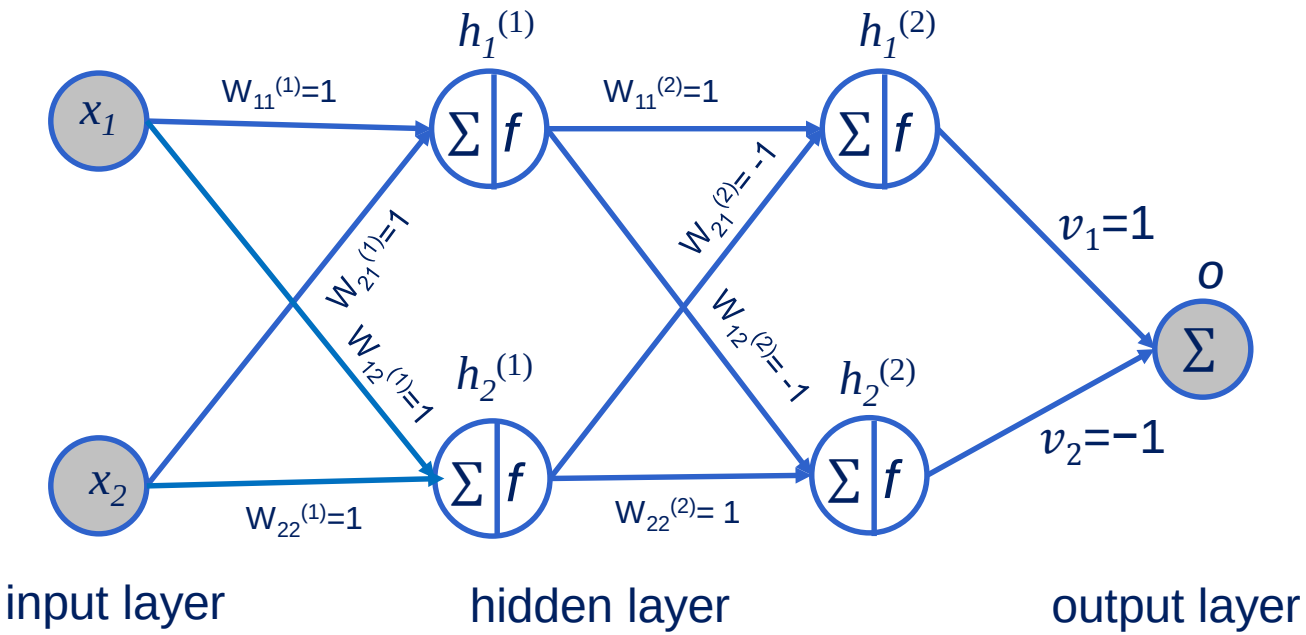
Neural Network

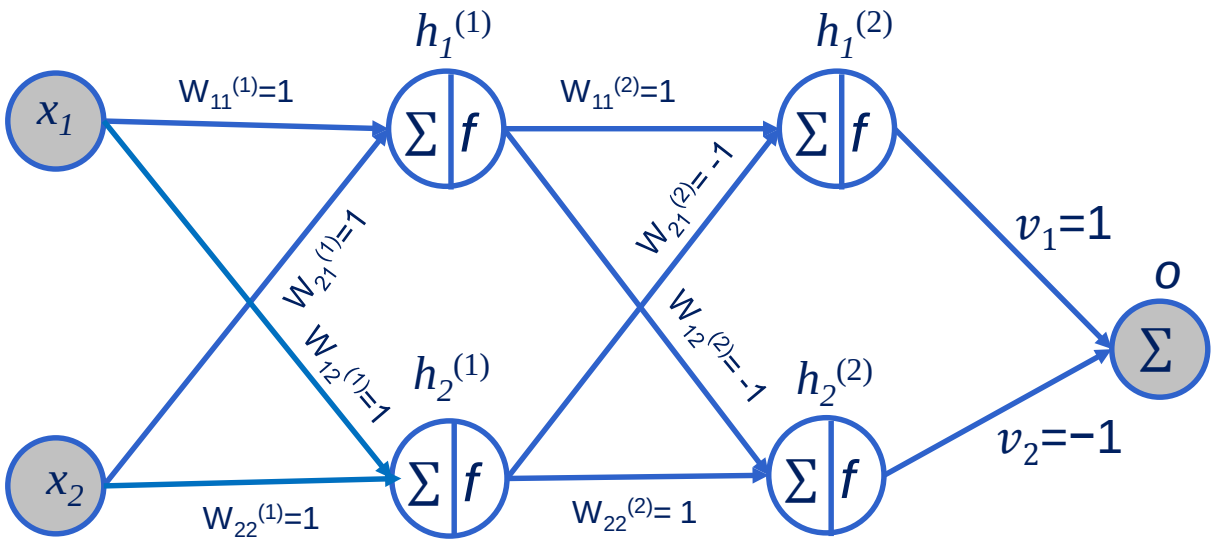


- Suppose we use sigmoid function (i.e., $f(x) = \frac{1}{1+\exp(-x)}$) as the activation function in this network. All the bias are set to 0.
- Given a sample x_1 = 0 and x_2=0, what are the output values of each node.

