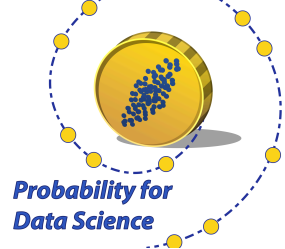


DATA 140



Spring 2024

WEEK 10 STUDY GUIDE

The Big Picture

The normal and gamma families are heavily used in modeling. We study these, along with a generating function that helps understand them better.

- The *moment generating function* (mgf) is more powerful than probability generating functions for dealing with sums. This helps us establish the properties of normal and gamma families that we observed by simulation, and indicates why the CLT is true.
- The mgf and *Chernoff's bound* improves on the tail bounds of Markov and Chebyshev.

Week At a Glance

Mon 3/31	Tue 4/1	Wed 4/2	Thu 4/3	Fri 4/4
	Lecture	Sections converted to general OH	Lecture	Mega Section
Lab 6B Due Lab 7 (Part A due Mon 4/7)			Lab 7A Party 9 AM to 12 Noon	
HW 9 Due HW 10 (due Mon 4/7)				HW 10 Party 2 PM to 5 PM
Prepare for Midterm	Prepare for Midterm	Midterm 2	Work through Chapter 19.1 - 19.3	Work through rest of Chapter 19

Reading, Practice, and Class Meetings

Book	Topic	Lectures: Michael	Sections: TAs	Optional Additional Practice
Ch 19	<p>Moment generating functions The first two sections of Ch 19 parallel the start of Ch 14 on the pgf</p> <ul style="list-style-type: none"> - 19.1 has a formula for the density of a sum, but it's often intractable - 19.2-3 define the mgf and examine its uses 	<p>Tuesday 4/1</p> <ul style="list-style-type: none"> - Convolution formula for the density of a sum - Moment generating functions: definition, main properties 	<p>Wednesday 4/2</p> <ul style="list-style-type: none"> - Sections converted to general OH 	
Ch 19	<p>Moment generating functions 19.3 develops a sort-of proof of the CLT</p> <ul style="list-style-type: none"> - 19.4 uses the mgf to develop a new tail bound 	<p>Thursday 4/3</p> <ul style="list-style-type: none"> - Moment generating functions: CLT; Chernoff's bound 	<p>Friday 4/4</p> <ul style="list-style-type: none"> - Ch 19 Ex 3, 2ac, 7 	<p>Ch 19</p> <ul style="list-style-type: none"> - Ex 1