Linear regression

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1 C:=Sum((el(Y,k)-(a+b*el(X,k)))^2,k):
2 ans:=solve({diff(C,a),diff(C,b)},{b,a}):
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$$\begin{bmatrix} b \\ a \end{bmatrix} := ans = \begin{bmatrix} \dfrac{-Sum\left(X_k, k\right)\cdot Sum\left(Y_k, k\right)+Sum\left(1, k\right)\cdot Sum\left(X_k\cdot Y_k, k\right)}{-Sum\left(X_k, k\right)^2+Sum\left(1, k\right)\cdot Sum\left(X_k{}^2, k\right)} \\ -\dfrac{Sum\left(X_k\cdot Y_k, k\right)\cdot Sum\left(X_k, k\right)-Sum\left(X_k{}^2, k\right)\cdot Sum\left(Y_k, k\right)}{-Sum\left(X_k, k\right)^2+Sum\left(1, k\right)\cdot Sum\left(X_k{}^2, k\right)} \end{bmatrix}$$

For showing the formula

$$Sum\left(x, k\right) := \begin{cases} \text{if } num2str\left(x\right) = \text{"1"} \\ \quad n \\ \text{else} \\ \quad \Sigma\left(equrep\left(x, a_k, a\right)\right) \end{cases}$$

$$a = -\frac{-\Sigma\left(Y\right)\cdot\Sigma\left(X^2\right)+\Sigma\left(X\right)\cdot\Sigma\left(X\cdot Y\right)}{n\cdot\Sigma\left(X^2\right)-\Sigma\left(X\right)^2}$$

$$b = \frac{n\cdot\Sigma\left(X\cdot Y\right)-\Sigma\left(X\right)\cdot\Sigma\left(Y\right)}{n\cdot\Sigma\left(X^2\right)-\Sigma\left(X\right)^2}$$

For a numerical application

$$Sum\left(x, k\right) := \sum_{k=1}^{n} x$$

$X := stack\left(2, 7, 9, 12, 20\right)$

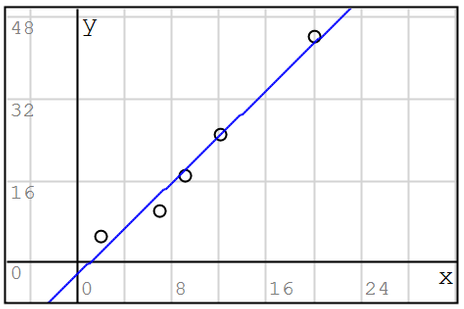
$Y := stack\left(5, 10, 17, 25, 44\right)$

$n := length\left(X\right)$

$$\begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} -2.4404 \\ 2.264 \end{bmatrix}$$

$$a = -\frac{1413\cdot 50-678\cdot 101}{-50^2+5\cdot 678}$$

$$b = \frac{-50\cdot 101+5\cdot 1413}{-50^2+5\cdot 678}$$



$a + b\cdot x$
$augment\left(X, Y, \text{"o"}\right)$

Alvaro

$appVersion\left(4\right) = \text{"1.0.8348.30405"}$