

MATHEMATICS 201-510-LW

Business Statistics

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IV – Correlation and Regression

1. Some students claim they can tell the cost of a textbook just by looking at its thickness. To test this claim they picked 4 hardbound books of the same height and width at random. The cost and thickness for each book was

x (Thickness in cm)	1.3	3.5	2.6	4.1
y (Cost in \$)	72	88	65	105

- a) Find the equation of the least-squares line.
 - b) Draw a scatter diagram that includes the least-squares line.
 - c) If a book has a thickness of 2.2 cm, what is the predicted cost of the book?
 - d) Find the coefficient of correlation.
 - e) Find the coefficient of determination.
 - f) Is the correlation positive or negative? Perfect, high, moderate or low?
2. Do reading and TV viewing compete for leisure time? To find out, a communication specialist interviewed a sample of children regarding the number of books they had read during the last year and the number of hours they had spent watching TV on a daily basis.

Daily Hours of TV Viewing	Yearly Number of Books Read
3	0
1	7
2	2
2	1
0	5
1	4
3	3
2	3
7	0
4	1

- a) Find the equation of the least-squares line.
- b) Draw a scatter diagram that includes the least-squares line.
- c) If a child watches two hours of TV per day, how many books is he expected to read during one year?
- d) Find the coefficient of correlation.
- e) Find the coefficient of determination.
- f) Is the correlation positive or negative? Perfect, high, moderate or low?

3. Eight people applying for a job as a graphic designer were given two tests, one measuring the applicant's logical reasoning ability (on a scale of 1 to 20), the other measuring the applicant's creativity (on a scale of 1 to 30). Here are the results

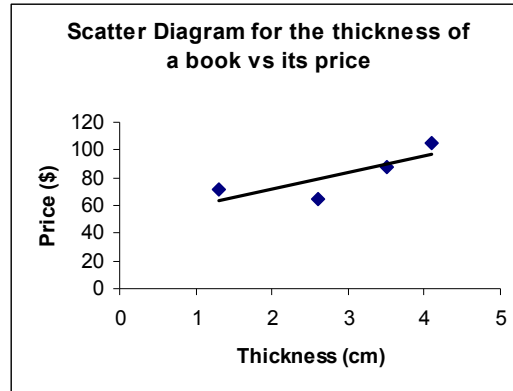
Reason (scale 1 to 20)	Creativity (scale 1 to 30)
13	18
13	20
18	31
14	25
9	23
9	21
5	5
10	21

- Find the equation of the least-squares line.
 - Draw a scatter diagram that includes the least-squares line.
 - If a person scores 12 on the logical reasoning, what can he be expected to score on creativity?
 - Find the coefficient of correlation.
 - Find the coefficient of determination.
 - Is the correlation positive or negative? Perfect, high, moderate or low?
4. Do questions 1 - 3 on Excel.

ANSWERS

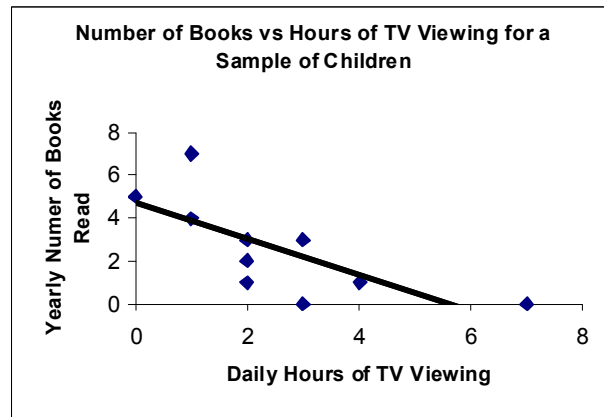
1. a) $y = 48.7 + 11.8x$
 c) \$ 74.66
 d) 0.804
 e) 64.7%
 f) Positive and high

b)



2. a) $y = 4.70 - 0.84x$
 c) 3.02 books
 d) -0.725
 e) 52.5%
 f) Negative and moderate

b)



3. a) $y = 3.16 + 1.52x$
 c) 21.5
 d) 0.815
 e) 66.5%
 f) Positive and high

b)

