Correlation and Regression

Chapters 4-5

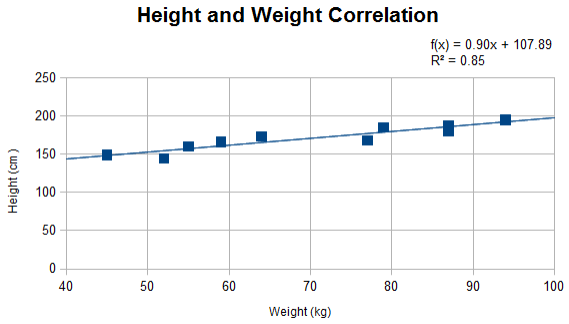
Problem 1

An educator calculates a least squares regression line to predict the expected grade in chemistry from his grade in mathematics: $\widehat{y} = 1.7 + 0.68x$. One student in the class had 7 points in math and 8.5 points in chemistry.

a) What is the residual of this student's grade in chemistry?

b) Identify the values of the slope and intercept. Explain what the slope of this least squares regression line tells us with regard to the explanatory and response variables.

Problem 2



A researcher calculates a least squares regression line to predict height from weight: $\widehat{y} = 107.89 + 0.9x$. What is the predicted value of height for a weight value of 118 kg? Explain why your prediction is not accurate.

Problem 3

We consider the data weekly reports on the box office ticket sales in $ for plays on Broadway in New York. A scatterplot reveals a linear relationship. In parts (a) through (d), use the summary statistics below to find the least-squares regression line equation to predict the gross box office results for the current week from the gross box office results for the previous week.

Variable	Mean	Standard deviation
the gross box office results for the current week	617843	297813
the gross box office results for the previous week	622187	302724
The correlation is r = 0.998		

a) Write the equation for the least squares regression line.

b) Calculate r^2. Explain specifically what r^2 means in terms of the explanatory and response variables.

Problem 4

Explain what is the correlation (no formulas needed). When you can use it? How you can interpret it (facts about correlation)?