SticiGui, Onsophic, and Statistics W21

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Statistics W21

- First online course taught at Berkeley, in any subject.
- Primary audience: intended Business & Economics majors.
- Enrollment 300–425, many timezones, including Asia.
- Hybrid 1997–2006; online 2007–present
- Mastery-based: $\leq$ 5 submissions, $\geq$ 80% or no credit.
- In-person final ($\approx$50 students take proctored off-campus).
- Typically 7 GSIs holding $\approx$140 office hours per week.
- "Learning preparedness assessment" by phone $\approx$1 month before class.

Milestones

- Most of text online in 1997, including applets for key concepts, glossary.
- Online, machine-graded assignments from 1998.
- Dynamic examples, exercises, individualized homework from 2000.
- Added topics continually. Now have reasoning, set theory, logic, …
- "Functional grading" from 2003.
- Online office hours with whiteboard, 2-way audio/video, etc. from 2007
- Online lectures from 2009.
- Deep anchors and thorough analytics from 2011.

SticiGui

- 222 XHTML files, 140,384 lines
- 63 Java classes, 15,385 lines
- 28 JavaScript libraries, 15,418 lines
- 4 CSS files, 2,201 lines
- 37 data files, 10,733 records

Close to 8000 hours of work.

Onsophic

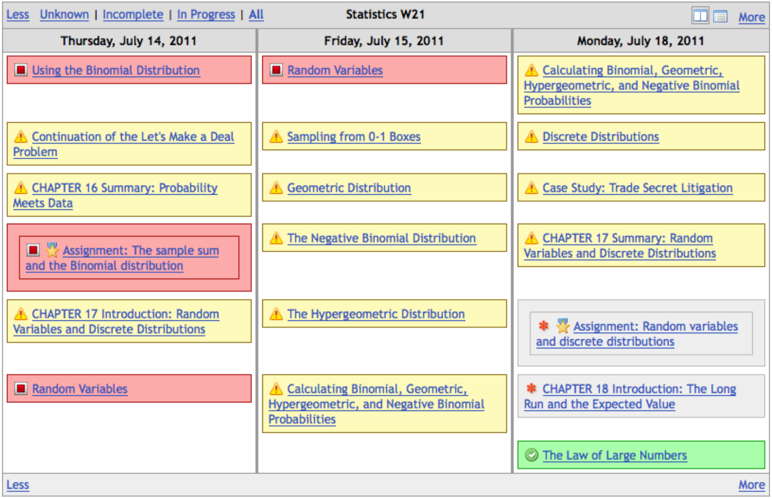
- Platform for discovery of course materials, course assembly, course delivery, analytics.
- Built on Sakai.
- Customization for W21: SMS for office hours, heat map granularity, etc.

Analytics

- Viewing sections of book, lecture, or podcast
- Viewport events
- Viewing footnotes
- Attempting practice problems
- Submitting homework

Number of activities, time on task, scores.

Screenshots: Daily Assignments



Less Unknown | Incomplete | In Progress | All — Statistics W21 — More

Thursday, July 14, 2011	Friday, July 15, 2011	Monday, July 18, 2011
Using the Binomial Distribution	Random Variables	Calculating Binomial, Geometric, Hypergeometric, and Negative Binomial Probabilities
Continuation of the Let's Make a Deal Problem	Sampling from 0-1 Boxes	Discrete Distributions
CHAPTER 16 Summary: Probability Meets Data	Geometric Distribution	Case Study: Trade Secret Litigation
Assignment: The sample sum and the Binomial distribution	The Negative Binomial Distribution	CHAPTER 17 Summary: Random Variables and Discrete Distributions
CHAPTER 17 Introduction: Random Variables and Discrete Distributions	The Hypergeometric Distribution	* Assignment: Random variables and discrete distributions
Random Variables	Calculating Binomial, Geometric, Hypergeometric, and Negative Binomial Probabilities	* CHAPTER 18 Introduction: The Long Run and the Expected Value
		The Law of Large Numbers

Less More

Screenshots: Module Overview

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Sections		Open Date	Close Date
Intro thru Demo			
Read: Sample Data Sets @ SticiGui	= 1		
Read: Trade Secret Data @ SticiGui	= 1		
Watch: Trade Secret Data @ YouTube	= 1		
Listen: Trade Secret Data @ webcast.berkeley	= 1		
Practice			
Practice: Exercise 3.2 @ SticiGui	= 1		
Practice: Exercise 3-3 @ SticiGui	= 1		
Practice: Exercise 3-4 @ SticiGui	= 1		
Practice: Exercise 3-5 @ SticiGui	= 1		
Intro thru Demo			
Read: Gravity Data @ SticiGui	= 1		
Watch: Gravity data @ YouTube	= 1		
Listen: Gravity data @ webcast.berkeley	= 1		

