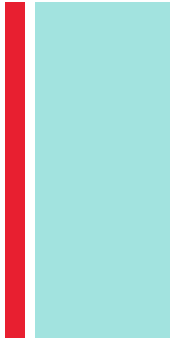




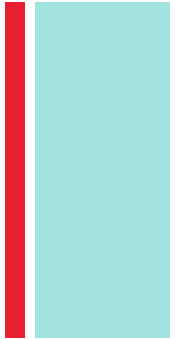
# Friday's AGENDA - Aug 2022



- Warm-UP
- Review Expectations, & Norms
- Intro to Statistics & HW
- Reading time & HW Time
- *Friday **Field Trip**??*
- Next CLASS – Practice **QUIZ #1**



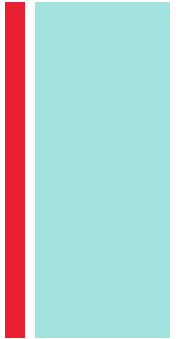
# General Class Reminders:



- Start on time, end on time
- Please **keep phones put away** unless we are using them for an activity. **Note:** Mr. L. will ask to take your phone if you're using it without permission.
- Warm-Ups: Whenever we have warm-ups, you are expected to write the problems (what are you trying to find?) and your solution, with work.
- Class Meetings  $\neq$  *Spectators sport*
- Questions, concerns?



# Warm-Up



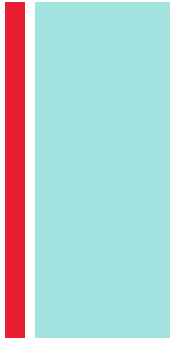
1) The two major branches of statistics are \_\_\_\_\_ and \_\_\_\_\_

2) A sample that consists of people who choose for themselves to participate by responding to a general invitation is called a \_\_\_\_\_

3) What is this is the formula for:  $\bar{x} = \sum \frac{x_i}{n}$



# Warm-Up      ANSWERS



- 1) The two major branches of statistics are descriptive statistics and inferential statistics
- 2) A sample that consists of people who choose for themselves to participate by responding to a general invitation is called a voluntary response sample .

# + Warm-Up      ANSWERS

Sample mean =  $\bar{x}$

Greek symbol for Sigma (upper case) =  $\Sigma$

$\Sigma$  means “summation”

