



Lecture 1 – Introduction to Statistics, Data and Graphing Data

Learning Objectives

- How Statistics is used in business
- The types of data – qualitative variable and quantitative data.
- Measurement properties of data – Distinguish among the nominal, ordinal, interval, and ratio levels of measurement
- Graphical presentation of data

Chapter 1 – Introduction to Statistics


TYPES OF STATISTICS

- **Statistics** is a branch of mathematics that transforms data into useful information for decision makers.
-  **Descriptive statistics** – collecting, summarising and describing data.
-  **Inferential statistics** – drawing conclusions and/or making decisions concerning a population based only on sample data.

PROCESS OF DESCRIPTIVE STATISTICS

- Collect data
 - E.g. Survey
- Present data
 - E.g. Tables and graphs
- Characterise data
 - E.g. Sample mean = $\frac{\sum x_i}{n}$

PROCESS OF INFERENTIAL STATISTICS

- Estimation
 - E.g. estimate the population mean weight using the sample mean weight.
- Hypothesis testing
 - E.g. test the claim that the population mean weight is 100kgs
-  **Drawing conclusions about a large group of individuals based on a subset of the large group.**

1.1. STATISTICS IN BUSINESS

- **Statistics** is a mathematical science concerned with the collection, presentation, analysis and interpretation or explanation of data.
- The aim of **BUSINESS STATISTICS** is to extract the best possible information from data and use it to make business decisions.

BASIC VOCABULARY OF STATISTICS

- A **population** is a collection of **all** possible individuals, objects, or measurements of interest.
- A **sample** is a **portion, part, or subset** of the population of interest.

POPULATION VERSUS SAMPLE

- Measures used to describe the population are called **parameters**.
- Measures computed from sample data are called **statistics**.

1.2. BASIC STATISTICAL CONCEPTS

- A **population** is a collection of objects (often called units or subjects) of interest.
 - E.g. all small businesses, all workers currently employed by BHP Billiton, etc.
 - ❖ Collection of data on a whole population is called a **census**.
- A **sample** is a subset of the units in a population.
 - ❖ A sample can be expected to be representative of the whole population.
- There are two steps in analysing data from a sample – EDA and statistical inference.