Linear Regression

Scenario:

A Company is trying to understand the relationship between the number of Years of Experience it's Employees have and their Corresponding Salaries. By analyzing this relation Ship, the Company hopes to be able to predict the Salary of new hires based on their Years of Experience.

Data: of 15 Employees, Showing their Years of Experience and their Current Salary.

Years of Experience	Salary ($)
1.1	39,343
1.3	46,205
1.5	37,731
2.0	43,525
2.2	39,891
2.9	56,642
3.0	60,150
3.2	60,150
3.7	54,445

Task: Predict a Salary: Once you have your linear regression model, use it to Predict the Salary for a new Employee with 5.0 Years of Experience.

1.5	37,731

Mean of (X)	Mean of (Y)	Dev of (X)	Dev of (Y)	Product of Deviation	Sum of Prodct of Deviation	Square of Dev of (x)
2.32	48,675	+1.22	~~+48,675~~ +9,332	11,885	56,063	1.4884
		+1.02	+2,470	2,519		1.0404
		+0.82	+10,944	8,974		0.6724
		+0.32	+5,150	1,648		0.1024
		+0.12	+8,784	1,054		0.0144
		0.58	7,967	4,620		0.3364
		0.68	11,475	7,803		0.4624
		0.88	11,475	10,098		0.7744
		1.38	5,770	7,962		1.9044
						6.7916

M = Sum of Product of Deviation / Sum of Square of Dev(x)

= 56,063 / 6.7916

M = 8,254.75 => M

b = mean(Y) − (M * mean of (X))

= 48,675 − (8,254.75 * 2.32)

= 48,675 − 19,151

b = 29,524 => b

Y = M·X + b

Q = Predict Salary (Y) with the Experiance 5.0 (X)

* = 5.0

Salary = 8254.75 * 5.0 + 29,524

Salary => 70,797.75