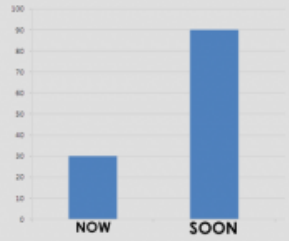
What is Statistics?

Chapter 1

YouTube BY THE NUMBERS

AUSTRALIAN EDITION



30% of online content is video content.

that figure will soon increase to **90%**

10.5 million Australians watch video content online.

48 hour's worth of video is uploaded to YouTube EVERY MINUTE.

MOST TRAFFIC OCCURS AT:

6-8pm weekdays

8-11pm weekends

150 year's worth of YouTube video has been watched through Facebook.

1 in 4 YouTube videos are shared with friends

400 tweets each minute contain a YouTube link.

data provided by Suzie O'Carroll from YouTube

SOCIAL MEDIA MARKETING

E-WEB MARKETING

Learning Objectives

LO1 List ways statistics is used.

LO2 Know the differences between descriptive and inferential statistics.

LO3 Understand the differences between a sample and a population.

LO4 Explain the difference between qualitative and quantitative variables.

LO5 Compare the differences between discrete and continuous variables.

LO6 Recognize the levels of measurement in data.

LO1 List ways statistics is used.

Uses of Statistics

- Statistics is one of the tools used to make decisions in business
- We apply statistical concepts in our lives
- As a student of business or economics, basic knowledge and skills to organize, analyze, and transform data and to present the information.

LO1

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.

LO1

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

LO2 Know the differences between descriptive and inferential statistics.

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

EXAMPLE 1: The United States government reports the population of the United States was 179,323,000 in 1960; 203,302,000 in 1970; 226,542,000 in 1980; 248,709,000 in 1990, and 265,000,000 in 2000.

EXAMPLE 2: According to the *Bureau of Labor Statistics*, the average hourly earnings of production workers was $17.90 for April 2008.

LO2

Types of Statistics – Descriptive Statistics and Inferential Statistics

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

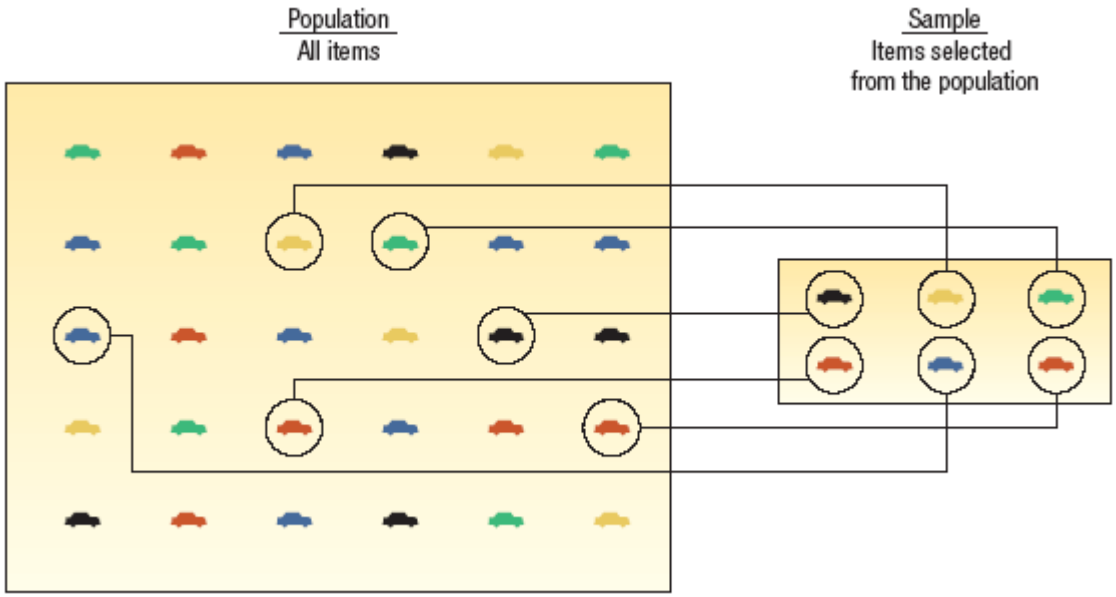
Note: In statistics the word *population* and *sample* have a broader meaning. A population or sample may consist of ***individuals*** or ***objects***

Population versus Sample

LO3 Understand the differences between a sample and a population.

