

Chapter 1

Introduction and data collection

After studying this chapter you should be able to:

1. identify how statistics is used in business
 2. recognise the sources of data used in business
 3. identify the types of data used in business
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- 1.2 Three sizes of soft drink are classified into distinct categories — small, medium and large — in which order is implied.

 - 1.4
 - (a) Numerical, discrete, ratio scale
 - (b) Numerical, continuous, ratio scale
 - (c) Categorical, nominal scale
 - (d) Categorical, nominal scale

 - 1.6
 - (a) Categorical, nominal scale
 - (b) Numerical, continuous, ratio scale
 - (c) Numerical, discrete, ratio scale
 - (d) Numerical, discrete, ratio scale

 - 1.8
 - (a) Income may be considered discrete if we 'count' our money. It may be considered continuous if we 'measure' our money; we are only limited by the way a country's monetary system treats its currency.
 - (b) The first format is preferred because the responses represent data measured on a higher scale.
 - (c) The first format would bring a greater response because it has a large number of possible income levels, as opposed to a limited number of income groups in the second format.

 - 1.10 An experiment will be carried out in artificial conditions and will try to assess people's attitudes to making charitable donations. These may differ in real-life situations. A survey of the same subjects will rely on self-reporting. Respondents may not always report accurately if they are trying to appear more generous.

 - 1.12 A population contains all the items of interest whereas a sample contains only a portion of the items in the population.

 - 1.14 Descriptive statistical methods deal with the collection, presentation, summarisation and analysis of data whereas inferential statistical methods deal with decisions arising from the projection of sample information to the characteristics of a population.

 - 1.16 Discrete random variables produce numerical responses that arise from a counting process. Continuous random variables produce numerical responses that arise from a measuring process.

1.18 The four types of measurement scales are (i) nominal scale, (ii) ordinal scale, (iii) interval scale and (iv) ratio scale.

Answers for 1.20 to 1.24 provided below are just some of the many different possible answers.

1.20 The answers to this question vary from person to person according to their experiences.

1.22 (a) Categorical variables: gender, marital status, education, country of birth, religious affiliation, languages spoken other than English.
(b) Numerical variables: weekly income, age, weekly rent, monthly mortgage payment.
(c) Discrete numerical (weekly income, age in years, weekly rent, monthly mortgage payment).

1.24 (a) The populations of interest were all school principals and P&C organisations in NSW and the ACT, and the general public of NSW and the ACT when the survey was conducted.
(b) Sample 1 consisted of respondents to the survey of principals and P&C organisations. Sample 2 consisted of respondents to the survey from the general public.
(c) If a greater proportion of responses were from the school community, there could be more concern about child safety and more observations made by pedestrians approaching the school. If a greater proportion of responses was from the general public, other issues such as irritation about poor signage for 40 km an hour school zones could predominate.

1.26 (a) The population of interest was the residents living in a north-eastern region of Sydney when the study was conducted.
(b) Categorical (ticket type and main purpose of using the bus) and numerical (resident's age and frequency of bus use).
(c) Numerical continuous questions (distance travelling) and numerical discrete (weekly income of passengers).
(d) Categorical questions (gender and social status such as students, full-time or part-time workers and pensioners).