

Type-I Correlation

1. Obtain the rank correlation coefficient from the following data.

X :	10, 12, 18, 18, 15, 40
Y :	12, 18, 25, 25, 50, 25

2. Calculate the correlation coefficient from the following data.

X : 23, 27, 28, 29, 30, 31, 33, 35, 36, 39.

Y : 18, 22, 23, 24, 25, 26, 28, 29, 30, 32.

3. Find the coefficient of correlation between x and y for the following data.

x : 62 64 65 69 70 71 72 74

y : 126 125 139 145 165 152 180 208

4. For the following data, show that $cov(x, x^2) = 0$.

x : -3, -2, -1, 0, 1, 2, 3

x^2 : 9, 4, 1, 0, 1, 4, 9

5. Find the coefficient of correlation 'r' between the heights of fathers (x) and of sons (y) from the following data

x : 65, 66, 67, 68, 69, 70, 71, 67.

y : 67, 68, 64, 72, 70, 67, 70, 68.

6. Compute Spearman's rank correlation coefficient from the following data.

X : 18, 20, 34, 52, 12 Y : 39, 23, 35, 18, 46.

7. Calculate the coefficient of correlation from the data: $N = 10$,

$$\sum x = 100, \sum y = 150, \sum (x - 10)^2 = 180, \sum (y - 15)^2 = 215, \sum (x - 10)(y - 15) = 60.$$

Where x, y denote the actual values.

8. A sample of 25 pairs of values of x and y lead to the following results.

$$\sum x = 127, \sum y = 100, \sum x^2 = 760, \sum y^2 = 449, \sum xy = 500.$$

Later on it was found that two pairs of values were taken as (8, 14) and (8, 6) instead of correct values (8, 12) and (6, 8). Find corrected correlation coefficient between x and y .

Type-II Regression

1. The following table gives the age of car of a certain make and annual maintenance cost.

Obtain the equation of the line of regression of cost on age.

Age of a car : 2 4 6 8

Maintenance : 1 2 2.5 3

2. Obtain the equation of the line of regression of y on x from the following data and estimate y for $x = 73$.

x : 70 72 74 76 78 80

y : 163 170 179 188 196 220

3. Find (i) The lines of regression, (ii) Coefficient of correlation for the following data.

x : 65 66 67 67 68 69 70 72

y : 67 68 65 66 72 72 69 71

4. Find the equations of lines of regression for the following data.

x : 5 6 7 8 9 10 11

y : 11 14 14 15 12 17 16 Also find r.

5. From 8 observations the following results were obtained :

$\sum x = 59$, $\sum y = 40$, $\sum x^2 = 524$, $\sum y^2 = 256$, $\sum xy = 364$. Find the equation of the line of regression of x on y and the coefficient of correlation.

6. The following calculations have been made for closing prices of 12 stocks (X) on the Mumbai Stock Exchange on a certain day, along with the volume of sales in thousands of shares (Y). From these calculations find the regression equations,

$\sum X = 580$, $\sum Y = 370$, $\sum XY = 11,494$, $\sum X^2 = 41,658$, $\sum Y^2 = 17,205$.

7. Given	x series	y series	
Mean	18	100	
S. D.	14	20	$r = 0.8.$

Find the most probable value of y when $x = 70$ and most probable value of x when $y = 90$.

8. You are supplied with the following information. The equation of the lines regression are

$2x + 3y + 8 = 0$ and $x + 2y - 5 = 0$. Find the means of x and y, the coefficient of correlation between them.

9. The equations of the two regression lines are $3x + 2y = 26$ and $6x + y = 31$.

Find **(i)** The means of x and y and **(ii)** Coefficient of correlation between x and y.

10. Find the angle between the lines of regression using the following data.

$n=10, \sum x = 270, \sum y = 630, \sigma_x = 4, \sigma_y = 5, r_{xy} = 0.6.$