

This page shows how to calculate the regression line for our example using the least amount of calculation.

First form the following table:

x	x ²	y	y ²	x y
5	25	6	36	30
1	1	0	0	0
10	100	8	64	80
4	16	6	36	24
20	142	20	136	134

[The last row represents the column totals.] We see that $\bar{x} = 20 / 4 = 5.0$, and $\bar{y} = 20 / 4 = 5.0$.

The variance of x (= (the standard deviation of x)²) is $S_x^2 = (\sum x^2 - n \bar{x}^2) / (n - 1)$ or

$$S_x^2 = (142 - 4 * 5.0^2) / (4 - 1) = 42 / 3 = 14.$$

The covariance is $S_{xy} = (\sum xy - n \bar{x} \bar{y}) / (n - 1)$ or

$$S_{xy} = (134 - 4 * 5.0 * 5.0) / (n - 1) = 34 / 3 = 11.33.$$

The slope of the regression line is $b_1 = S_{xy} / S_x^2$, or $b_1 = 11.33 / 14 = 0.809$.

The intercept is $b_0 = \bar{y} - b_1 \bar{x}$, or $b_0 = 5.00 - .809 * 5.00 = 0.95$

Thus the equation of the least squares line is $\hat{y} = 0.95 + 0.809 x$.