

CHAPTER 1



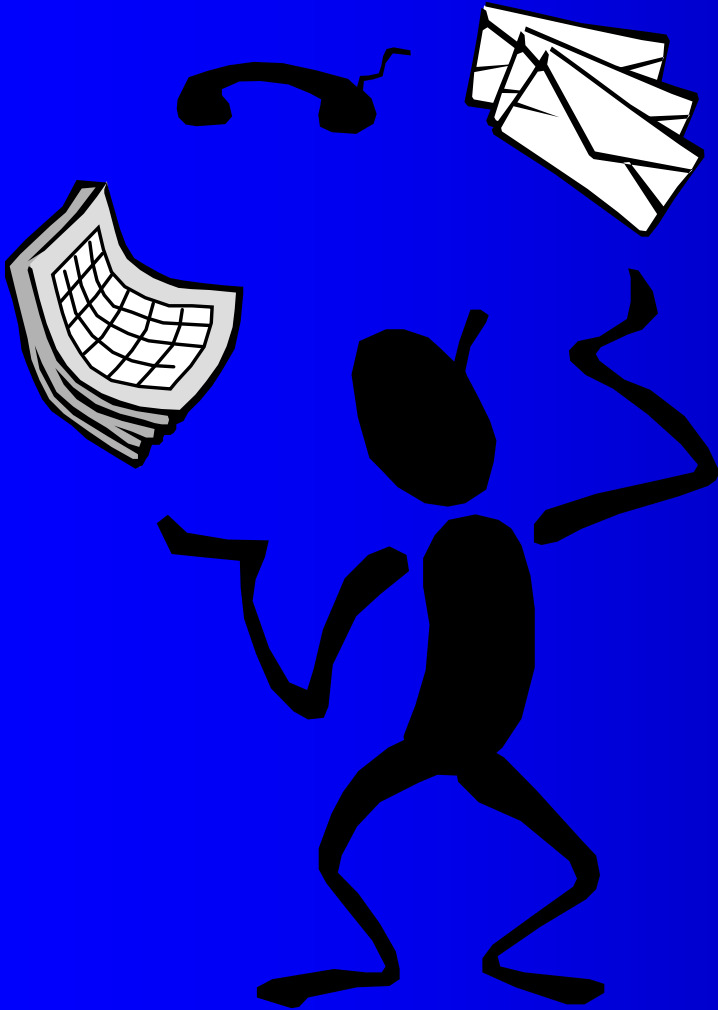
The Nature of Probability and Statistics

Objectives




- Demonstrate knowledge of statistical terms.
- Differentiate between the two branches of statistics.
- Identify types of data.
- Explain how statistics can be used and misused.
- Explain the importance of computers and calculators in statistics.

Introduction



- *Statistics(The science of Counting)* is the science of conducting studies to collect, organize, summarize, analyze, and draw conclusions from data.

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- Knowledge of statistics is the science that employs the use of scientific method in the methods of data collection, compiled and summarized and displayed and analyzed in order to access them on the conclusions and appropriate decisions .

Knowledge of statistics can be divided broadly into two main sections

Descriptive and Inferential Statistics

■ *Descriptive statistics*

consists of the Data collection in the form of digital measurements , organization, summarization, and presentation of data.

■ *Inferential statistics*

consists of generalizing from samples to populations, performing estimations hypothesis testing, determining relationships among variables, and making predictions.

