

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

$$X^{(2)} = [x_0^{(2)}, x_1^{(2)}, x_2^{(2)}]$$

$$W = \begin{bmatrix} a \\ b \\ c \end{bmatrix}$$

$$Y = \begin{bmatrix} 6 \\ 4 \\ 5 \end{bmatrix} = \begin{bmatrix} y^{(1)} \\ y^{(2)} \\ y^{(3)} \end{bmatrix}$$

$$f(x) = ax_0 + bx_1 + cx_2 \quad \text{s.t.} \quad f(x^{(i)}) = y^{(i)}$$

$$X \cdot W = Y$$

*regression as solution of a system of linear equations*

$$\begin{bmatrix} 1 & 2 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 2 \end{bmatrix} \times \begin{bmatrix} a \\ b \\ c \end{bmatrix} = \begin{bmatrix} 6 \\ 4 \\ 5 \end{bmatrix} \begin{cases} 1 \cdot a + 2 \cdot b + 1 \cdot c = 6 \\ 1 \cdot a + 1 \cdot b + 1 \cdot c = 4 \\ 1 \cdot a + 1 \cdot b + 2 \cdot c = 5 \end{cases}$$