Correlation and Covariance

Questions

PW SKILLS

Correlation and Covariance

Q1. Define Covariance and explain how it differs from Correlation in terms of scale and interpretation.

Q2. What does a positive, negative, and zero covariance indicate about the relationship between two variables?

Q3. Discuss the limitations of covariance as a measure of relationship between two variables. Why is correlation preferred in many cases?

Q4. Explain the difference between Pearson's correlation coefficient and Spearman's rank correlation coefficient. When would you prefer to use Spearman's correlation?

Q5. If the correlation coefficient between two variables *X* and *Y* is 0.85, interpret this value in context. Can you infer causation from this value? Why or why not?

Q6. Using the dataset below, calculate the covariance between *X* and *Y*.

X	2	4	6	8
Y	3	7	5	10

Q7. Compute the Pearson correlation coefficient between variables A and B:

A	10	20	30	40	50
B	8	14	18	24	28

Q8. The following table shows heights (in cm) and weights (in kg) of 5 students.
Find the correlation coefficient between Height and Weight.

Height	150	160	165	170	180
Weight	50	55	58	62	70

Q9. Given the dataset below, determine whether there is a positive or negative correlation between X and Y. (No need for exact calculation, just reasoning.)

X	1	2	3	4	5
Y	15	12	9	7	3

Q10. Two investment portfolios have the following returns (%) over 5 years. Compute the covariance and correlation coefficient, and interpret whether the portfolios move together.

Year	Portfolio A	Portfolio B
1	8	6
2	10	9
3	12	11
4	9	8
5	11	10