9 = Wo + W, x, + ... + Wpxp

$$\overline{y} = X \widehat{w} + \varepsilon$$

$$\begin{bmatrix}
y_1 \\
y_2 \\
\vdots \\
y_n
\end{bmatrix}$$

$$X = \begin{bmatrix} \overline{\chi}_1^T \\ \overline{\chi}_2^T \\ \vdots \\ \overline{\chi}_{w}^T \end{bmatrix}$$

$$\overline{y} = \begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_n \end{bmatrix} \qquad X = \begin{bmatrix} \overline{\chi}_1^T \\ \overline{\chi}_2^T \\ \vdots \\ \overline{\chi}_{N}^T \end{bmatrix} \qquad \begin{bmatrix} \chi_{11} & \chi_{12} & \dots & \chi_{1p} \\ \chi_{21} & \chi_{22} & \dots & \vdots \\ \vdots & \ddots & \ddots & \ddots \\ \vdots & \ddots & \ddots & \ddots \\ \vdots & \ddots & \ddots & \ddots \\ X_{Np} \end{bmatrix}$$

$$\tilde{\mathcal{E}} = \begin{bmatrix} w_1 \\ w_2 \\ \vdots \\ w_p \end{bmatrix}$$

$$\tilde{\mathcal{E}} = \begin{bmatrix} \mathcal{E}_1 \\ \mathcal{E}_2 \\ \vdots \\ \mathcal{E}_{N} \end{bmatrix}$$

$$\tilde{\epsilon} = \begin{cases} \epsilon_1 \\ \epsilon_2 \end{cases}$$

$$L(D, \overline{\omega}) = \|\overline{y} - X\overline{\omega}\|^2 = \sum_{i=1}^{\infty} \left(y_i - \sum_{j=1}^{\infty} w_j \right)$$

$$= \left(\overline{q} - X \overline{q} \right)^{T} \left(\overline{q} - X \overline{q} \right)$$

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$$= \left(\overline{q} - X \overline{q} \right)^{T} \left(\overline{q} - X \overline{q} \right)$$

$$= \bar{\mathbf{y}}^{\mathsf{T}} \bar{\mathbf{y}} - \mathbf{y}^{\mathsf{T}} \mathbf{X} \bar{\mathbf{w}} - \bar{\mathbf{w}}^{\mathsf{T}} \mathbf{X}^{\mathsf{T}} \bar{\mathbf{y}} + \bar{\mathbf{w}}^{\mathsf{T}} \mathbf{X}^{\mathsf{T}} \bar{\mathbf{y}}$$

 $\overline{u} \times \overline{x} \times \overline{u} = (x^{T}x)^{1/2}x$

71 ×11 + 72 ×27

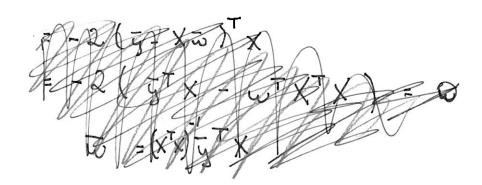
$$\frac{\partial \mathcal{L}}{\partial \overline{w}} = -2 X^{\mathsf{T}} \overline{\mathbf{y}} + 2 X^{\mathsf{T}} X \overline{w} = 0$$

$$\overline{w} = (X^{\mathsf{T}} X)^{\mathsf{T}} X^{\mathsf{T}} \overline{\mathbf{y}}$$

Chain & Rulo

4, 42 - 46 / x, x22

$$\frac{\partial L}{\partial \bar{w}} = (\bar{y} - x\bar{w})^{T} (\bar{y} - x\bar{w})$$



$$= -2 x^{T} (y - x^{T})$$

$$= -2 x^{T} y + 2 x^{T} x^{T} y = 0$$

$$\overline{u} = (x^{T} x)^{-1} x^{T} y$$

+ Propriedades de matrizes transpostas

$$1. \quad (A^T)^T = A$$

2.
$$(A+B)^T = A^T + B^T$$

$$\exists . \ \bar{X}^{\mathsf{T}} A = (A^{\mathsf{T}} \bar{x})^{\mathsf{T}}$$

Little Committee to the committee of the . 74