

ECON 1123 Section 1

Slides at github.com/cjleggett/1123-section

Outline

- Introductions
- What to Expect from Section
- How to ECON 1123
- Lecture Recap / Questions
- Examples + Practice

Introductions

About Me

- Senior in Dunster
- Studying CS w/ Econ Secondary
- From New Hampshire
- Like to...
 - Read
 - Listen to music / go to concerts
 - Watch Soccer
 - Watch stupid TV w/ Friends



Name Circle

- Name
- Year
- Concentration
- Favorite HUDS Meal



What to Expect from Section

Section Outline

- Name Circle
- **Short** lecture recap
 - Can be longer with questions—asking questions is the whole reason we have section!
- **Lots** of exercises
 - You should ask questions here too!

Programming Languages

- Stata, R, and Python are all options for doing psets
- I did the psets last year in R, and I'm doing them this year in Python
- I may use a mix of programming languages in section, but the language we use won't matter much for section activities
- Which Language Should I Use?
 - Stata: Easier now but less applicable after this class
 - Python/R: Harder now but more applicable after this class

How to ECON 1123

Assessments

- (30%) Weekly problem sets due 11:59pm on Tuesdays
 - 11 total (1 Optional pset and 1 drop)
- (25%) Midterm
- (45%) Final Exam

Assessments

- **Weekly problem sets due 11:59pm on Tuesdays**
- Midterm
- Final Exam

Assessments

- **Weekly problem sets due 11:59pm on Tuesdays**
 - Start early and go to office hours if you get stuck
 - Work in small groups to check answers and help get un-stuck
 - Keep answers short!!!
 - Look at sample code near the bottom!!!
 - Really interesting problems!

Resources

- Lecture
- Section
- Office Hours
- Slack
- Books (Mastering Metrics, Stock + Watson)

What to Focus On

- Important:
 - Interpreting results correctly
 - Finding potential flaws in studies and their conclusions
- Still important but not quite as important for this class:
 - Math behind regression (especially proofs)
 - Coding

Questions?

Lecture Recap

Hypothesis Testing

- Start with a null hypothesis
- Assuming that hypothesis is true, what's the probability of getting the data we got
- if that probability is low enough, assume the null hypothesis is false

Central Limit Theorem

- Sampling Distribution of the mean is normally distributed
- This is important for economic data because almost nothing is normally distributed!
- Allows us to run tests, build CIs, etc.

$$\widehat{var}[Y_i] = \frac{1}{N-1} \sum_{i=1}^N (Y_i - \bar{Y})^2$$

Confidence Intervals

- After building a model, we can create a confidence interval!
- These are super helpful and it's important that we interpret them correctly:
 - Contains the true value in 95% of repeated samples
 - Range of possible values that can't be rejected with a 5% significance hypothesis test

$$\bar{Y} \pm 1.96 \times \widehat{SE}(\bar{Y})$$

This week: Difference in means

- Look into one thing that is different between two groups
- One way we can do this is by measuring the mean of each group, then comparing those two values
- A better way of doing this is to build a linear model (regression) with an indicator variable (0 or 1) indicating which group someone is a part of. (Drawing to illustrate why this works)
- Why is this better? It generalizes better to future applications

Pooled vs. Robust Standard Errors

- We have to estimate standard errors in our samples
- Statisticians sometimes pool standard errors across the sample regardless of type.
- We will **never** do this. It has marginal benefits that don't matter much in large datasets, and often is not consistent with economic data.
- Why not?

Exercises!