

Vectorized linear regression:

$$\left. \begin{aligned} z^{(i)} &= W^T x^{(i)} + b \\ a^{(i)} &= \sigma(z^{(i)}) \rightarrow \text{prediction} \end{aligned} \right\} Z = W^T X + B ; \text{ where:}$$

$$W^T = \begin{bmatrix} w_0 & w_1 & \dots & w_{n \times} \end{bmatrix}_{1 \times n \times} ; X = \begin{bmatrix} | & | & & | \\ x^{(1)} & x^{(2)} & \dots & x^{(n)} \\ | & | & & | \end{bmatrix}_{n \times m} ; B = \begin{bmatrix} b_0 \\ b_1 \\ \vdots \\ b_m \end{bmatrix}_{m \times 1}$$

Element-wise product: $A \odot B$ (same shape)

$$A_{m \times n} \odot B_{m \times n} = C_{m \times n}$$