ECONOMICS

BOOKS - GOYAL BROTHERS PRAKASHAN ECONOMICS (HINGLISH)

CORRELATION

Example

1. Calculate the coefficient of correlation between price of a good and its demand by

direct method.

Price (₹)	7	6	5	4	3	2	1
Demand (units)	10	12	15	20	30	40	50

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2. Calculate coefficient of correlation between demand for a good and its price.

Demand	10	15	25	40	50
Price	1	2	3	4	6

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Solved Examples

1. Calculate coefficient of correlation between marks in Mathematics and marks in Economics obtained by 10 students.

S.No.	Marks in Mathematics	Marks in Economics
1	20	18
2	5	10
3	15	15
4	12	11
5	18	16
6	4	8
7	8	9
8	14	15
9	9	10
10	0	5

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2. Calculate coeffcient of correlation between marks in Mathematics and marks in Economics

obtained by 10 students.

S.No.	Marks in Mathematics	Marks in Economics
1	20	18
2	5	10
3	15	15
4	12	11
5	18	16
6	4	8
7	8	9
8	14	15
9	9	10
10	0	5

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3. Calculate coorelation coefficient between X series and Y series.

X	10	8	5	11	7	4	2
Y	5	9	4	14	0	5	3

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4. Calculate the coefficient of correlation between the two series :

X	1	2	3	4	5	6
Y	2	4	6	8	10	12

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5. Calculate the coeficient of correlation between X and Y.

X	1	2	3	4	5
Y	3	3	3	3	3

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6. Calculate rank correlation coefficient of Example 1 in Section 11.4.

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7. Calculate rank correlation coefficient from the data in Example 2 in Section 11.4

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8. Calculate rank correlation coefficient from data in Example 3 in Section 11.4.

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9. Calculate rank correlation coefficient from data in Example 4 in Section 11.4

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Multiple Choice Questions

1. Spot the correct statement about simple correlation and partial correlation :

A. Both study relation between only two variables.

B. Both establish cause and effect relationship.

C. Simple correlation takes into consideration other variables,

D. Partial correlation confines to only two variables.

Answer: A

2. When x falls, y also falls. There is perfect correlation between the two. The correlation coefficient between the two is

    A. Zero

    B. Infinity

    C. $+1$

    D. -1

Answer: C

3. Correlation between two variables is

    A. Proof of relationship between two variables.

    B. Simply some pointer of relationship between two variables.

    C. Neither (a) nor (b)

D. Either (a) or (b)

Answer: B

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Short Answer Questions I

1. Distinguish between positive and negative correlations.

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2. Distinguish between simple and multiple correlations.

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Short Answer Questions Ii

1. Explain the importance of scatter diagram in the study of correlation.

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1. Calculate coefficient of correlation between series X and Y.

X	10	8	6	4	2
Y	2	4	6	8	10

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2. Calculate coefficient of correlation between series A and B.

A	1	2	3	4	5	6	7
B	4	4	4	4	4	4	4

3. Calculate coefficient of correlation between age of wives and age of husbands.

Age of wives	20	21	19	25	24
Age of husbands	24	24	21	30	24

4. Calculate coefficient of correlation between prices and quantity supplied at each price.

Price (₹)	1	2	3	4	5
Supply (units)	10	12	14	20	25

5. Calculate rank correlation from data given in

Q. No. 1

6. Calculate rank correlation from data given in

Q. No. 2.

7. Calculate rank correlation from data given in

Q. No. 3.

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8. Calculate rank correlation from data given in

Q. No. 4.

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9. Calculate coefficient of correlation between Happiness Score and total number of medals (Gold+ Silver+ Bronze) won by the top 10 winner countries in Rio (Brazil) Olympics 2016.

Country	Happiness Score * (out of max. 10)	Total No. of medals won
USA	7.119	119
Great Britain	6.867	66
China	5.140	70
Russia	5.716	56
Germany	6.750	42
Japan	5.987	41
France	6.575	40
South Korea	5.984	21
Italy	5.948	28
Australia	7.284	29

World Happiness Report (2015) : New York : Sustainable Development Solution Network.

