2.2 Worksheet Characteristics of Data – Worksheet

MDM4U
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1) Identify each of the following variables as quantitative or qualitative. For each quantitative variable, identify whether it is continuous or discrete.

a) age

quantitative, usually discrete

b) favourite meal

qualitative

c) television viewing preferences

qualitative

d) speed of car

quantitative, continuous

e) colour of hair

qualitative

f) fabric texture

qualitative

g) pH of water samples

quantitative, continuous

h) seating capacity

quantitative, discrete

i) test mark

quantitative, discrete

j) paint colours

qualitative

2) Identify the variables and their types, as well as the population for the following thesis questions. Also, would you collect a sample or conduct a census? Would each question require a cross-sectional study or a longitudinal study?

a) Is there a relationship between weather conditions and absenteeism in Grade 9 at your school?

Weather condition is a qualitative variable (can be quantitative and continuous if looking at temperature). Absenteeism is a quantitative and discrete. The population is grade 9 students in our school. Sample is collected. Longitudinal study would be required to track attendance records over a period of time with different weather conditions.

b) Is there a relationship between the amount of television watched and the level of physical fitness among adult females?

Amount of television is a quantitative and continuous variable (measured in minutes). Physical fitness is a quantitative and continuous variable (using BMI). The population is adult females. Sample is collected. Cross sectional study would be easiest to do but longitudinal is an option.

c) Are teenage drivers who have been issued speeding tickets more likely to be males?

Gender is a qualitative variable. Number of female students with speeding tickets is a quantitative and discrete variable. Number of male students with speeding tickets is a quantitative and discrete variable. The population is teenagers who have been issued speeding tickets. Sample is collected. Cross-sectional study is required.

3) Consider this thesis question: *In North America, do foreign cars depreciate in value faster than domestic cars?* Now answer the questions that follow:

a) What is the population?

The population is cars in North America.

b) What are the key variables that must be considered? Are these quantitative or qualitative? If quantitative, are they discrete or continuous?

Type of car is a qualitative variable. Value of car is a quantitative discrete variable.

c) Should a census or a sample be used to collect data?

A sample should be used.

d) Is a cross-sectional or a longitudinal study more appropriate for drawing conclusions?

Cross-sectional

4) Explain the differences between each pair of terms.

a) population/sample

Population is the group being studied when sample is a selection of individual taken from the population.

b) cross-sectional study/longitudinal study

Cross-sectional study is a study that considers individuals from different groups at the same time. Longitudinal study is a study of a single group (or sample) over a long period of time.

c) quantitative variable/qualitative variable

Quantitative data are numerical and qualitative data are non-numerical.

d) discrete data/continuous data

Discrete data is data that can only take on a finite number of values within a given range. For example, number of vehicles is a discrete data. Continuous data is data that are measurable with all real numbers and therefore can take on an infinite number of values within a given range.