node	output Value
$h_1^{(1)}$	
$h_2^{(1)}$	
$h_1^{(1)}$	
$h_2^{(2)}$	
o	

Solution

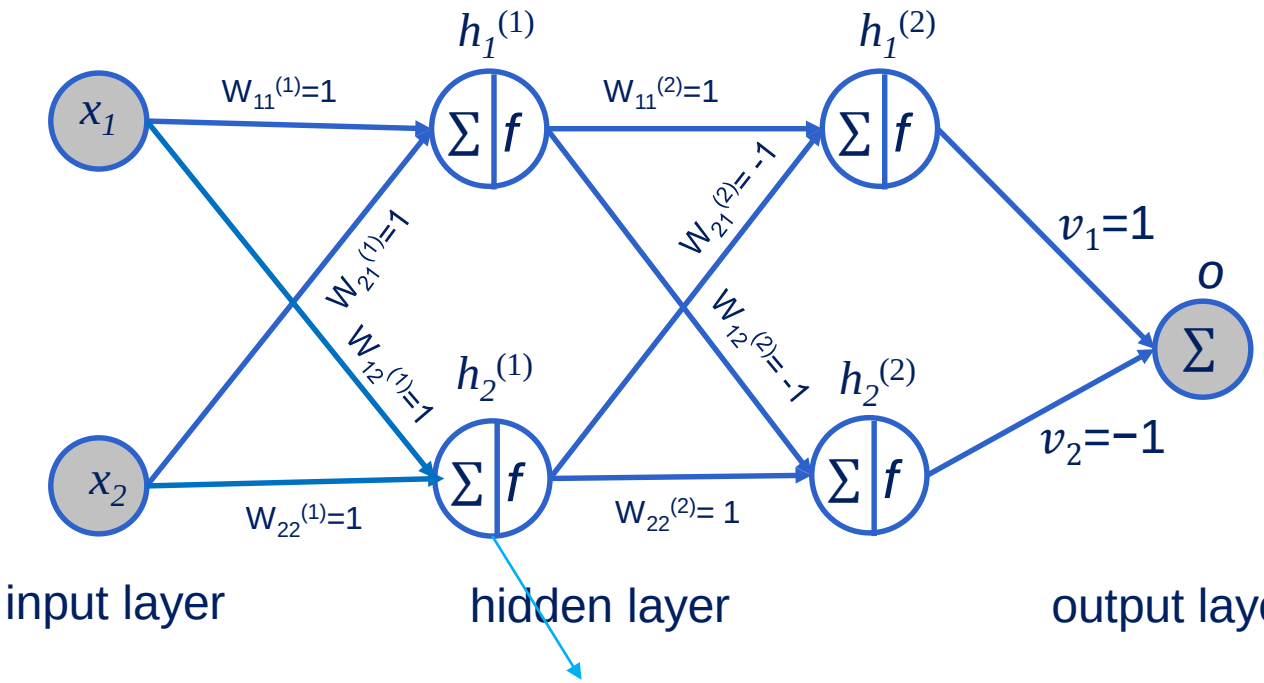
$$\frac{1}{1+\exp(-(1*0+1*0))} = \frac{1}{1+\exp(0)} = 0.5$$