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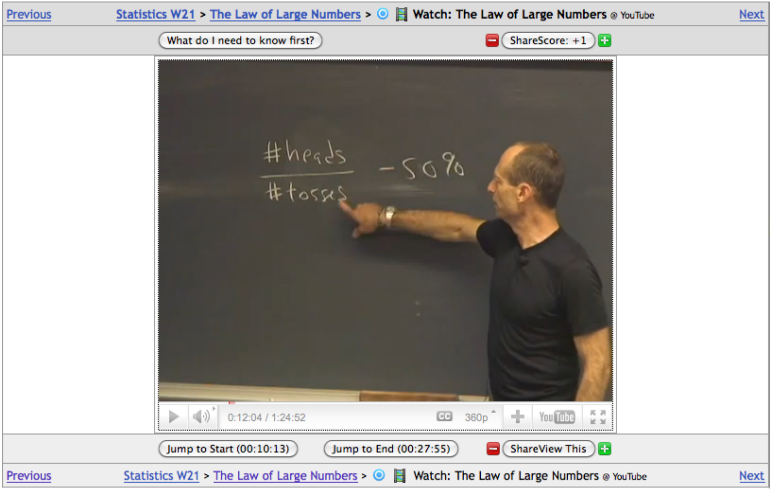
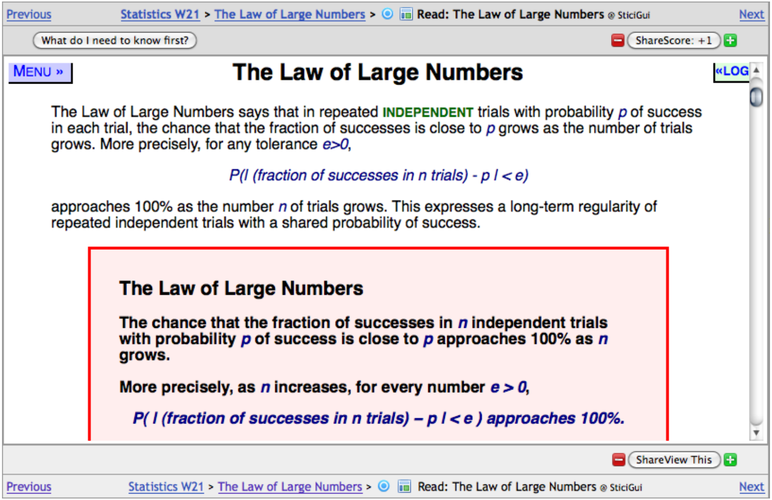
Screenshots: Online Lecture



Screenshots: SticiGui reading


Previous Statistics W21 > The Law of Large Numbers > Read: The Law of Large Numbers © SticiGui Next

What do I need to know first? ShareScore: +1

MENU » «LOG

The Law of Large Numbers

The Law of Large Numbers says that in repeated **INDEPENDENT** trials with probability *p* of success in each trial, the chance that the fraction of successes is close to *p* grows as the number of trials grows. More precisely, for any tolerance *e>0*,

P(| (fraction of successes in n trials) - p | < e)

approaches 100% as the number *n* of trials grows. This expresses a long-term regularity of repeated independent trials with a shared probability of success.

The Law of Large Numbers

The chance that the fraction of successes in *n* independent trials with probability *p* of success is close to *p* approaches 100% as *n* grows.

More precisely, as *n* increases, for every number *e > 0*,

P(| (fraction of successes in n trials) – p | < e) approaches 100%.

