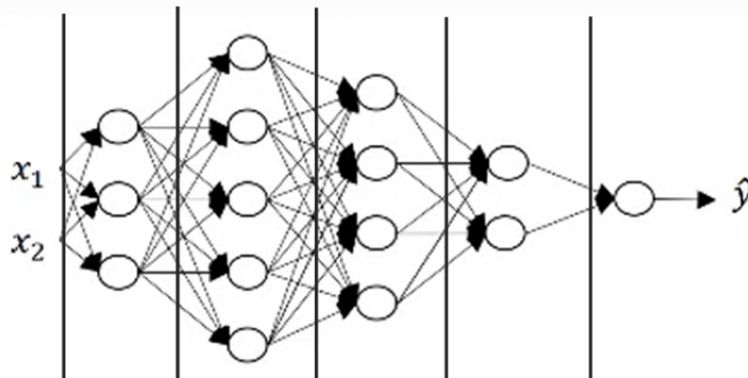


Example:



$$l = [0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5]$$

$$n = \begin{bmatrix} n_x=2 & 3 & 5 & 4 & 2 & 1 \end{bmatrix}$$

*Non-vectorized

$$\textcircled{1} \quad z^{[1]} = w^{[1]} \cdot x + b^{[1]}$$

$$\begin{matrix} (3,1) & (3,2) & (2,1) & (3,1) \\ \downarrow & \downarrow & \downarrow & \downarrow \\ (n^{[1]}, 1) & (n^{[1]}, n^{[0]}) & (n^{[0]}, 1) & (n^{[1]}, 1) \end{matrix}$$

$$w^{[l]} \in \mathbb{R}^{n^{[l]} \times n^{[l-1]}}; b^{[l]} \in \mathbb{R}^{n^{[l]} \times 1}; z^{[l]} \in \mathbb{R}^{n^{[l]} \times 1}; x \in \mathbb{R}^{n_x \times 1}$$

$$a^{[l]} \in \mathbb{R}^{n^{[l]} \times 1}$$

$$dw^{[l]} \in \mathbb{R}^{n^{[l]} \times n^{[l-1]}}; db \in \mathbb{R}^{n^{[l]} \times 1}$$

①

$$z^{[1]} = w^{[1]} \cdot x + b^{[1]}$$

$$(n^{[1]}, m) \quad (n^{[1]}, n^{[0]}) \quad (n^{[0]}, m) \quad (n^{[1]}, 1) \rightarrow \text{gets broadcasted and turns into } (n^{[1]}, m)$$