

① $|\vec{\omega}|?$

$$|\vec{\omega}| = \sqrt{0.5^2 + 0.5^2}$$

$$|\vec{\omega}| = 0.7071$$

② $(\vec{x} * \vec{\omega}^T)?$

$$[0.5, 0.5] * \begin{bmatrix} 0.75 \\ 1.25 \end{bmatrix} = [0.5 \cdot 0.75 + 0.5 \cdot 1.25]$$

$$= [1]$$

③ $(\vec{x}^T * \vec{\omega})?$

$$\begin{bmatrix} 0.5 \\ 0.5 \end{bmatrix} * [0.75, 1.25] = \begin{bmatrix} 0.5 \cdot 0.75, 0.5 \cdot 1.25 \\ 0.5 \cdot 0.75, 0.5 \cdot 1.25 \end{bmatrix}$$

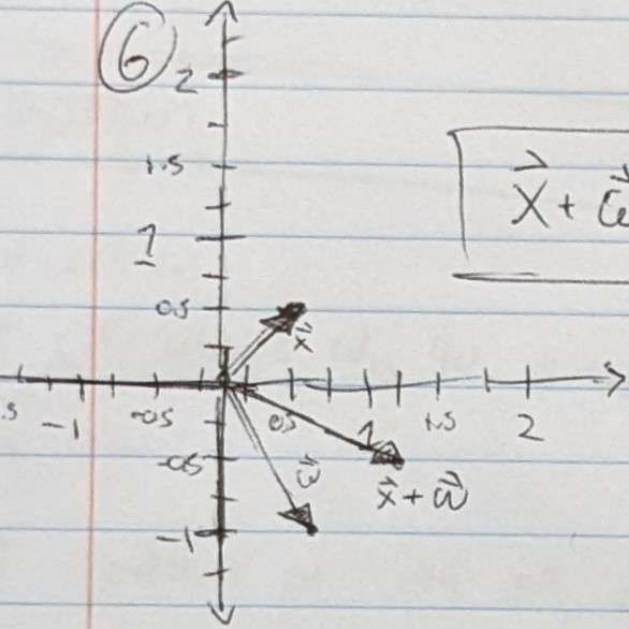
$$= \begin{bmatrix} 0.375 & 0.625 \\ 0.375 & 0.625 \end{bmatrix}$$

④ $\vec{x} \cdot \vec{\omega}?$

$$\begin{bmatrix} 0.5 \\ 0.5 \end{bmatrix} \cdot \begin{bmatrix} 0.75 \\ 1.25 \end{bmatrix} = 0.5 \cdot 0.75 + 0.5 \cdot 1.25$$

$$= 1$$

⑥



$$\vec{x} + \vec{w} = [1.25, -0.5]$$

⑦ Prediction vs. Classification

• Classification is about splitting data into groups based on similar characteristics

↳ sorts data

• Prediction is fitting all of the data to one shape as closely as possible

↳ interpolates missing data

⑧

\vec{x} \vec{y}

x_1	x_2	OR	y_1	y_2	y_3
0	0	0	0 ✓	1 ✗	0 ✓
0	1	1	0	1 ✓	1 ✓
1	0	1	1 ✓	1 ✓	1 ✓
1	1	1	0	1 ✓	1 ✓
			\uparrow_0	\uparrow_1	\uparrow_2
w_0	////		0	0.5	0
w_1	////		0.5	0.75	0.75
w_2	////		-0.5	0.75	-0.25