

# Linear regression

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Now perform matrix manipulations to isolate (solve for)  $m$  and  $b$ .

$$\mathbf{y} = [\mathbf{x} \quad \mathbf{1}] \begin{bmatrix} m \\ b \end{bmatrix}$$

$$[\mathbf{x} \quad \mathbf{1}]^T \mathbf{y} = [\mathbf{x} \quad \mathbf{1}]^T [\mathbf{x} \quad \mathbf{1}] \begin{bmatrix} m \\ b \end{bmatrix}$$

$$\left( [\mathbf{x} \quad \mathbf{1}]^T [\mathbf{x} \quad \mathbf{1}] \right)^{-1} [\mathbf{x} \quad \mathbf{1}]^T \mathbf{y} = \begin{bmatrix} m \\ b \end{bmatrix}$$

This is the least squares solution.