What does this ratio signify:  $\frac{x_i}{n}$

$x_i \rightarrow i = \text{individual observations}$

$n = \text{sample size}$

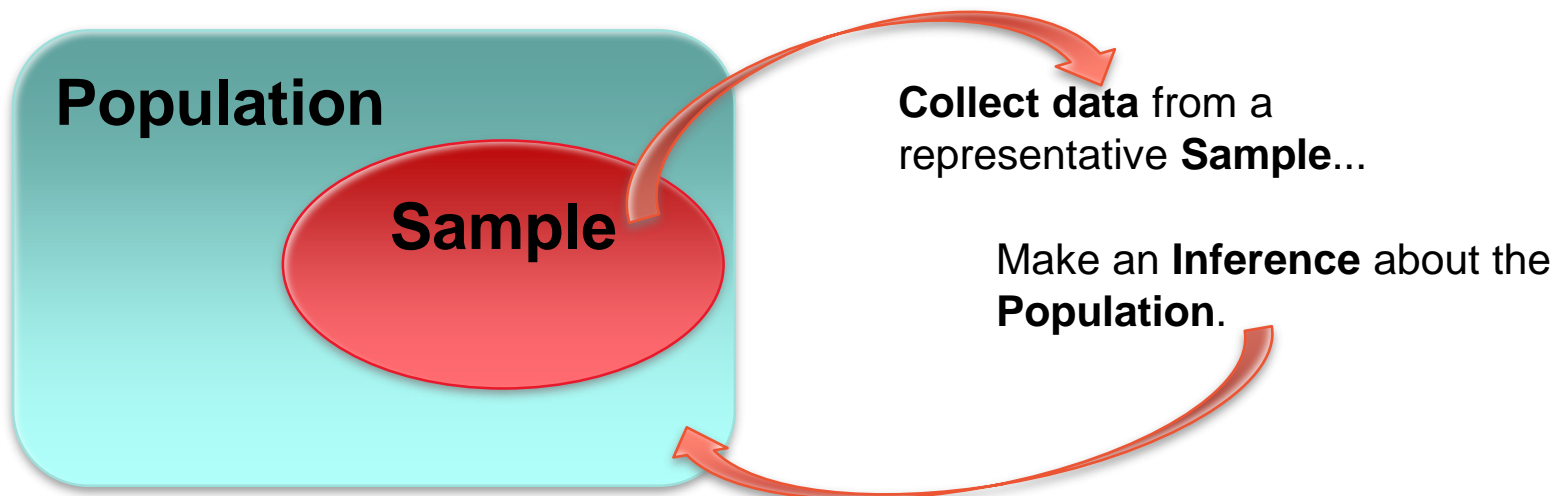
## ■ REVIEW: Population and Sample

The distinction between population and sample is basic to statistics. To make sense of any sample result, you must know what population the sample represents

### Definition:

The **population** in a statistical study is the entire group of individuals about which we want information.

A **sample** is the part of the population from which we actually collect information. We use information from a sample to draw conclusions about the entire population.





# Role of Statistics & the Data Analysis Process

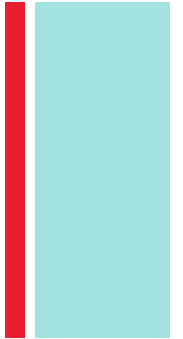
**Introduction**

**Data Analysis: Making Sense of Data**



# **Introduction of Statistics**

## **Role of Statistics & the Data Analysis Process**



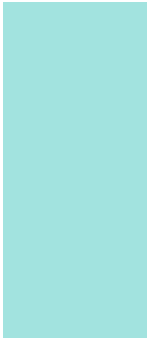
- Statistics, Variability, and the Data Analysis Process
- Types of Data & Graphical Displays of Data





# Introduction

## Data Analysis: Making Sense of Data



### Learning Objectives

After this section, you should be able to...

- ✓ DEFINE “Individuals” and “Variables”
- ✓ DISTINGUISH between “Categorical” and “Quantitative” variables
- ✓ DEFINE “Distribution”
- ✓ DESCRIBE the idea behind “Inference”

- **Statistics** is the science of data.
  - **Data Analysis** is the process of *organizing, displaying, summarizing, and asking questions* about data.

**Definitions:**

**Individuals** (*or Observations*) – objects (people, animals, things) described by a set of data

**Variable** - any characteristic of an individual

**Categorical Variable**

– places an individual into one of several groups or categories.

**Qualitative** = *categorical*

**Numerical Variable**

– takes numerical values for which it makes sense to find an average.

**Quantitative** = numerical

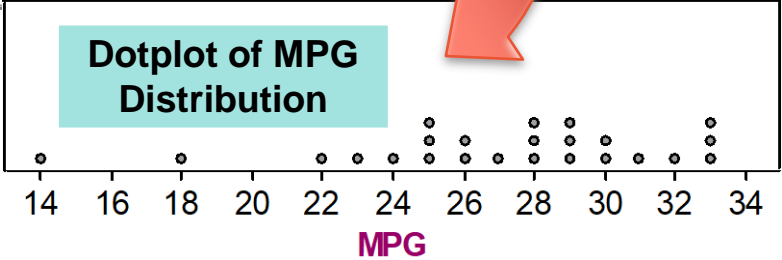
- A variable generally takes on many different values. In data analysis, we are interested in how often a variable takes on each value.

