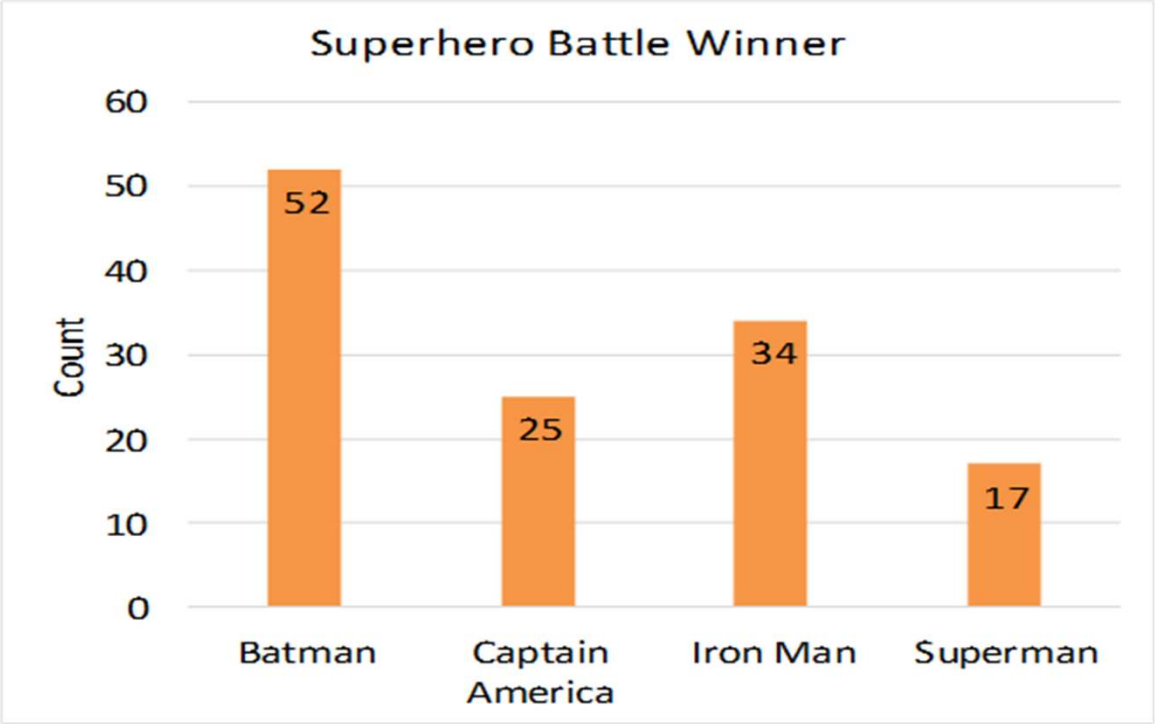
# Describing Data

# Introduction

- Descriptive Statistics allow to characterize data based on its properties.
- There are four major types of descriptive statistics:
  - Measures of Frequency
  - Measures of Central Tendency
  - Measures of Dispersion or Variation
  - Measures of Position

# Measures of Frequency

- Count, Percent, Frequency
- Shows how often something occurs
- Use this when you want to show how often a response is given



# Measures of Central Tendency

- Mean, Median, and Mode

- Locates the distribution by various points

- Use this when you want to show how an average or most commonly indicated response

# Measures of Dispersion or Variation

- Describe how similar or varied the set of observed values are.
- Include the
  - range,
  - quartiles and the interquartile range,
  - variance and
  - standard deviation
- Can be measured for quantitative data.
- Use this when
  - You want to show how "spread out" the data are.
- It is helpful to know when your data are so spread out that it affects the mean.

# Why do we measure spread?

- Summarizing the dataset can help us understand the data.
- The mode, median, and mean summarize the data into a single value. This is only part of the 'picture' that summarizes a dataset.
- Measures of spread summarize the data in a way that shows how scattered the values are and how much they differ from the mean value.

# Variance and Standard Deviation

- Variance: The average of the squared differences from the mean.
- Standard Deviation: The square root of the variance and is used to measure distance from the mean.