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10. Calculate Coefficient of correlation between PPP Gross National Income (GNI) per capita and total number of medals (Gold + Silver + Bronze) won by 10 winner countries in Rio (Brazil) Olympics 2016.

Country	PPP GNI ✳ per capita (2013) (thousand dollars)	Total No. of medals won
USA	52.3	119
Great Britain	35.0	66
China	11.5	70
Russia	22.6	56
Germany	43.0	42
Japan	36.7	41
France	36.6	40
South Korea	30.3	21
Italy	32.7	28
Australia	41.5	29

Human Development Report 2014.

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1. Which of the following techniques deals with the association between two or more variables?

A. (a) Index number

B. (b) Correlation

C. (c) Dispersion

D. (d) None of the above

Answer: B

2. When two variables move together in the same direction, it is said to be

    A. (a) no correlation

    B. (b) negative correlation

    C. (c) positive correlation

    D. (d) zero correlation

Answer: C

3. Correlation is an analysis of .... between two or more variables.

A. (a) Relationship

B. (b) covariation

C. (c) determination

D. (d) calculation

Answer: B

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4. .... is a graphical method of studying correlation.

A. (a) Histogram

B. (b) Bar diagram

C. (c) Scatter diagram

D. (d) Circle diagram

Answer: C

5. If the scatter points are widely dispersed around the line, the correlation is

A. (a) high

B. (b) low

C. (c) moderate

D. (d) None of the above

Answer: B

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6. If all the points lie on the same downward sloping line, the correlation is said to be

A. (a) perfect correlation

B. (b) perfect positive correlation

C. (c) perfect negative correlation

D. (d) negative correlation

Answer: C

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7. To construct a scatter diagram, independent variable is taken on ....

A. (a) X-axis

B. (b) Y-axis

C. (c) Either X-axis or Y-axis

D. (d) None of the above

Answer: A

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8. Movement of points from left to right, in an upward direction indicates

A. (a) negative correlation

B. (b) positive correlation

C. (c) no correlation

D. (d) None of the above

Answer: B

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9. If r is positive, then the two variables move in the ……….direction.

    A. (a) opposite

    B. (b) same

    C. (c) upward

    D. (d) None of these

Answer: B

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10. Karl Pearson's coefficient of correlation indicates the .... and also the degree of relationship between the two variables.

A. (a) direction

B. (b) relation

C. (c) interpretation

D. (d) None of the above

Answer: A

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11. The coefficient of correlation is independent of

    A. (a) change of scale only

    B. (b) change of origin only

    C. (c) both change of scale and origin

    D. (d) None of the above

Answer: C

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12. When the mean of series is a decimal number, then which method should be used for computing Karl Pearson's coefficient of correlation?

    A. (a) Direct Method

    B. (b) Shot-cut Method

    C. (c) Step Deviation Method

    D. (d) None of the above

Answer: B

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13. Rank correlation is a superior method of analysis in case of .... distributions such as those relating to virtue, wisdom or ignorance.

A. (a) quantitative

B. (b) qualitative

C. (c) data

D. (d) None of the above

Answer: B

14. Rank correlation method was developed by

A. (a) Charles Edward Spearman

B. (b) Karl Pearson's

C. (c) JB Say

D. (d) None of the above

Answer: A

15. A modified version of Karl Pearson's formula is

A. (a) $'r = frac\{Sigmaxy\}\{Sigma \ x^2.Sigma \ y^2\}'$

B. (b) $'r = frac\{Sigmaxy\} \ sqrt\{Sigma \ x^2 times \ Sigma \ y^2\}'$

C. (c) $'r = frac\{Sigma \ xy\} \ \{n \ Sigma \ X^2 \ . \ Sigma \ Y^2\}'$

D. (d) 'r = frac{Sigma xy} {n sigma x . sigma y}'

Answer: B

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