
Data Science Unit 2

Statistics, Data, & Statistical Thinking Chapter 1

Learning Objectives

1. Define Statistics
2. Describe the Uses of Statistics
3. Distinguish Descriptive & Inferential Statistics
4. Define Population, Sample, Parameter, & Statistic

What Is Statistics?

1. **Collecting Data**
 - e.g. Survey
2. **Presenting Data**
 - e.g., Charts & Tables
3. **Characterizing Data**
 - e.g., Average

**Data
Analysi
s**



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**Decision
-
Making**



Application Areas

Economics

- Forecasting
- Demographics

Engineering

- Construction
- Materials

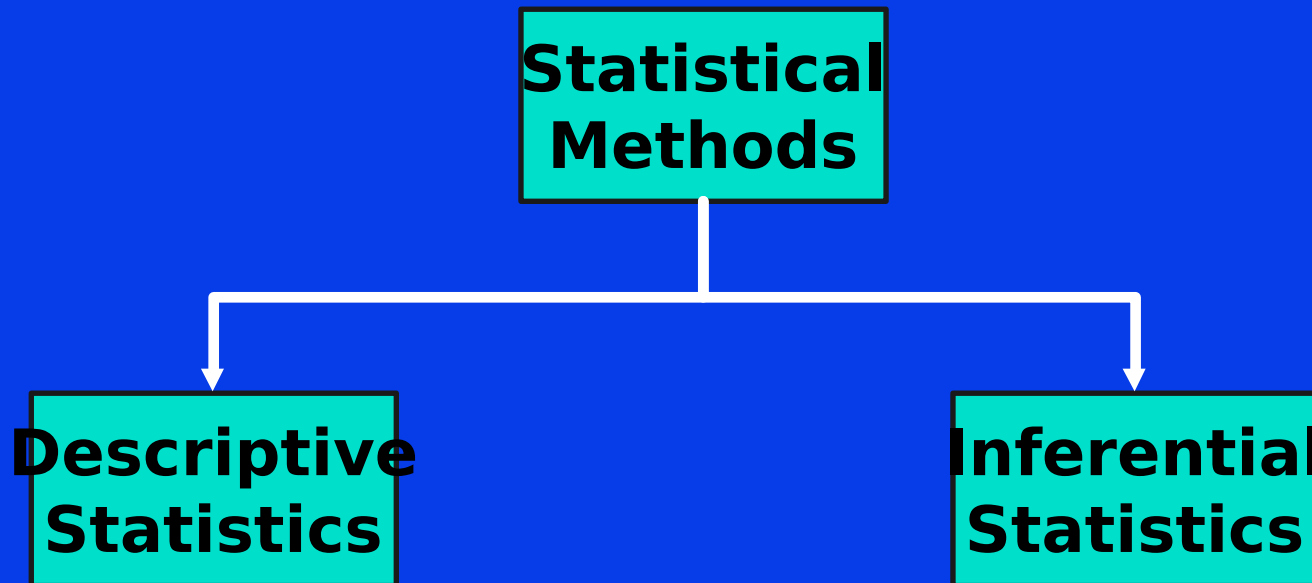
Sports

- Individual & Team Performance

Business

- Consumer Preferences
- Financial Trends

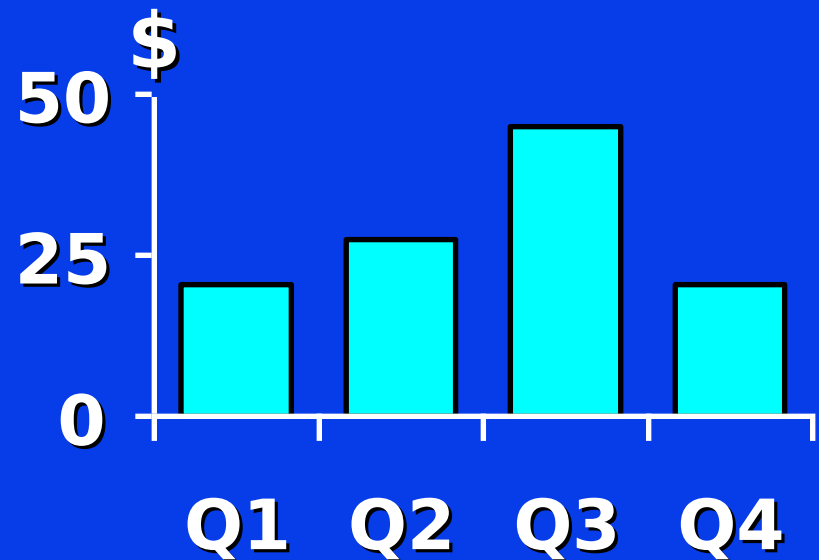
Statistical Methods



Descriptive Statistics

1. Involves

- Collecting Data
- Presenting Data
- Characterizing Data



2. Purpose

- Describe Data

$$\bar{X} = 30.5 \quad S^2 = 113$$

Inferential Statistics