A population is a collection of ***all*** possible individuals, objects, or measurements of interest.

A sample is a ***portion***, or ***part***, of the population of interest



LO3

Why take a sample instead of studying every member of the population?

1. Prohibitive cost of census
2. Destruction of item being studied may be required
3. Not possible to test or inspect all members of a population being studied

LO3

Usefulness of a Sample in Learning about a Population

Using a sample to learn something about a population is done extensively in business, agriculture, politics, and government.

EXAMPLE: Television networks constantly monitor the popularity of their programs by hiring Nielsen and other organizations to sample the preferences of TV viewers.

Types of Variables

LO4 Explain the difference between qualitative and quantitative variables.

A. Qualitative or Attribute variable - the characteristic being studied is *nonnumeric*.

EXAMPLES: Gender, religious affiliation, type of automobile owned, state of birth, eye color are examples.

B. Quantitative variable - information is reported *numerically*.

EXAMPLES: balance in your checking account, minutes remaining in class, or number of children in a family.

Quantitative Variables - Classifications

LO5 Compare the differences between discrete and continuous variables.

Quantitative variables can be classified as either *discrete* or *continuous*.

A. Discrete variables: can only *assume certain values* and there are *usually "gaps"* between values.

EXAMPLE: the number of bedrooms in a house, or the number of hammers sold at the local Home Depot (1,2,3,…,etc).

B. Continuous variable can *assume any value* within a specified range.

EXAMPLE: The pressure in a tire, the weight of a pork chop, or the height of students in a class.

