

$$y = w_1 x_1 + w_2 x_2 + w_3 x_3 + \dots + w_n x_n + b$$

	x_1	x_2	x_3	y
1	2	4	8	
2	3	0	7	
3	2	1	5	

$$w = (X^T X)^{-1} \cdot X^T y$$

$$y = \begin{bmatrix} 8 \\ 7 \\ 5 \end{bmatrix}$$

$$X \cdot X^T = \begin{bmatrix} 22 & 9 & 12 \\ 9 & 14 & 13 \\ 12 & 13 & 15 \end{bmatrix} \Rightarrow (X^T X)^{-1}$$

$$X = \begin{bmatrix} 1 & 2 & 4 \\ 1 & 3 & 0 \\ 1 & 2 & 1 \end{bmatrix}$$

$$X^T = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 3 & 2 \\ 4 & 0 & 1 \end{bmatrix}$$

$$X^T y = \begin{bmatrix} 30 \\ 37 \\ 37 \end{bmatrix}$$

$$(X^T X)^{-1} \cdot X^T y = \begin{bmatrix} b \\ w_1 \\ w_2 \\ w_3 \end{bmatrix}$$

↓ Column = bias
 1 col before rest bias
 as default

$X^T = row \leftrightarrow Column$