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Linear regression equation

Linear regression

Relation of dependent and independent then do predictions on basis of it.

Equation

$$Y = mX + b$$

Y = dependent variable (numbers) (How many numbers will get on basis of X)
X = independent variable (hours of study)
m = slop of line (how much Y changes for 1 unit change in X)
b = intercept (value of Y when X is 0.)

Predicting Pizza prices

Step 1 : Data collection.
Step 2 : Calculations.
Step 3 : Prediction.
Step 4 : Visualization.

(X)	(Y)	Mean(X)	Mean(Y)	Deviation(X)	Deviation (Y)
8	10	$\frac{\sum X}{n}$	$\frac{\sum Y}{n}$	(X) − Mean(X)	(Y) − Mean(Y)
10	13				

Product of deviations

Deviation (x) x Deviation (Y)

Sum of products of deviations

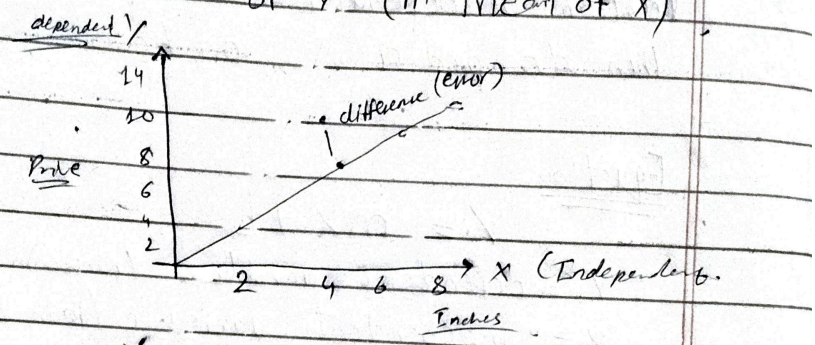
All add products of deviations

Square of deviation for (X)

$(\text{Deviation (x)})^2$

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

b = Means of Y − (m* Mean of X)



$Y = mX + b$.

If data is scattered

If prediction is change from actual (outliers) are error. (we try to reduce).

Diameter(X) In Inches	Price(Y) In Dollars	Mean(X)	Mean(Y)	Deviations(X)	Deviations(Y)	Product of Deviations	Sum of Product of Deviations	Square of Deviations for X
8	10	10	13	-2	-3	6	12	4
10	13			0	0	0		0
12	16			2	3	6		4

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

Calculate b = Mean of Y - (m * Mean of X)