LO4 and LO5

Summary of Types of Variables

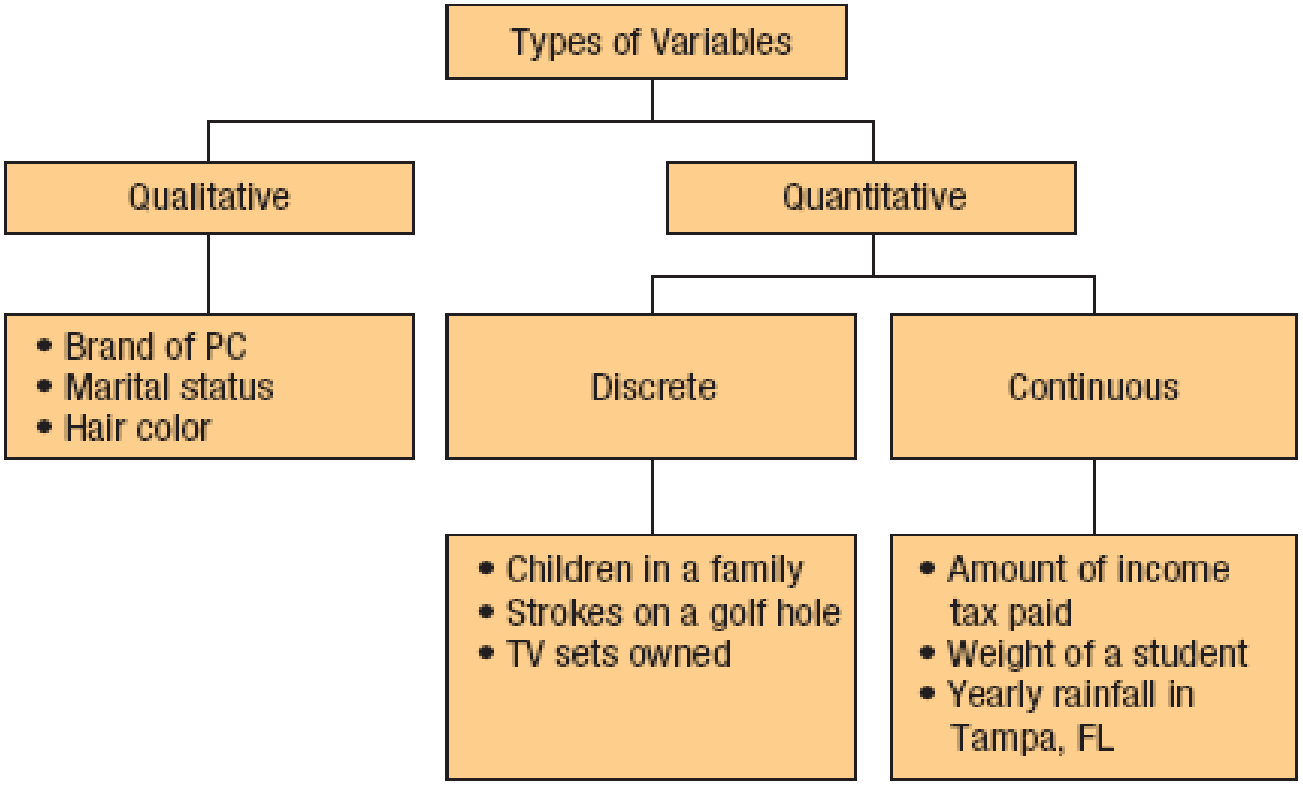


CHART 1–2 Summary of the Types of Variables

Four Levels of Measurement

LO6 Recognize the levels of measurement in data.

Nominal level – data that is classified into categories and cannot be arranged in any particular order.

EXAMPLES eye color, gender, religious affiliation.

Interval level - similar to the ordinal level, with the additional property that meaningful amounts of differences between data values can be determined. There is no natural zero point.

EXAMPLE Temperature on the Fahrenheit scale.

Ordinal level – data arranged in some order, but the differences between data values cannot be determined or are meaningless.

EXAMPLE During a taste test of 4 soft drinks, Mello Yellow was ranked number 1, Sprite number 2, Seven-up number 3, and Orange Crush number 4.

Ratio level – the interval level with an inherent zero starting point. Differences and ratios are meaningful for this level of measurement.

EXAMPLES Monthly income of surgeons, or distance traveled by manufacturer's representatives per month.

LO6

Nominal-Level Data

Properties:

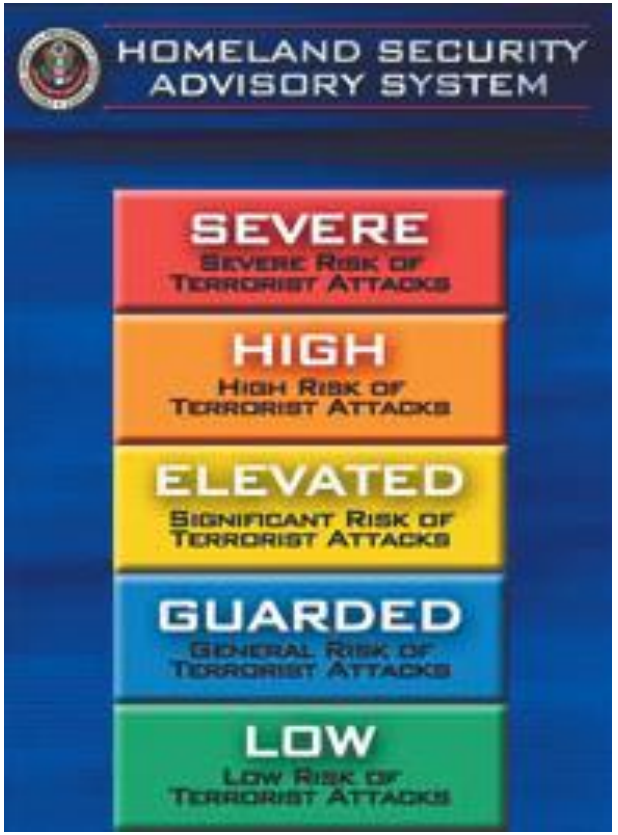
1. Observations of a qualitative variable can only be ***classified*** and ***counted***.
2. There is ***no particular order*** to the labels.

LO6

Ordinal-Level Data

Properties:

1. Data classifications are represented by sets of labels or names (high, medium, low) that have ***relative values***.
2. Because of the relative values, the ***data classified can be ranked or ordered***.



