Semester : IV Subject : Statistics for AIDS Academic Year: 2023-2024

LINEAR REGRESSION:

What is regression?

Regression is used to find the relationship between variables.

What is Linear Regression?

Linear regression gives you the relation between dependent variable and independent variable.

Equation of Linear Regression : $Y = mx + b$

* Y represents the dependent variable.
* X represents the independent variable.
* m is the slope of line (how much Y changes for a unit change in X).
* b is the intercept (the value of Y when X is 0).

Example:-

Project: Predicting Pizza Prizes.

Step 1: Data Collection.

Step 2: Calculations.

Step 3: Predictions.

Step 4: Visualization

Semester : 4 Subject : Statistics for AI/DS Academic Year: 2023-2024

Diameter in Inches X	Price (Y) in Dollars	Mean (X) $\bar{X}$	Mean (Y) $\bar{Y}$	Deviation (X) $X-\bar{X}$	Deviation (Y)	Product of Deviation	Sum of Product of Dev.	Square of Deviation for X
8	10	10	13	-2	-3	6	12	4
10	13			0	0	0		0
12	16			2	3	6		4

$$Y = mX + b$$

Calculate m = Sum of product of deviations / Sum of square of deviation for X.

$= 12/8$

$$m = 1.5$$

Calculate b = Mean of Y − (m × mean of X)

$= 13 - (1.5 \times 10)$

$= 13 - 15 = -2$.

$$b = -2$$

$Y = mX + b$.

$= (1.5)(8) + (-2)$

$= 10$.

$(X = 20)$ $Y = (1.5)(20) + (-2)$

$= 28$.