

UNIVERSITY OF TEXAS AT AUSTIN

Quiz # 3
Correlation.

Provide your final answer only to the following questions.

Problem 3.1. (2 points)

The income of the members of the Screen Actors' Guild (SAG) range from several thousand dollars per year to many millions per year. Suppose a histogram is made of all of the last year's income of SAG members. One would expect for this histogram to be **skewed to the right**. *True or false?*

Solution: TRUE

The wealth distribution is skewed to the right, as the mean is larger than the median, i.e., more than half working actors have less than the average level of income.

Problem 3.2. (2 points) The following statement makes sense:

The correlation between nationality and personal wealth is -0.89 .

True or false?

Solution: FALSE

Problem 3.3. (2 points) The correlation coefficient equals the proportion of times that two variables lie on a straight line.

True or false?

Solution: FALSE

Problem 3.4. (2 points) If r is the sample correlation between x and y , then $2r$ is the correlation between $2x$ and y .

True or false?

Solution: FALSE

Problem 3.5. (2 points) A college newspaper interviews a psychologist about a proposed system for rating the teaching ability of faculty members. The psychologist says, The evidence indicates that the correlation between a faculty members research productivity and teaching rating is close to zero. The correct interpretation of this statement is:

Good researchers are just as likely to be good teachers as they are bad teachers. Likewise for poor researchers.

True or false?

Solution: TRUE

Provide your complete solutions for the following problems.

Problem 3.6. (5 points) Which of the following is a valid statement?

- The correlation between students' majors and their GPA is 0.67.
- The correlation between students' IQ scores and their foot size is 0.67.
- The correlation between students' incomes and their GPA is 1.12.

Explain!

Solution: Only **b.** In **a.** the students' majors are a categorical variable and so the correlation coefficient is not well-defined. In **c.**, the value of the correlation coefficient exceeds 1.