From the Perceptron to Neural Networks

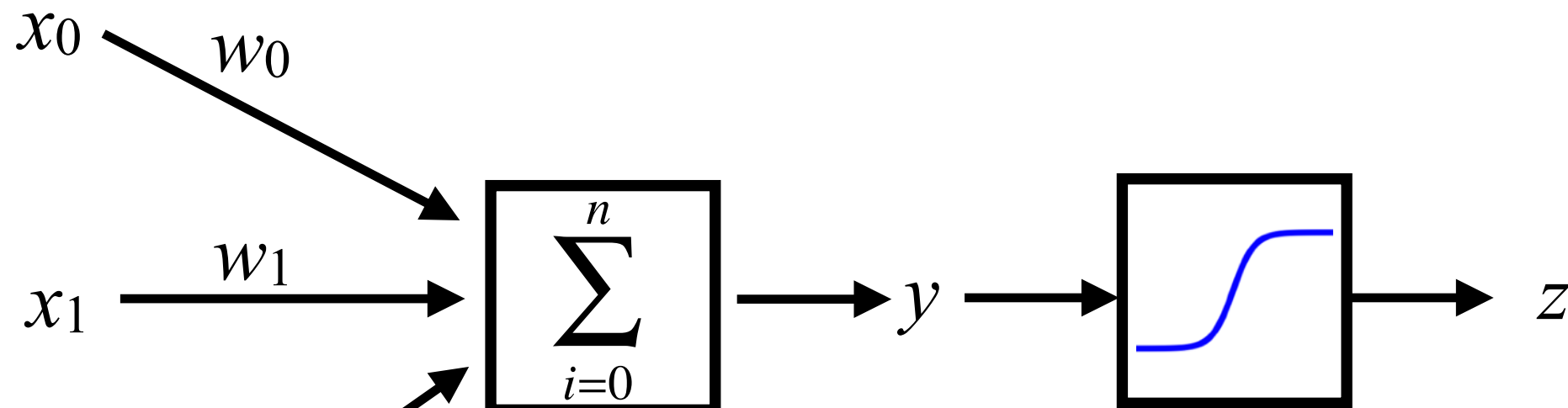# Quick Review

The Perceptron — Single Layer Neural Network

x_0

w_0

x_1 w_1

.
.
.

w_{n-1}

x_{n-1}

w_n

1

$$\sum_{i=0}^{n}$$

y

z
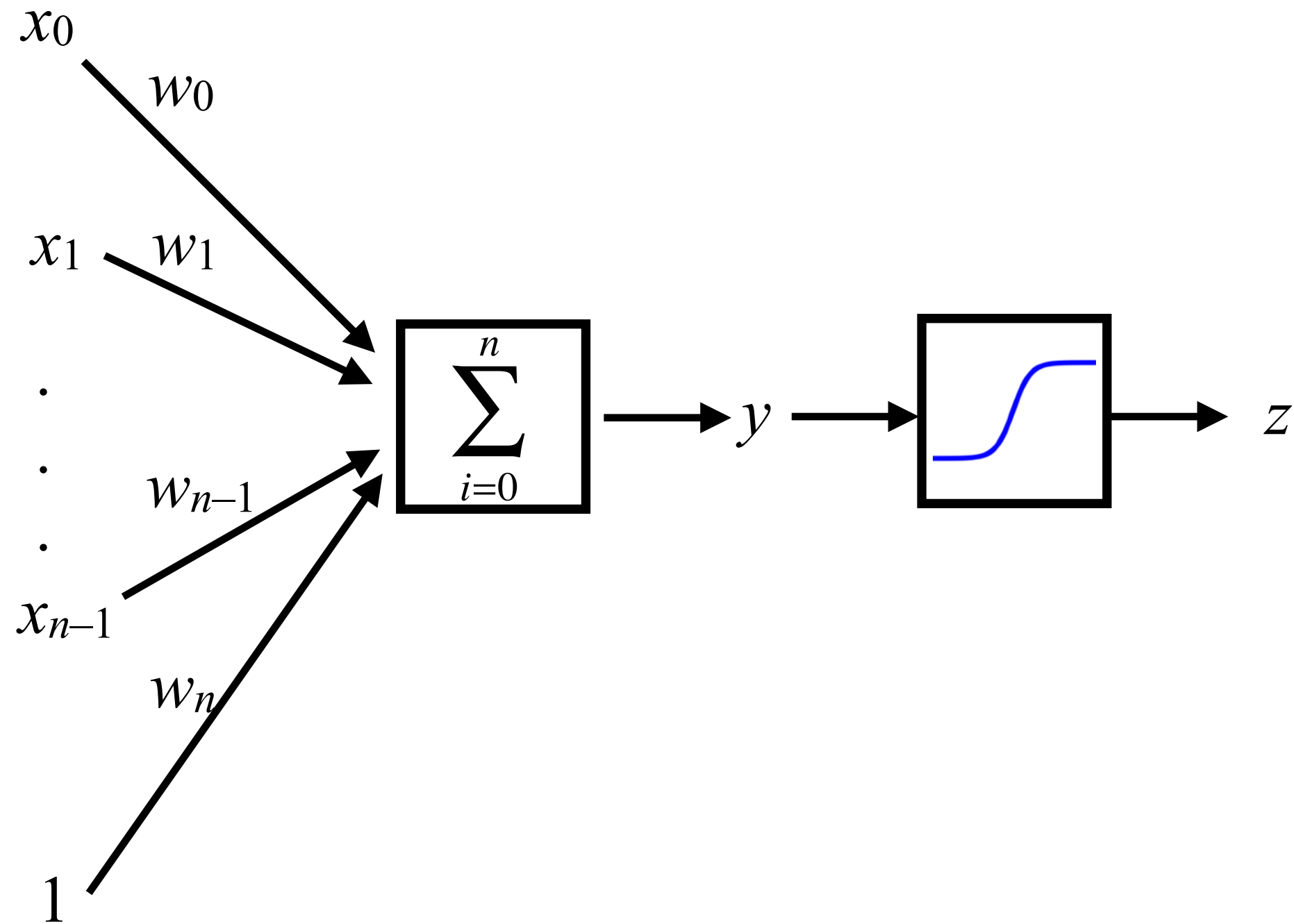
An alternative Sigmoid (There're others, too)