LO6

Interval-Level Data

Properties:

1. Data classifications are ordered according to the amount of the characteristic they possess.
2. Equal differences in the characteristic are represented by equal differences in the measurements.

Example: Women's dress sizes listed on the table.

Size	Bust (in)	Waist (in)	Hips (in)
8	32	24	35
10	34	26	37
12	36	28	39
14	38	30	41
16	40	32	43
18	42	34	45
20	44	36	47
22	46	38	49
24	48	40	51
26	50	42	53
28	52	44	55

LO6

Ratio-Level Data

- Practically all quantitative data is recorded on the ratio level of measurement.
- Ratio level is the “highest” level of measurement.

Properties:

1. Data classifications are ***ordered*** according to the amount of the characteristics they possess.
2. Equal differences in the characteristic are represented by equal differences in the numbers assigned to the classifications.
3. The zero point is the absence of the characteristic and the ratio between two numbers is meaningful.

LO6

Why Know the Level of Measurement of a Data?

- The level of measurement of the data dictates the calculations that can be done to summarize and present the data.
- To determine the statistical tests that should be performed on the data

LO6

Summary of the Characteristics for Levels of Measurement

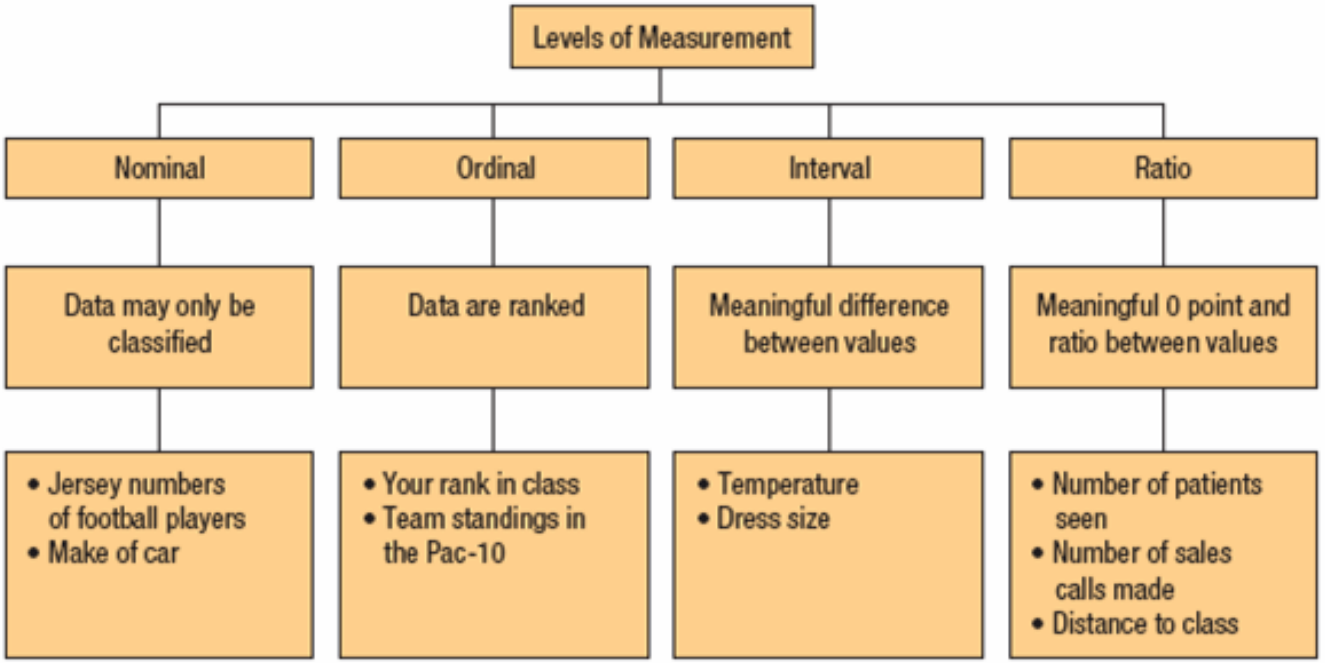


CHART 1–3 Summary of the Characteristics for Levels of Measurement