1-22.2	Skim Sections 22.3-22.4	Read Sections 22.3-22.4	Work some exercises from Ch 22

Note: Another unusual week – just one chapter to cover, and a mid-week holiday. **Please take the time to do the lab carefully.** It brings together many ideas, and is about one of the most commonly used processes in modeling.

Reading, Practice, and Live Sessions

Sections	Topic	Live Sessions: Prof. A.	Live Sessions: GSIs	Recommended Practice
Ch 22	<p>Approaches to inference</p> <ul style="list-style-type: none"> - 22.1 develops the main reason why conditional expectation is important for prediction - 22.2 shows that conditional expectation is a least squares predictor, and defines the error in the estimate - 22.3 decomposed variance into two pieces, by conditioning - 22.4 is a series of examples of varied uses of the method of 22.3 	<p>Tuesday 11/10</p> <ul style="list-style-type: none"> - The random variable equivalent of “dropping a perpendicular” - Least squares prediction, and a new variance <p>No checkpoint</p> <p>Thursday 11/12</p> <ul style="list-style-type: none"> - Variance by conditioning - Examples, including a look back at Section 9.2 	<p>Wednesday 11/11 Holiday</p> <p>Friday 11/13 - Ch 22 Ex 1, 6, 4</p>	<p>Ch 22 - Ex 2, 3, 5, 7</p>