

PROB 140 Spring 2021

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 4/12	Tue 4/13	Wed 4/14	Thu 4/15	Fri 4/16
	Instructor's Session		Instructor's Session	
		GSIs' Sessions		GSIs' Sessions
No Checkpoint this week				
HW 9 Party 7PM HW 9 Due HW 10 (Due Mon 4/19)				
Lab 6A Due Lab 6B (Due Mon 4/19)				Lab 6B Party 5PM
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

Reading, Practice, and Live Sessions

Sections	Topic	Live Sessions: Prof. A.	Live Sessions: GSIs	Recommended Practice
Ch 22	Approaches to inference <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 4/13</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 4/15</p> <ul style="list-style-type: none"> - Variance by conditioning - Examples, including a look back at Section 9.2 	<p>Wednesday 4/14</p> <ul style="list-style-type: none"> - Ch 20 Ex 3 - Ch 22 Ex 6, 7 <p>Friday 4/16</p> <ul style="list-style-type: none"> - Ch 22 Ex 2, 1, 5 	<p>Ch 22</p> <ul style="list-style-type: none"> - Ex 3, 4