**Definition:**  
**Distribution** – tells us what values a variable takes and how often it takes those values

**Example**

MODEL	MPG	MODEL	MPG	MODEL	MPG
Acura RL	22	Dodge Avenger	30	Mercedes-Benz E350	24
Audi A6 Quattro	23	Hyundai Elantra	33	Mercury Milan	29
Bentley Arnage	14	Jaguar XF	25	Mitsubishi Galant	27
BMW 528i	28	Kia Optima	32	Nissan Maxima	26
Buick Lacrosse	28	Lexus GS 350	26	Rolls Royce Phantom	18
Cadillac CTS	25	Lincoln MKZ	28	Saturn Aura	33
Chevrolet Malibu	33	Mazda 6	29	Toyota Camry	31
Chrysler Sebring	30	Mercedes-Benz E350	24	Volkswagen Passat	29

Variable of Interest:  
**MPG**

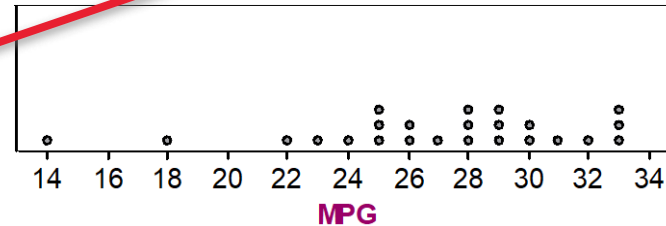


# How to Explore Data

Examine each variable by itself.  
Then study relationships among the variables.

MODEL	MPG	MODEL	MPG	MODEL	MPG
Acura RL	22	Dodge Avenger	30	Mercedes-Benz E350	24
Audi A6 Quattro	23	Hyundai Elantra	33	Mercury Milan	29
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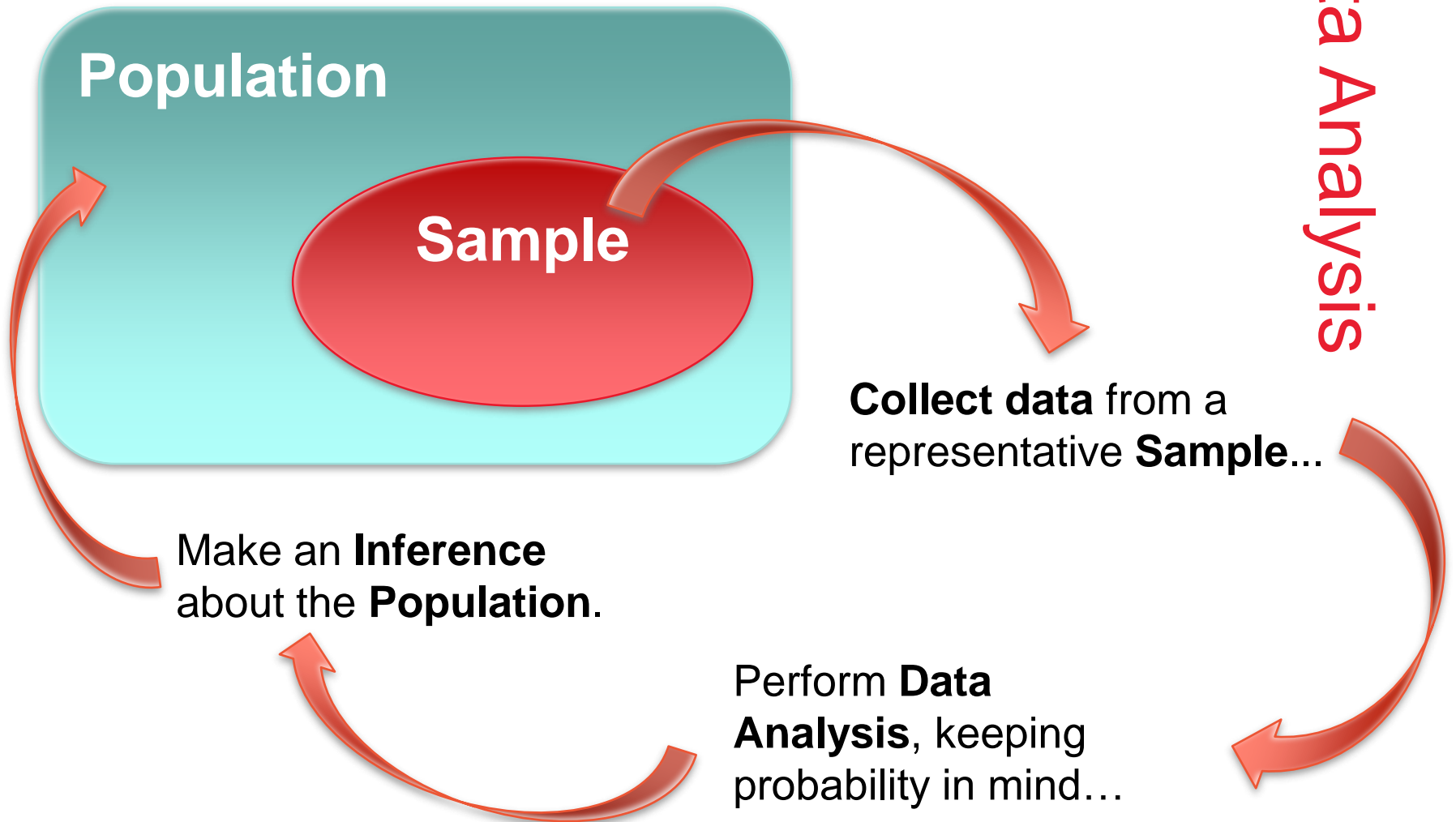
Start with a graph or graphs



