

Introduction to Statistics I

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Topic 1: Data & Variables

Reasoning from Data

What is data, where are we collecting it from?



Observational Unit (obv-unit): The person, place, or thing from which data is collected.

Variable (var): property of an obv-unit that can be assigned a **number** or **category**.

Examples:

♦ Cost of a textbook



♦ Student loan debt



♦ Domestic cat lifespan



♦ Whether or not a college is private or public

Vars vary from obv-unit to obv-unit. (most important thing to remember from this slide)

If property is same for all obv-units, it's not a var!

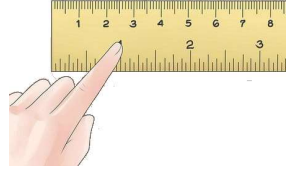
When considering whether a property is a var, think about obv-unit. Does it apply to that specific obv-unit?

Example:

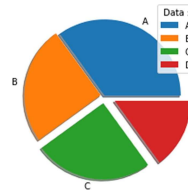
- ♦ % of students at each college who graduate in four yrs is not a var for students (but is a var for colleges)
- ♦ Whether or not each student graduated in 4 years is a var for students (but not for colleges)

Variable Types

- ♦ **Quantitative:** Assigns a number (can do math on it)



- ♦ **Categorical:** Assigns a category



If it only has two categories (yes/no or either/or), it is called a **binary variable**.

Examples: Let students be obv-units. Which of following are quantitative or categorical?

- ▶ Have you made more outgoing calls or received more incoming calls today, or the same # of each?
- ▶ What is the average duration of calls you've made today?
- ▶ Is your cell phone an iPhone or not?
- ▶ At what time did you receive your first call today?
- ▶ What was the area code to which you made your first call today?



A **research question (RQ)** is a question about *patterns* in a var,
or *compares* a var across different groups, or looks for a *relationship* between vars.

Examples:

- ▶ Do Gen-Z students make fewer calls than Millennials?
- ▶ What's average # of calls Le Moyne students make a day?
- ▶ Which area code do students most frequently call?



Activities: 1-2, 1-3

What did we learn?

- ◆ **Defined:** observational unit (obv-unit)/variable (var)/research question (RQ)
- ◆ **Variable Types:** Quantitative/Categorical (Binary?)

