Section 1.4 Worksheet – Scatterplots and Correlation vs. Causation

MDM4U
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Refer to Part 2 of the 1.4 lesson for help with the following question

1) Identify the explanatory and the response variable in a correlation study of

   a) heart disease AND cholesterol level
   b) hours of basketball practice AND free---throw success
   c) amount of fertilizer used AND height of plant
   d) income AND level of education
   e) running speed AND pulse rate

Refer to Part 3 of the 1.4 lesson for help with the following question

2) Classify the direction of linear correlation that you would expect with the following pairs of variables

   a) hours of study, examination score
   b) speed in excess of the speed limit, amount charged on a traffic fine
   c) hours of television watched per week, final mark in calculus
   d) a person's height, sum of the digits in the person's phone number
   e) a person's height, the person's strength

3) For a week prior to their final physics exam, a group of friends collect data to see whether time spent studying or time spent watching TV had a stronger correlation with their marks on the exam.

Hours Studied	Hours Watching TV	Exam Score
10	8	72
11	7	67
15	4	81
14	3	93
8	9	54
5	10	66

a) Create a scatter plot of hours studied versus exam score. Classify the linear correlation.

b) Create a scatter plot of hours watching TV versus exam score. Classify the linear correlation.

c) Which explanatory variable has a stronger correlation with exam scores? Explain.

4) Every year, students at a local high school collect money for a local charity. They keep track of the number of students who participate, as well as the amount of money that is collected. The information for the past five years is listed in the table below.

Year	Number of Students	Amount Collected ($)
1	130	2250
2	125	2875
3	135	2500
4	147	2300
5	153	2000

a) Create a scatterplot of the data

b) Describe the correlation that is observed in the data