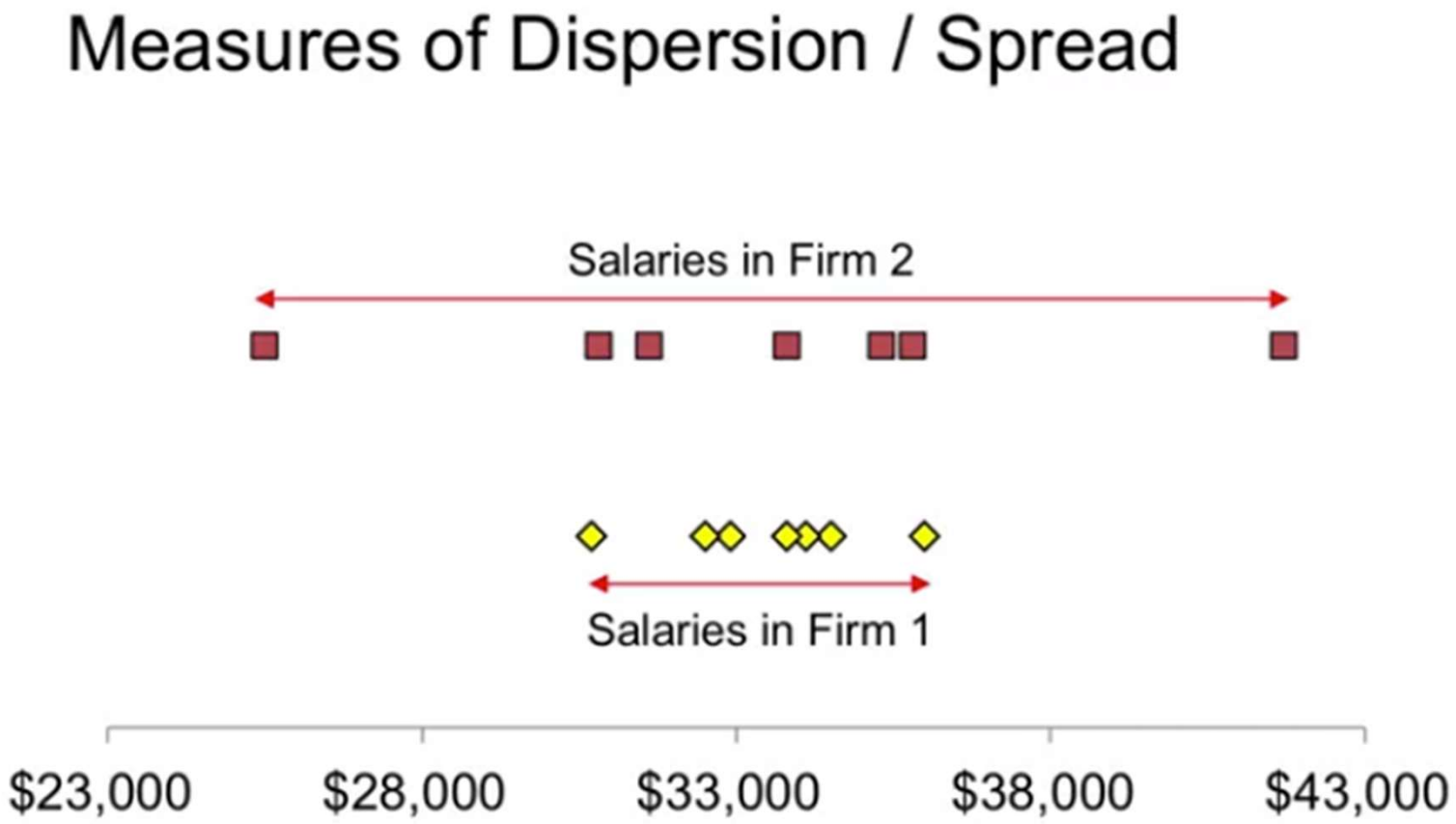
# Example

## Measures of Dispersion / Spread

| Firm 1 | Firm 2 |
|---|---|
| $34,500 | $35,800 |
| $30,700 | $25,500 |
| $32,900 | $31,600 |
| $36,000 | $41,700 |
| $34,100 | $35,300 |
| $33,800 | $33,800 |
| $32,500 | $30,800 |
| **Mean = $33,500** | **Mean = $33,500** |
| **Median = $33,800** | **Median = $33,800** |

Mean/Median is same for both.
How to define that both datasets are different?

# Example

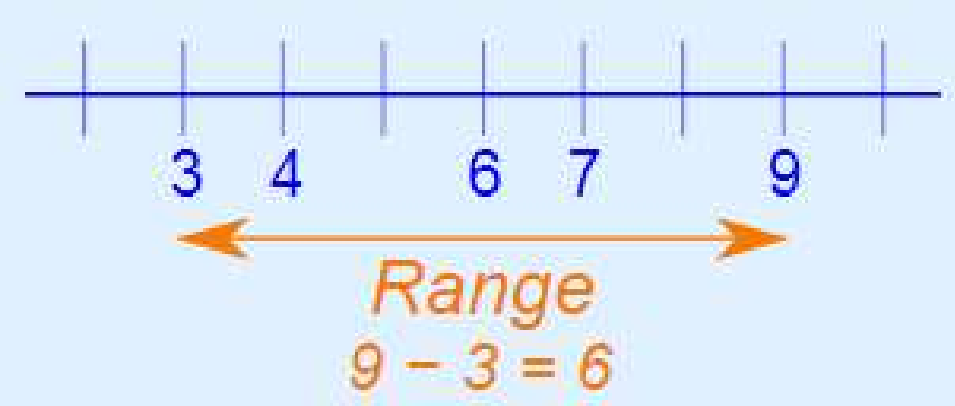

Measures of Dispersion / Spread
Salaries in Firm 2
Salaries in Firm 1
$23,000
$28,000
$33,000
$38,000
$43,000

# Range

- Difference between Maximum and Minimum
- Range = Max Value – Min Values

- Range of salaries in firm 1
- =36000 – 30700 = 5300

- Range of salaries in firm 2
- =41700– 25500= 16200




Thank
you !!!