1. Involves

- Estimation
- Hypothesis Testing

2. Purpose

- Make Decisions About Population Characteristics

Population?



Key Terms

1. Population (Universe)
 - All Items of Interest
2. Sample
 - Portion of Population
3. Parameter
 - Summary Measure about Population
4. Statistic
 - Summary Measure about Sample

Key Terms

1. Population (Universe)

- All Items of Interest

2. Sample

- Portion of Population

3. Parameter

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4. Statistic

- Summary Measure about Sample

- **P** in **P**opulation & **P**arameter
- **S** in **S**ample & **S**tatistic



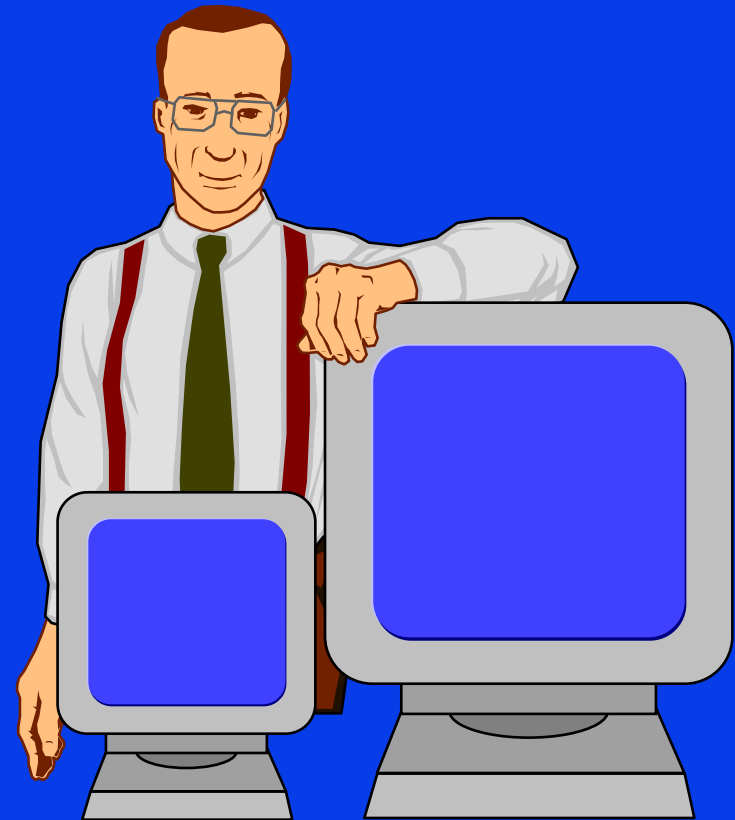
Statistical Computer Packages

1. Typical Software

- SAS
- SPSS
- MINITAB
- Excel

2. Need Statistical Understanding

- Assumptions
- Limitations



Conclusion

1. Defined Statistics
2. Described the Uses of Statistics
3. Distinguished Descriptive & Inferential Statistics
4. Defined Population, Sample, Parameter, & Statistic