



Semester : VI

Subject : Machine Learning

Academic Year: 2023 - 2024

Least Square Method

Example:-

Tom who is the owner of a retail shop, found the price of different T-shirts is the number T-shirts sold at his shop over a period of one week

- Let us use the concept of least squares regression to find the line of best fit for the below data.

Step 1:- Calculate the slope 'm' x axis by using the following formula

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

$$m = \frac{5(263) - (26)(41)}{5 \times (168) - (26)^2}$$

$$= \frac{1315 - 1066}{840 - 676} = \frac{249}{164}$$

$$m = 1.518 \text{ approximately}$$

Price of T-shirt in dollars (x)	No. of T-shirt sold (y)
2	4
3	5
5	7
7	10
9	15

Step 2:- Compute the y-intercept value ($m=1.518$)

$$C = y - mx$$

$$C = (\text{mean of } y) - m(\text{mean of } x)$$

$$= 8.2 - (1.518)(5.2)$$

$$C = 0.305 \text{ approximat}$$



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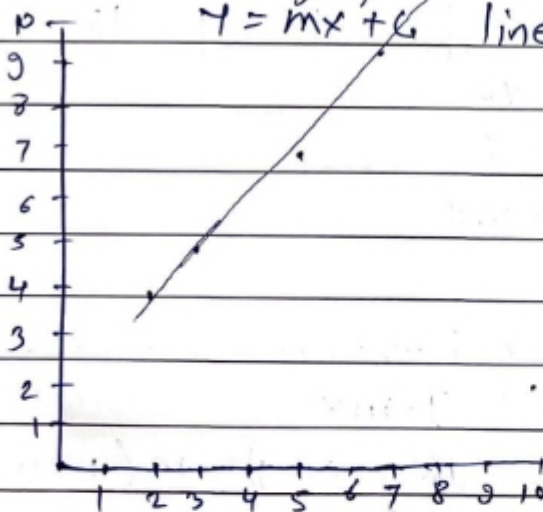
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Step 3:- Substitute the values in final equation
 $y = mx + c$

Once you substitute the value, it should look
Something like this)

Price of T-shirt in (x)	No. of T-shirt sold (y)	$y = mx + c$	error
2	4	3.3	-0.67
3	5	4.9	-0.14
5	7	7.9	0.89
7	10	10.9	0.93
9	15	13.9	-1.03

Lets construct a graph that represent the
 $y = mx + c$ line of best fit



Now Tom can use the above equation to estimate
how many T-shirts of price \$8 can be sell at
the retail shop

$$y = 1.518 \times 8 + 0.305 = 12.45 \text{ T-shirts}$$

• This come down to 13 T-shirts!