

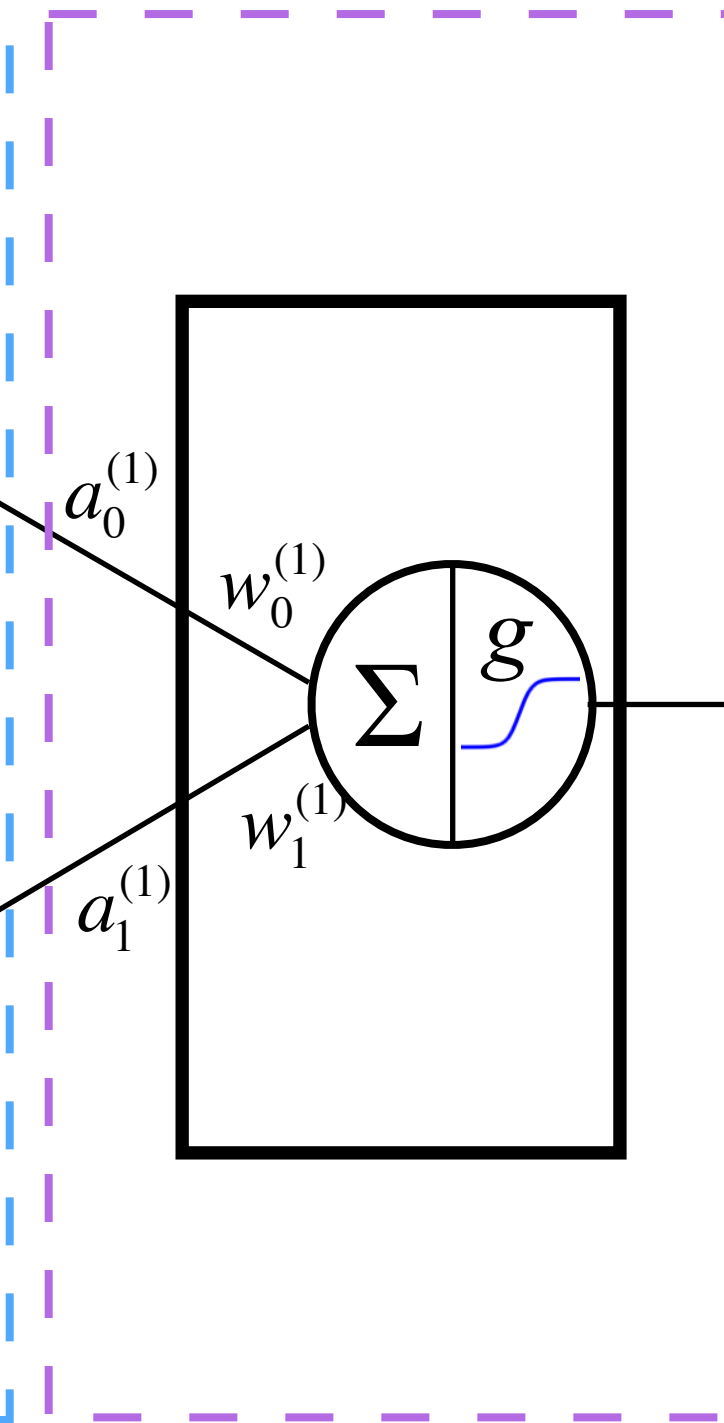
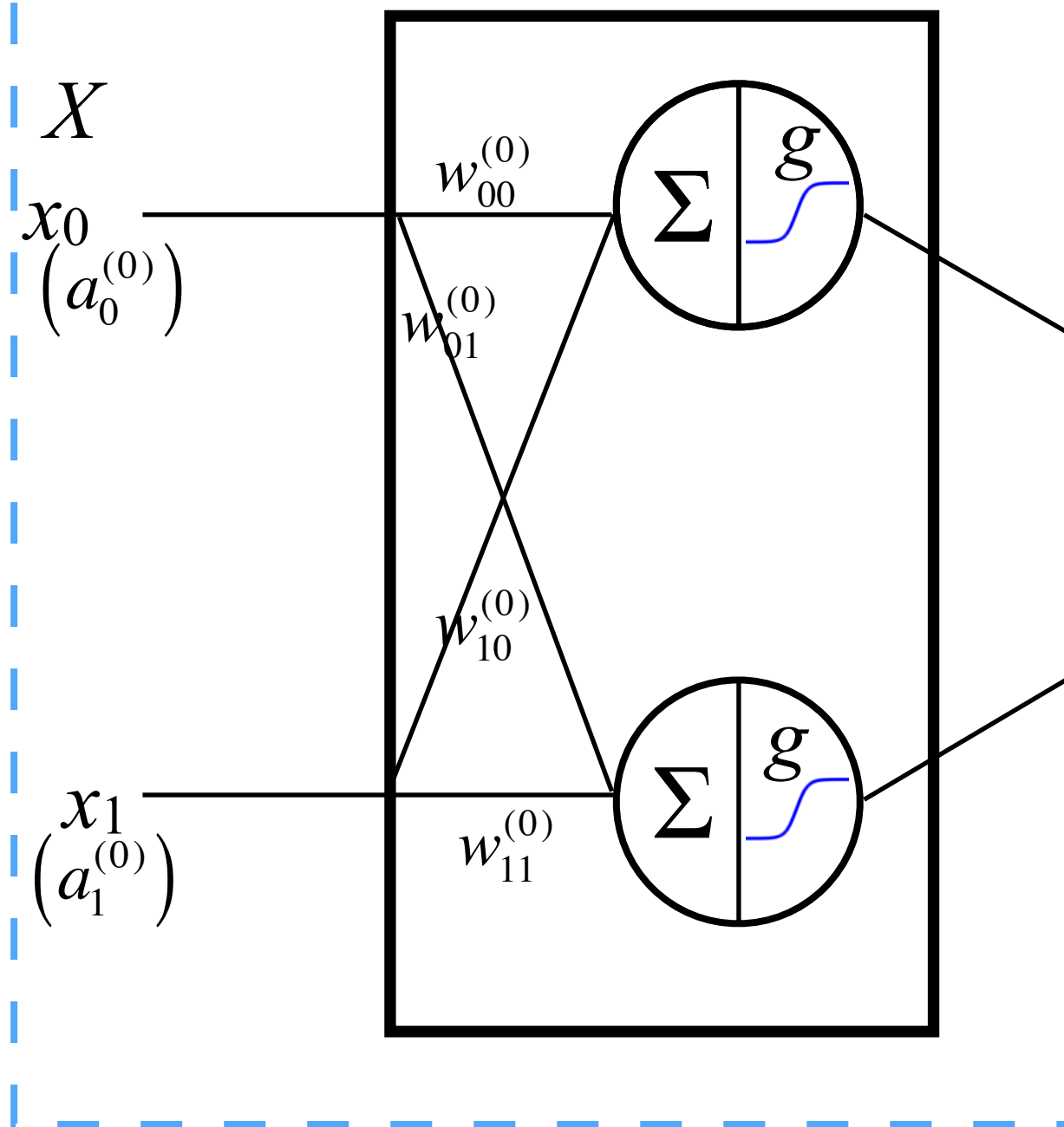
Forward-Feed, Multi-layer Artificial Neural Network — Part II

Layer 0

Layer 1

Layer 2

$(i = 0, 1)$ $(j = 0, 1)$



Note: eqn's (1) and (2) have the same structure:

$$(\text{delta} \otimes a) \cdot \alpha$$

Also note how the δ 's are related.

Eqn (2) is more representative: generally Δw is a $m \times n$ matrix, the outer product of two vectors, δ (n -dim) and the input, a (m -dim).

$$\text{delta0}_j = \delta_j^{(0)} = \delta^{(1)} w_j^{(1)} \cdot g'(a_j^{(1)})$$

$$\Delta w_{ij}^{(0)} = \delta_j^{(0)} a_i^{(0)} \alpha \quad (2)$$

input for layer 0

output for layer 0

$$\text{delta1} = \delta^{(1)} = (y - z) \cdot z(1 - z) = (y - z) \cdot g'(a_0^{(2)})$$

$$\Delta w_j^{(1)} = \delta^{(1)} a_j^{(1)} \alpha \quad (1')$$

input for layer 1

output for layer 1