The NOR Gate Problem

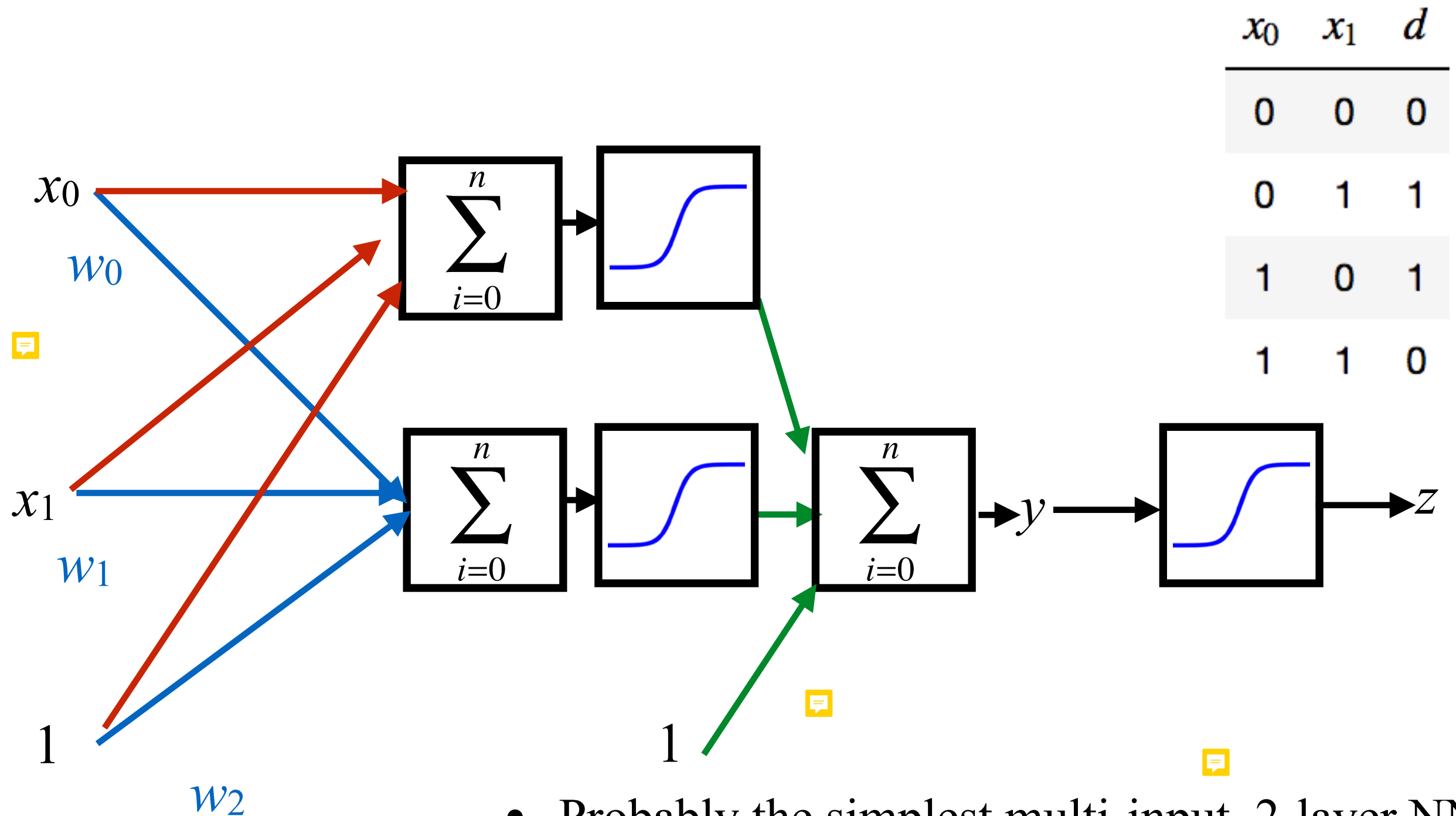| x_0	x_1	d
0	0	1
0	1	0
1	0	0
1	1	0

If these 4 points are plotted in the x_0-x_1 plane, the boundary would be a straight line that does NOT pass through the origin — which is what the weight makes possible.

The XOR Gate Problem

x_0	x_1	d
0	0	0
0	1	1
1	0	1
1	1	0

If these 4 points are plotted in the x_0-x_1 plane, is it possible to define a linear boundary?

The XOR Gate Problem

x_0	x_1	d
0	0	0
0	1	1
1	0	1
1	1	0

- Probably the simplest multi-input, 2-layer NN
- Forward and backward propagation

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End of Week 6-1