

SCATTERED DIAGRAM AND LINE OF REGRESSION

PRESENTATION BY
PROF.(DR.) SANJAY KUMAR
(PROFESSOR AND HOD)
P.G. DEPARTMENT OF GEOGRAPHY
MAHARAJA COLLEGE, ARA

SCATTERED DIAGRAM AND LINE OF REGRESSION

- A scatter diagram uses dots to plot two numerical variables against each other, and a line of regression is the "best-fit" straight line drawn through those points to represent the relationship between them. The scatter plot visually shows the correlation, while the line of regression provides a mathematical model for prediction and trend analysis.

SCATTERED DIAGRAM AND LINE OF REGRESSION

- Scatter diagram

← SCATTERED DIAGRA...



- Scatter diagram
- A graph that displays values for two different variables as a collection of points.
- The independent variable (X) is placed on the horizontal axis, and the dependent variable (Y) is placed on the vertical axis. Each dot on the graph represents a single pair of data points.
- The pattern of the dots reveals the relationship between the two variables, such as positive (points trend upward), negative (points trend downward), or no correlation (points are scattered randomly).

SCATTERED DIAGRAM AND LINE OF REGRESSION

- Line of regression-
- A straight line that best fits the data points on a scatter plot.
- It represents the central trend in the data and is used to generalize common characteristics or to predict values.
- The line is calculated using a statistical method called [linear regression](#) to minimize the distance between the line and all the data points.

SCATTERED DIAGRAM AND LINE OF REGRESSION

• Q.

X	Y	Line of regression
1	10	
2	15	
3	20	
4	25	
5	30	
6	35	
7	40	
8	45	
9	50	
10	55	

← SCATTERED DIAGRA...



- Q.

The following table shows the marks scored by 10 students in two subjects, English and Hindi. The marks are given in the following table. Draw a scatter diagram and find the line of regression.

Student	English	Hindi
1	75	70
2	70	65
3	72	68
4	78	72
5	80	75
6	82	78
7	85	80
8	88	82
9	90	85
10	92	88

Calculation of regression line:

$$b = \frac{\sum xy - \frac{\sum x \sum y}{n}}{\sum x^2 - \frac{(\sum x)^2}{n}}$$

$$b = \frac{663 - \frac{720 \times 770}{10}}{278 - \frac{720^2}{10}}$$

$$b = \frac{663 - 5544}{278 - 5184}$$

$$b = \frac{-4881}{-4906} = 0.9949$$

$$a = \frac{\sum y - b \sum x}{n} = \frac{770 - 0.9949 \times 720}{10} = \frac{770 - 716.328}{10} = \frac{53.672}{10} = 5.3672$$

$$\therefore \text{Line of regression is } y = 0.9949x + 5.3672$$

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$$y = a + bx$$

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$$\therefore b = 0.9949$$

$$a = 5.3672$$

$$y = a + bx$$

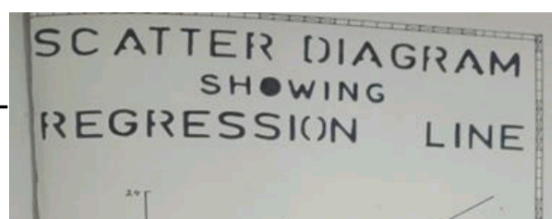
$$y = 5.3672 + 0.9949x$$

$$\text{For } x = 6, y = 5.3672 + 0.9949 \times 6 = 5.3672 + 5.9694 = 11.3366$$

$$\text{For } x = 10, y = 5.3672 + 0.9949 \times 10 = 5.3672 + 9.949 = 15.3162$$

SCATTERED DIAGRAM AND LINE OF REGRESSION

Graph-



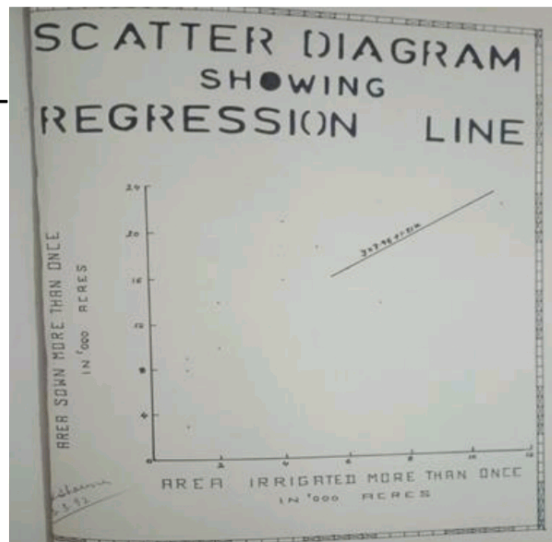
← SCATTERED DIAGRA...



$$\begin{aligned} \sum x &= 100 \\ \sum y &= 100 \\ \sum xy &= 100 \\ \sum x^2 &= 100 \\ \sum y^2 &= 100 \end{aligned}$$

SCATTERED DIAGRAM AND LINE OF REGRESSION

Graph-



SCATTERED DIAGRAM AND LINE OF REGRESSION

• **THE END**

• **THANK YOU**



• **HAVE A NICE DAY.**