

# Stat 104 – Lecture 1

## Course Objectives

- Develop Statistical Thinking.
  - Display and summarize data.
  - Evaluate probabilities.
  - Use statistical methods to reach informed decisions.

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## Prerequisites

- Make sure you can do basic algebra.
  - There will be a pre-test in lab.
- Make sure you can use a calculator.
  - Bring your calculator to lab.

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## How can I do well in this class?

- Attend all lectures and pay attention.
- Attend all labs and participate.
- Complete all assignments.
- Go over answers to assignments.

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# Stat 104 – Lecture 1

## How can I do well in this class?

- READ and STUDY the textbook.
- Ask questions.
- Form study groups.

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## What Is Statistics?

- Statistics is a way of reasoning about and understanding the world around us.
- Statistics helps us use data to learn and to make informed decisions.

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## Statistics in a Word

- Statistics is about ...variation.
  - The world is full of data.
  - Data exhibit variation.
  - Recognizing, displaying and quantifying variation in data can help us make sense of the world.
  - Try to explain variation.

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# Stat 104 – Lecture 1

## Class activity

- Heights of Stat 104 students
- Everyone in first two rows come forward.
- Is there variability in student heights?

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## Class activity

- Arrange students from tallest to shortest.
- Find person in the middle (median height).
- Look at the group of taller students and the group of shorter students. What do you notice?

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## Class activity

- There are more men among the taller students and there are more women among the shorter students.
- Gender can explain some of the variability in height.

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# Stat 104 – Lecture 1

## Terms

- **Population:** All items of interest.
  - All students in Stat 104 C
- **Variable:** Height (inches)
  - Numerical variable
- **Sample:** A few items from the population.
  - The students in the first two rows

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## Terms

- **Statistic:** Numerical summary of the sample data.
  - Average height of students in the first two rows.
- **Parameter:** Numerical summary of the population.
  - Average height of all students in Stat 104 C.

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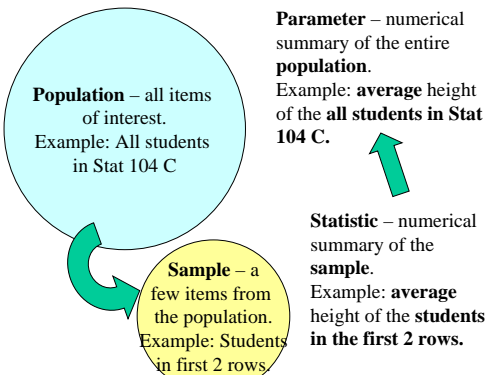
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# Stat 104 – Lecture 1

## Statistics involves

- Design – planning how to obtain data.
- Description – summarizing data.
- Inference – making decisions based on data.

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## Poll on the Environment

- Pew Research Center conducted November 9-14, 2011
- “From what you’ve read and heard, is there solid evidence that the average temperature on earth has been getting warmer over the past few decades, or not?”

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## Poll on the Environment

- Design – select a random sample of 2,011 U.S. adults.
- Description – 38% of the sample answered yes and believed the earth is getting warmer mostly because of human activity.

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# Stat 104 – Lecture 1

## Poll on the Environment

- Inference – between 35% and 41% of the entire population of U.S. adults would answer yes and say the earth is getting warmer mostly because of human activity.

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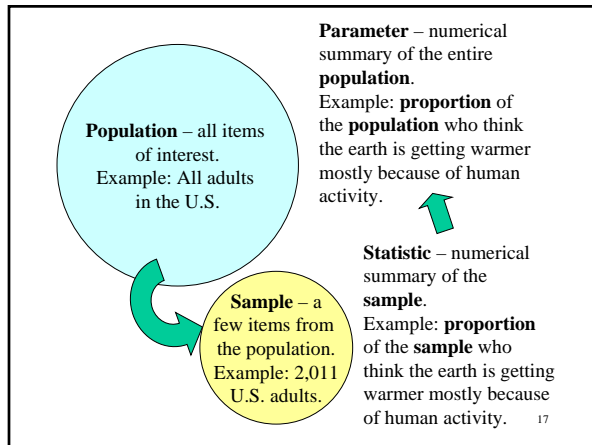
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## Data

- Information
- Context is important
  - **Who** are we collecting data on?
    - Cases: Rows in a data table.
  - **What** data are we collecting?
    - Variables: Columns in a data table.

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# Stat 104 – Lecture 1

<i>Acacia bonariensis</i>	Moist	1.59	35	59	94
<i>Dendropanax arboreus</i>	Moist	1.46	25	31	56
<i>Heliocarpus americanus</i>	Moist	2.36	30	40	70
<i>Margaritaria nobilis</i>	Moist	1.84	24	23	47
<i>Pouteria macrophylla</i>	Moist	1.55	57	46	103
<i>Bougainvillea modesta</i>	Dry	2.19	12	12	24
<i>Chrysophyllum gonocarpum</i>	Dry	1.42	59	70	129
<i>Jacaratia</i> sp.	Dry	2.12	21	50	71
<i>Phyllostylon rhamnoides</i>	Dry	1.49	18	21	39
<i>Sweetia fruticosa</i>	Dry	1.70	28	26	54

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## Data

- Who?
  - Tropical trees/shrubs.
- What?
  - Species, type of forest
  - Average crown exposure, sugar (mg/g), starch (mg/g), nonstructural carbohydrate (mg/g)

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## What?

- Variables
  - Categorical (Qualitative) variable
    - Species
    - Type of forest
  - Numerical (Quantitative) variable
    - Crown exposure
    - Sugar, starch, and NCH concentration

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