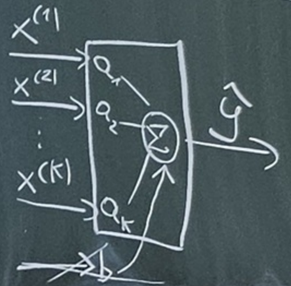
$$\hat{a} = \frac{\sum_{i=1}^{N}(x_i-\bar{x})(y_i-\bar{y})}{\sum_{i=1}^{N}(x_i-\bar{x})^2}$$

$$\hat{b} = \bar{y} - \hat{a}\bar{x}$$

$$\hat{y} = \tilde{\Theta}^T x = \sum_{j=1}^{K} a_j x^{(j)}$$



x_i – j)-nr cechy, $\{(x_i, y_i)\}_{i=1}^{N}$

i – nr obserw

$$\tilde{\Theta} = \begin{bmatrix} a_1 \\ \vdots \\ a_K \end{bmatrix}$$

x	2	1	-3
y	3	1	-2

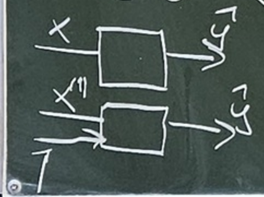
$\hat{y} = \tilde{\Theta} x$? $+b$

$x^{(1)}$	2	1	-3
$x^{(2)}$	1	1	1
y	3	1	-2

y_i

$$\hat{y} = ax + b\,1$$

$$\hat{y} = a_1 x^{(1)} + a_2 x^{(2)}$$



$$\hat{y} = ax^2 + bx + c$$

$x^{(1)}$	4	1	9
$x^{(2)}$	2	1	-3
$x^{(3)}$	1	1	1
y	3	1	-2

X

$$X = [x_1 \; x_2 \; \cdots \; x_N] \quad K \times N$$

$$Y = [y_1 \; y_2 \; \cdots \; y_N] \quad 1 \times N$$

$$X = \begin{bmatrix} x_1^{(1)} & x_2^{(1)} & \cdots & x_N^{(1)} \\ x_1^{(2)} & x_2^{(2)} & \cdots & x_N^{(2)} \\ \vdots & \vdots & & \\ x_1^{(K)} & x_2^{(K)} & \cdots & x_N^{(K)} \end{bmatrix}$$

$$\hat{Y} = [\tilde{\Theta}^T x_1 \; \tilde{\Theta}^T x_2 \; \cdots \; \tilde{\Theta}^T x_N] =$$

$$= \tilde{\Theta}^T [x_1 \; x_2 \; \cdots \; x_N]$$

$$\hat{Y} = \tilde{\Theta}^T X$$

$$Y = \Theta^T X \quad / \cdot X^T$$

$$Y X^T = \Theta^T X X^T \quad / \cdot (X X^T)^{-1}$$

$$Y X^T (X X^T)^{-1} = \Theta^T$$

$$\hat{\Theta} = (X X^T)^{-1} X Y^T$$

$$Y X^{-1} = \Theta^T X X^{-1}$$

$$Y = \Theta^T X \quad / \cdot X^+$$

$$X^T = B$$

$$X^+$$

$K \times N \quad N \times K$

$$(A^T)^T = A$$

$$(A \pm B)^T = A^T \pm B^T$$

$$(A \cdot B)^T = B^T A^T$$

$$(A^T)^{-1} = (A^{-1})^T$$

$$(A \cdot B)^{-1} = B^{-1} A^{-1}$$

$$(A+B)^{-1} = ?!$$

$$\frac{1}{A+B} = \frac{1}{A} + \frac{1}{B}$$

$$\hat{\Theta} = G Y^T$$

$$\hat{\Theta} = (X X^T)^{-1} X Y^T$$

$$\det(X X^T) \neq 0$$

$$Y = \Theta^T X$$

Zat. dane układ. się w linię

$$\hat{Y} = \Theta^T X$$