Chapter 2 Investigating associations between two variables: **Assignment**

Student name: _____

1 A researcher surveyed 112 Year 11 students in a certain school to determine where they would like to go for their school camp. Of the 62 females surveyed, 30 said they would like to go to the beach, while 27 of the males said they would like to go to the snow. Ten people (6 females, 4 males) named other destinations. Complete all the entries in the two-way frequency table below using gender as the explanatory variable.

2 The following table shows summarises the data collected when a group of 250 students were asked if they intended to go to university.

	Year level		
Intends to go to university?	Year 9	Year 11	Total
Yes	78	84	162
No	52	36	88
Total	130	120	250

a Which is the explanatory variable, and which is the response variable?

b Use this data to construct a percentaged two-way frequency table.

c Is there an association between *Year level* and *Intends to go to university*? Quote appropriate percentages in your response.

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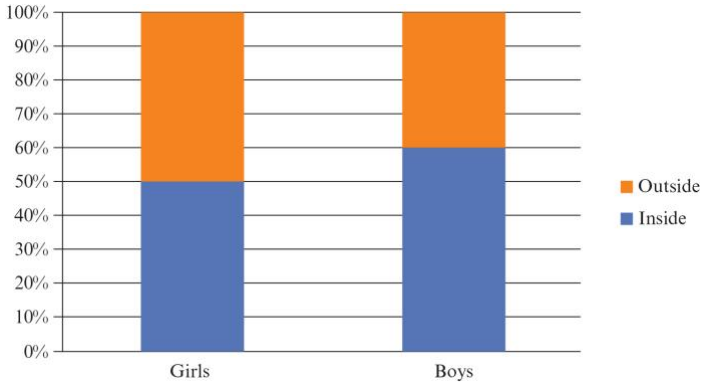
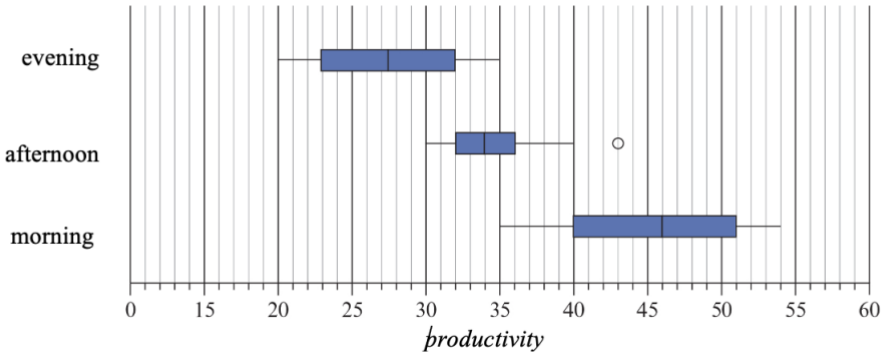
3 A group of preschool children were asked whether they preferred to pay indoors or outdoors at pre-school. The results are summarised in the following percentaged segmented bar chart:



a What percentage of the boys preferred to play outside?

b Is there an association between the variables? Quote appropriate percentages in your response.

4 A plant manager was interested in the effect of time of day on the productivity of workers on the production line of a large assembly plant. The manager expects to find a difference in productivity between the shifts. The following data records the number of units assembled per hour for each time period for randomly selected samples of workers.



a The two variables are *shift* and *productivity*. Which of these variables is numerical, and which is categorical?

b Is there an association between shift and productivity? Use the boxplots to compare these distributions and quote appropriate statistics in your response.

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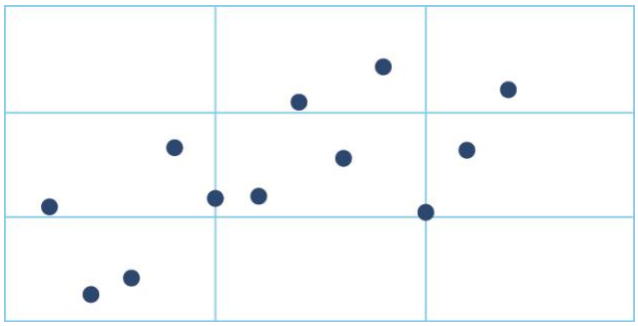
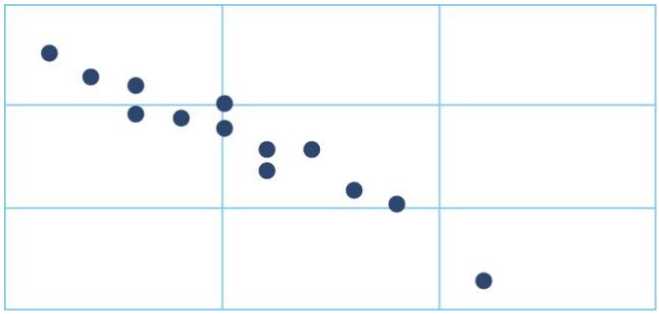
5 Describe the associations shown in the scatterplots below in terms of direction and strength, and give an estimate of the value of the correlation coefficient:

a

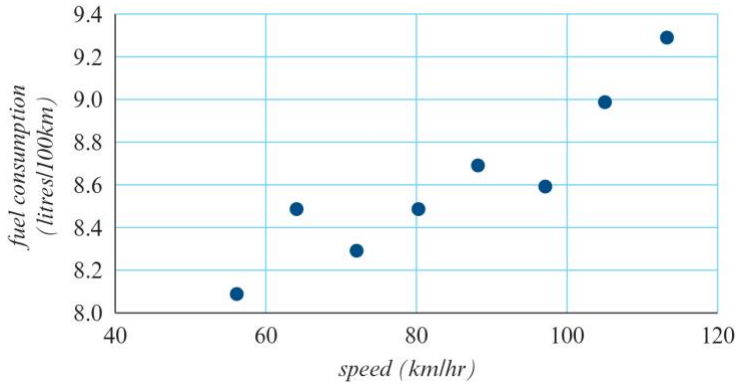


b



6 The following table gives the average speed at which a car was driven around a test track, and the resulting fuel consumption of the car when driven at that speed. A scatterplot of the data is also shown.

speed(km/hr)	56	64	72	80	88	97	105	113
fuel consumption (litres/100km)	8.1	8.5	8.3	8.5	8.7	8.6	9	9.3



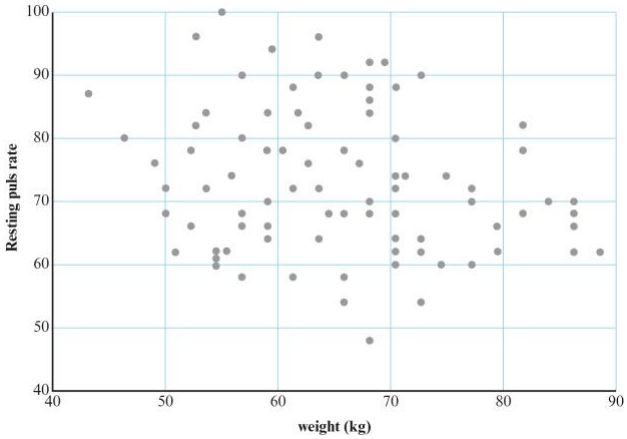
a Identify the response variable and the explanatory variable.

b From the scatterplot, describe the association between *fuel consumption* and *speed*.

c Find the value of the correlation coefficient to four decimal places, and classify according to strength.

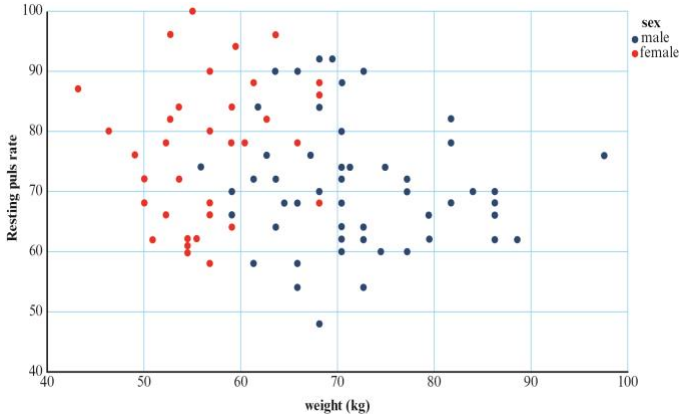
d Determine the value of the coefficient of determination and interpret. Give your answers as a percentage rounded to one decimal place.

7 In order to investigate the relationship between resting pulse rate and weight, researchers collected data from a group of adults. The data is displayed in the scatterplot below.



a For this set of data the correlation coefficient was found to be r = –0.3. Interpret this value of r in terms of the variables in the question.

Researchers repeated the scatterplot, this time using different symbols for males and females.



b Discuss the effect the introduction of the variable gender would have on the values of the correlation coefficient between weight and resting pulse rate if the correlation coefficient was calculated separately for males and females.