Add numerical summaries

```
1-Var Stats
x̄=27
Σx=648
Σx²=17992
Sx=4.643836495
σx=4.546060566
↓n=24
```

# From Data Analysis to Inference



# + The Data Analysis Process (taken from textbook)

- Understanding the nature of the problem
- Deciding what to measure and how to measure it
- Data Collection
- Data Summarization & preliminary analysis
- Formal data analysis
- Interpretation of results

■ Let's talk  
about stats  
BABY!

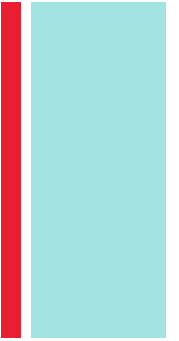


## Prob & Stats - HW AUG/Sept 2022

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7	8	9	10 Red	11 Welcome to STATS! Introduction/Syllabus HW 1: ACT Practice	12 Red	13
14	15 Introduction WS GC: Topics for Math?	16 Red	17 HW 2: Order of Operations WS HW 3: Intro Video	18 Red	19	20
21	22 Red	23 HW 4: Paulos w/ 8 questions Practice Quiz	24 Red	25 QUIZ 1 Intro Stats Concepts HW 5: ACT Practice	26 Red	27
28	29 Reading Statistics HW 6: ACT Practice Extra Credit	30 Red  Open House	31 HW 7: Review WS	1 Red SEPTEMBER Crimson Hour Sched	2	3
4	5 Labor Day NO School	6 Red	7	8 Red	9 Test #1 review Review Day HW 7: Review WS	10
11	12 Labor Day NO School	13 Red	14 Test #1 All covered Topics HW Ck: ALL HW Due!	15 Red	16	17

# + FIRST Fun Friday

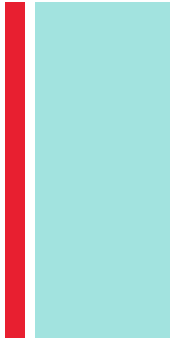
- Reading Time
- HW Time
- First *Field TRIP!*







# Let's Talk Stats...



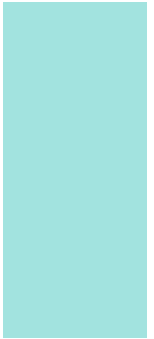
- 1.) How did deaths per year from natural disasters change in the last century?
- 2.) Worldwide, women aged 30 spent about how many (total) years in school?  
*(Note: Men of the same age spent 8 years)*
- 3.) In the last 20 years, the percent of people living in extreme poverty has...





# Introduction

## Data Analysis: Making Sense of Data



### Summary

In this section, we learned that...

- ✓ A **dataset** contains information on **individuals**.
- ✓ For each individual, data give values for one or more **variables**.
- ✓ Variables can be **categorical** or **quantitative**.
- ✓ The **distribution** of a variable describes what values it takes and how often it takes them.
- ✓ **Inference** is the process of making a conclusion about a population based on a sample set of data.