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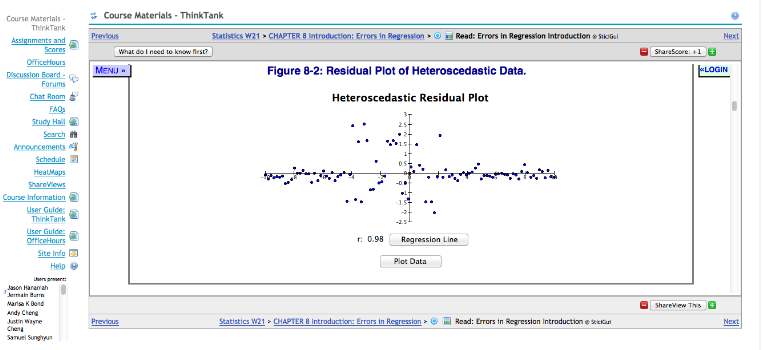
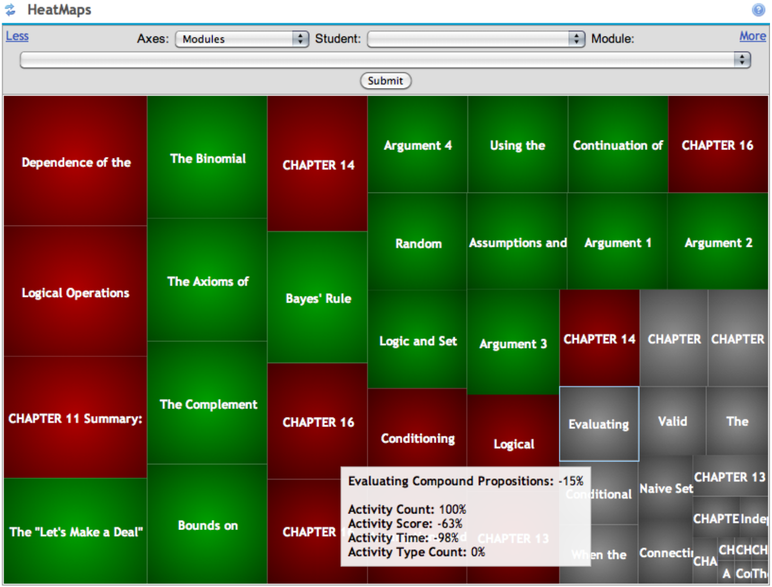
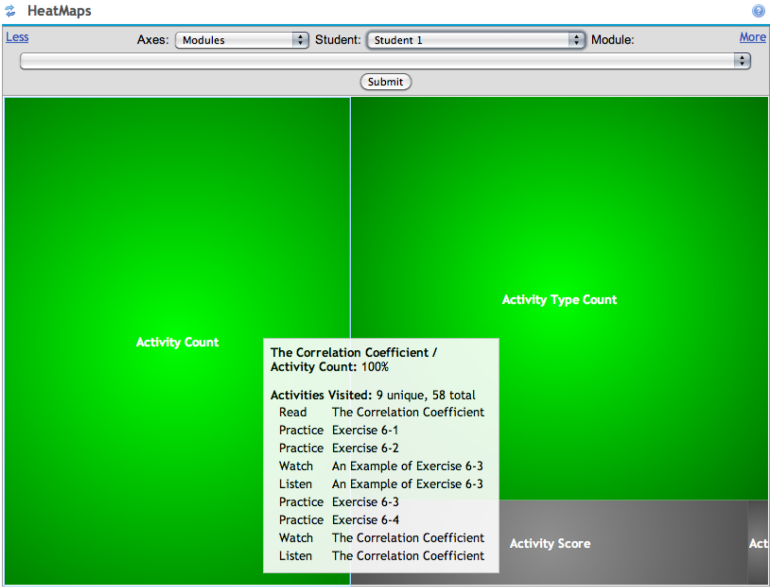
Screenshots: SticiGui reading



Screenshots: HeatMap of Modules

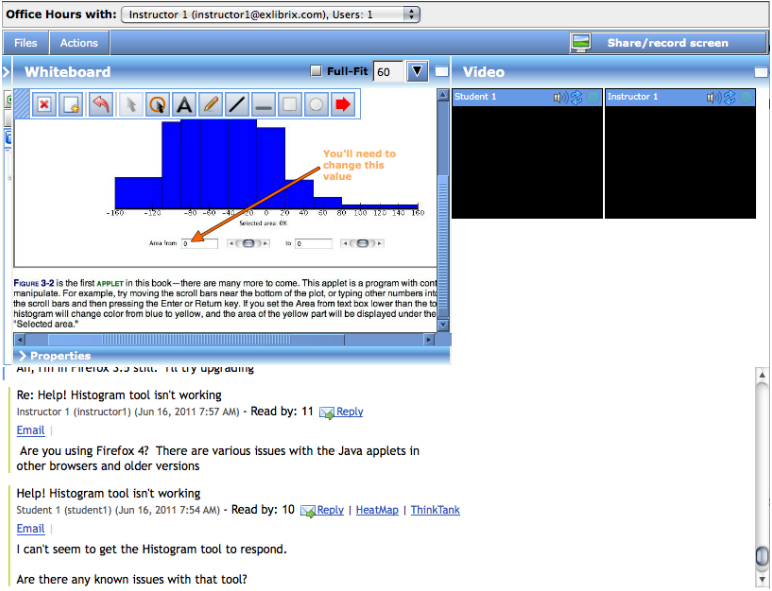


Screenshots: HeatMap for Student Activities



Screenshots: HeatMap for Student 1

Screenshots: Office



Research Questions Analytics Can Answer

- Do students who read footnotes do better than those who don't?
- Do students who do more self-test exercises do better than those who do fewer?
- Do students who spend the majority of their time watching online lectures do better than those who spend the majority of their time reading the book?
- What features of students' use of the materials predict mastery of the material?
- Do interventions to promote such use increase mastery?

Example: Time Versus Assessment Score, Spearman test

- Histograms and data taxonomy: $p \approx 0.8$
- Counting (combinatorics): $p \approx 0.03$