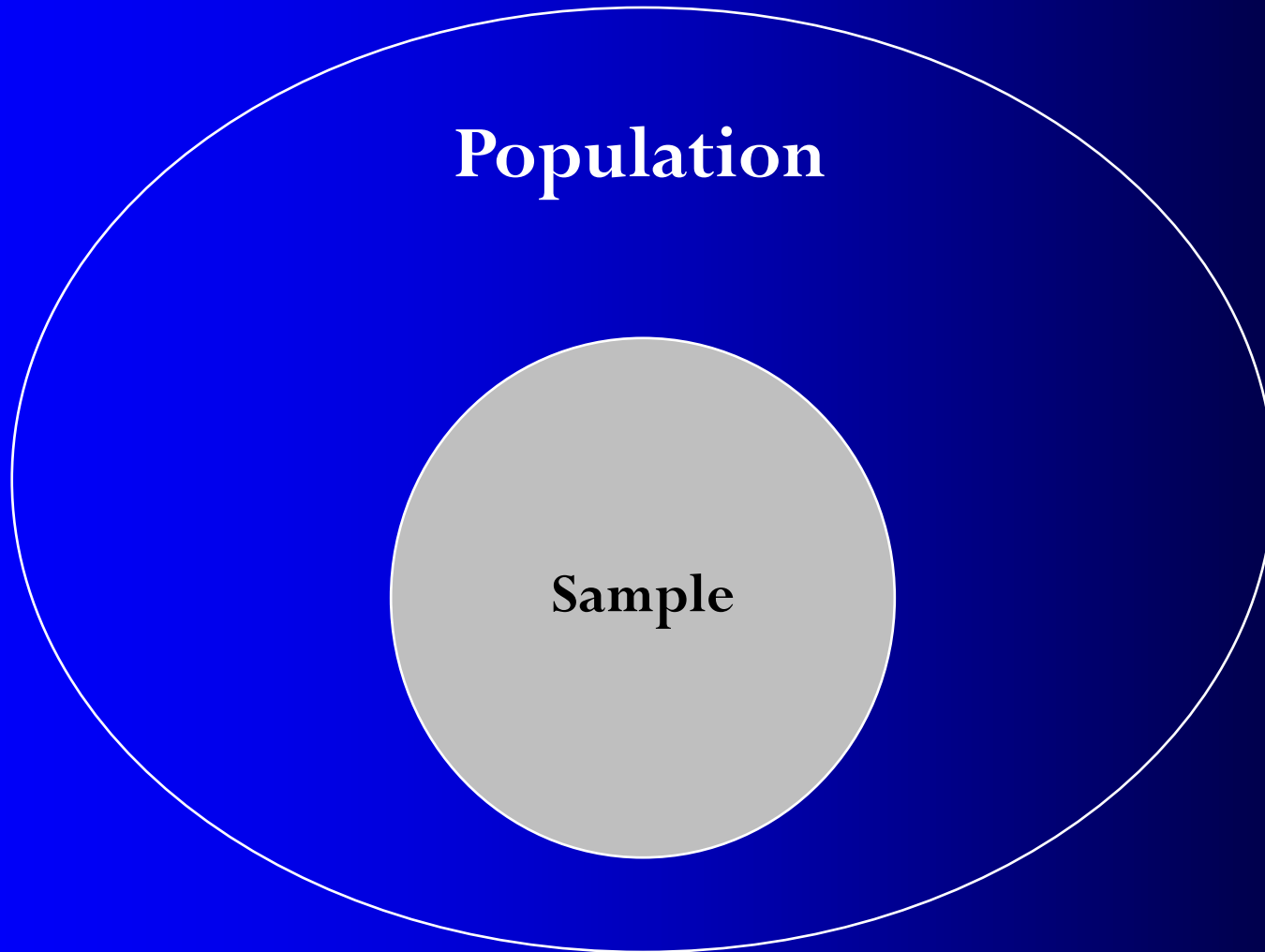
Basic Vocabulary



- *Probability* is the chance of an event occurring.
- A *population* consists of all subjects that are being studied.
- A *sample* is a group of subjects selected from a population.

So *sample subset population*

Population vs Sample



Variables and Data



- In order to gain knowledge about seemingly haphazard events, statisticians collect information for variables that describe the events.
- A *variable* is a characteristic or attribute that can assume different values.
- **Data** are the values that variables can assume.

Variables and Data (cont'd.)

- A *data set* is a collection of data values.
- Each value in the data set is called a *data value* or a *datum*.
- *Random variables* have values that are determined by chance.

Variables and Types of Data



- *Qualitative variables* can be placed into distinct categories according to some characteristic or attribute.
- *Quantitative variables* are numerical in nature and can be ordered or ranked.

Variables and Types of Data (cont'd.)

Quantitative variables can be further classified into two groups.

- *Discrete variables* assume values that can be counted. $y = 2, 3, 5, 9$
- *Continuous variables* can assume all values between any two specific values.
($1:30 < y < 1:50$)

■ .

Computers and Calculators

- In the past, statistical calculations were done with pencil and paper. However, with the advent of calculators, numerical computations became easier.



Statistical Packages



- Excel, MINITAB, and the TI-83 graphing calculator can be used to perform statistical computations.
- Students should realize that the computer and calculator merely give numerical answers and save time and effort of doing calculations by hand.

Summary

- The two major areas of statistics are *descriptive* and *inferential*.
- When the *populations* to be studied are large, statisticians use subgroups called *samples*.
- Data can be classified as *qualitative* or *quantitative*.

Conclusion

- The applications of statistics are many and varied. People encounter them in everyday life, such as in reading newspapers or magazines, listening to the radio, or watching television.

