Statistics?

GOALS

1. To understand what is statistics?
2. To know why do we study statistics?
3. Explain what is meant by *descriptive statistics* and *inferential statistics*.
4. Distinguish between a *qualitative variable* and a *quantitative variable*.
5. Describe how a *discrete variable* is different from a *continuous variable*.

What is Meant by Statistics?

- *Statistics* is the science of *collecting*, *organizing*, *presenting*, *analyzing*, and *interpreting* numerical data to assist in making more effective decisions.
- In narrower sense the term is used to denote the data themselves or numbers derived from the data like average, correlation coefficient etc. Thus we speak of production statistics, employment data etc.

What is Meant by Statistics?

- In the more common usage, statistics refers to numerical information

  Examples: the average starting salary of college graduates, the number of deaths due to alcoholism last year, the change in the Dow Jones Industrial Average from yesterday to today, and the number of home runs hit by the Chicago Cubs during the 2007 season.

- We often present statistical information in a graphical form for capturing reader attention and to portray a large amount of information.

Formal Definition of Statistics

- **STATISTICS** The science of *collecting*, *organizing*, *presenting*, *analyzing*, and *interpreting* data to assist in making more effective decisions.

Some examples of the need for data collection.

1. Research analysts for Merrill Lynch evaluate many facets of a particular stock before making a "buy" or "sell" recommendation.
2. The marketing department at Colgate-Palmolive Co., a manufacturer of soap products, has the responsibility of making recommendations regarding the potential profitability of a newly developed group of face soaps having fruit smells.
3. The United States government is concerned with the present condition of our economy and with predicting future economic trends.
4. Managers must make decisions about the quality of their product or service.

Why Study Statistics?

1. Numerical information is everywhere
2. Statistical techniques are used to make decisions that affect our daily lives
3. The knowledge of statistical methods will help you understand how decisions are made and give you a better understanding of how they affect you.

No matter what line of work you select, you will find yourself faced with decisions where an understanding of data analysis is helpful.

Who Uses Statistics?

- Statistical techniques are used extensively by marketing, accounting, quality control, consumers, professional sports people, hospital administrators, educators, politicians, physicians, etc...

Types of Statistics – Descriptive Statistics and Inferential Statistics

- Descriptive Statistics - methods of organizing, summarizing, and presenting data in an informative way.

EXAMPLE 1: The World Bank reports that the population of Afghanistan in 2018 is 37,172.39 thousands, of Australia is 24,982..69 thousands, of India is 1,352,617.33 thousands and of Brazil 209,459.33 thousands.

Types of Statistics – Descriptive Statistics and Inferential Statistics

- Inferential Statistics: A decision, estimate, prediction, or generalization about a population, based on a sample.

- Note: In statistics the word *population* and *sample* have a broader meaning. A population or sample may consist of ***individuals*** or ***objects.***