Panel 1

Welcome to Math 1203 - Intro to Stats

for Social Sciences

Bert Wachsmuth

Office: Science Hall 118D

Hours: MW 10-11, by appointment

Email: wachsmut@stmarytx.edu

http: pirate.stmarytx.edu/~wachsmut

1

Panel 2

Syllabus! ✓

MW

1. Install DyKnow
2. Redeem Access code for StatCrunch

2

Panel 3

Course Overview:

1. Overview: Population, Samples, types of vars
2. Sample and Measurement
   Random Sample
3. Descriptive Statistics
   distributions, graphs, measures of central tendency, variability
4. Probability Distributions:
   Central Limit Theorem

3

Panel 4

5. Statistical Inference: Estimation
   confidence intervals, error estimates
6. Statistical Inference: Significance Tests
   About the mean.
8. Associations between Categorical Vars
   E.g. does smoking cause cancer
9. Linear Regression + Correlation
   Predictions, numerically
7. Comparing two Groups optional

4

Panel 5

What is Statistics?

measuring difference between variables

measuring some data to figure out stuff
or %

5

Panel 6

What is Statistics?

Statistics is the science of making sense of data / or:

Statistics consists of a body of methods for obtaining and analyzing data

- collect data — Design Phase
- summarize ⟶ Description Phase:
- analyze it — Inference Phase:
- report

6

Panel 7

Example: Use a small group of numbers to make inferences about large group.

GSS: General Social Survey: each ≈ 2000 adults in the US

questions like: "Do you believe in god"

Suppose 1250 say yes

Design: done - GSS survey data

Description: 1250 out of 2000, or 62.5%, say "yes"

Inference: 62.5% of US adults believes in gods. with margin of error ±2%

7

Panel 8

Population: Set of all measurements in question

Sample: A subset of measurements from the population

Descriptive Statistics: Summarizes the info in a collection of data

Inferential Statistics: Provides predictions about the population based on a sample

8

Panel 9

Parameter: numerical summary of population (often unknown)

Statistics: numerical summary of sample data.

Ex: 1850 (sample) randomly selected US adults (population) were asked "do you believe in heaven"? 1000 answered "yes", 800 "no", and 50 did not answer. We compute, somehow, that 55.5% ± 3% of US adults believe in heaven.

descr. stats

inference

$\frac{1000}{1800} = 55.5\%$ because 50 no-shows must be excluded

9

Panel 10

Ex: 1850 randomly selected US adults were asked "do you believe in heaven"? 1000 answered "yes", 800 "no", and 50 did not answer. We compute, somehow, that 55.5% ± 3% of US adults believe in heaven. Identify:

population	sample
descr. stats	inf stats
statistics	parameter

done

10

Panel 11

Ex: Find avg. exam score in this class

parameter (no inference necessary)

(no sample necessary)

Ex: Tax auditor has 25 000 accounts. How many are in error?

Pick randomly 200 accounts (sample)

check those carefully and compute inferential stats

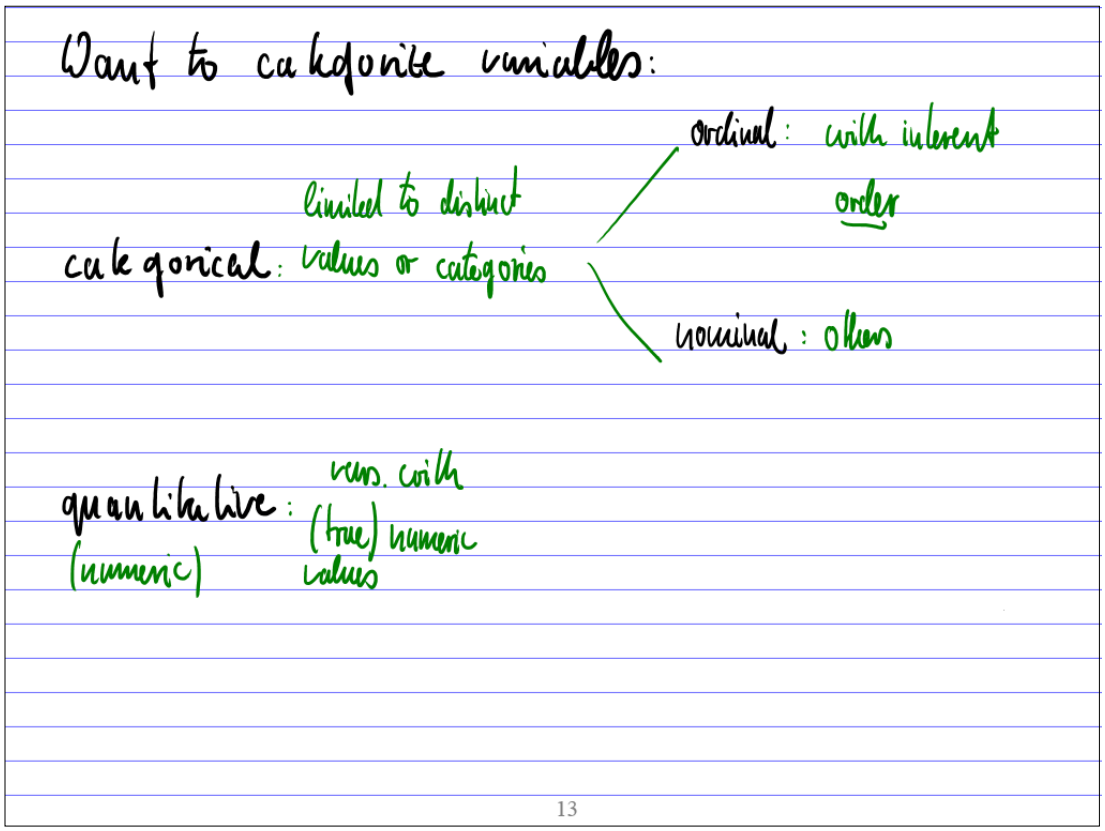
11

Panel 12

Stat Crunch + GSS Data

12

Panel 13



Panel 14