input layer hidden layer output layer

Neural Network

$$\frac{1}{1+\exp(-(1*0+1*0))} = \frac{1}{1+\exp(0)} = 0.5$$

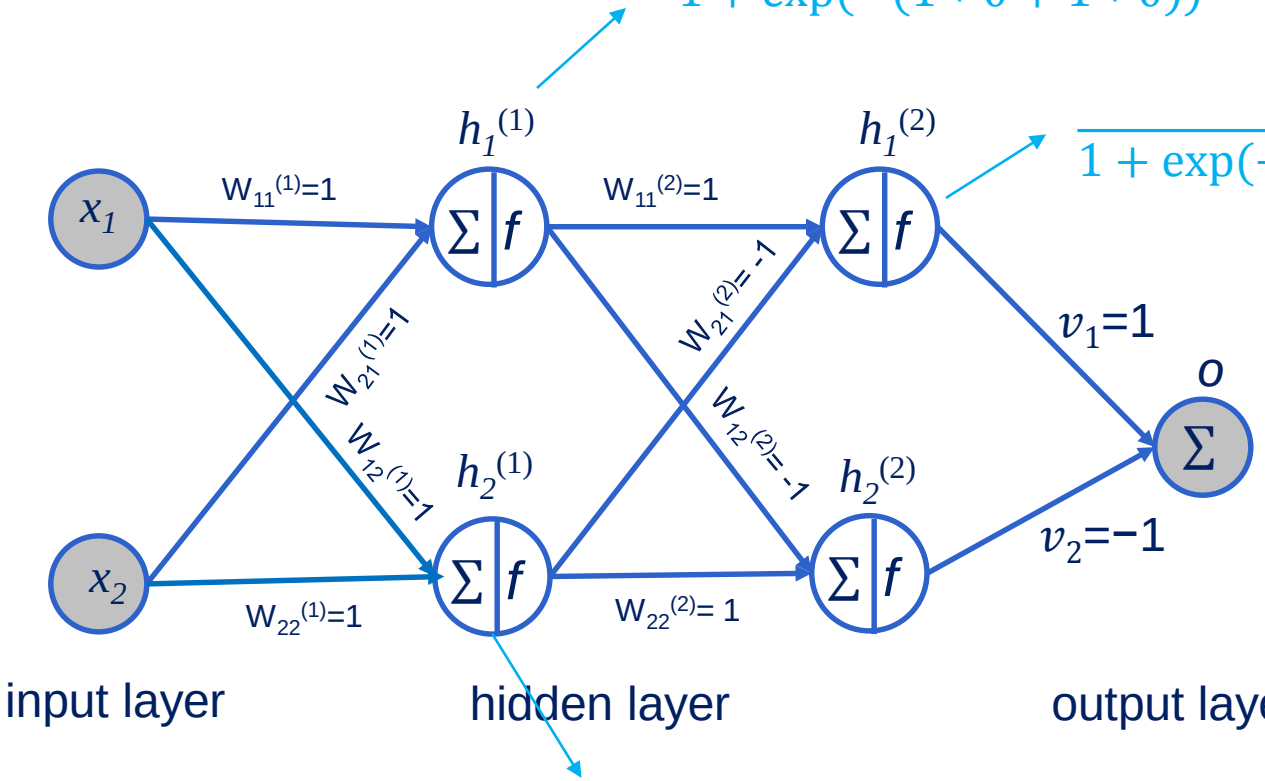


$$\frac{1}{1+\exp(-(1*0+1*0))} = \frac{1}{1+\exp(0)} = 0.5$$

Neural Network

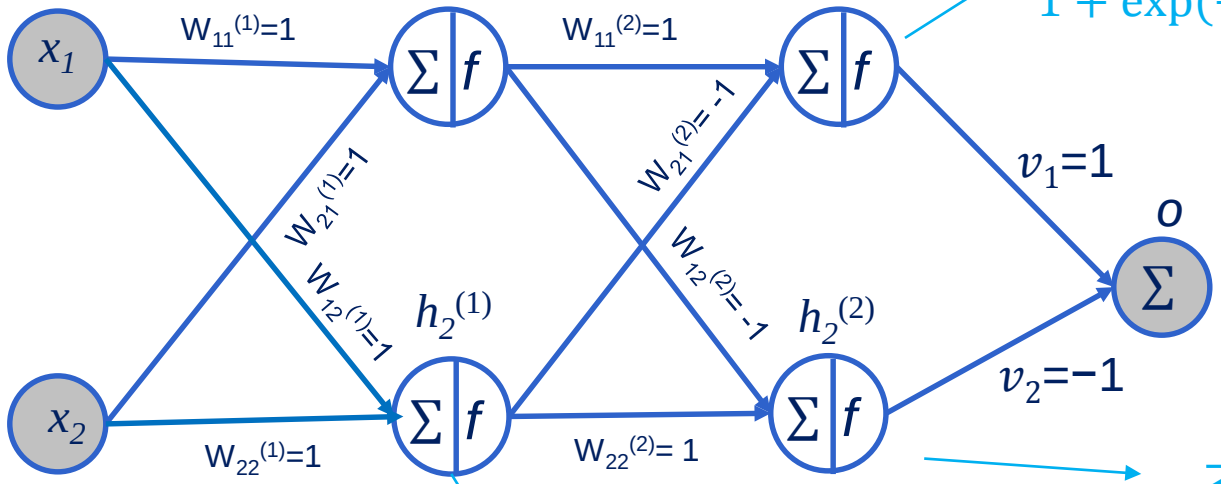
$$\frac{1}{1+\exp(-(1*0+1*0))} = \frac{1}{1+\exp(0)} = 0.5$$

$$\frac{1}{1+\exp(-(1*0.5+(-1)*0.5))} = \frac{1}{1+\exp(0)} = 0.5$$



$$\frac{1}{1+\exp(-(1*0+1*0))} = \frac{1}{1+\exp(0)} = 0.5$$

Neural Network



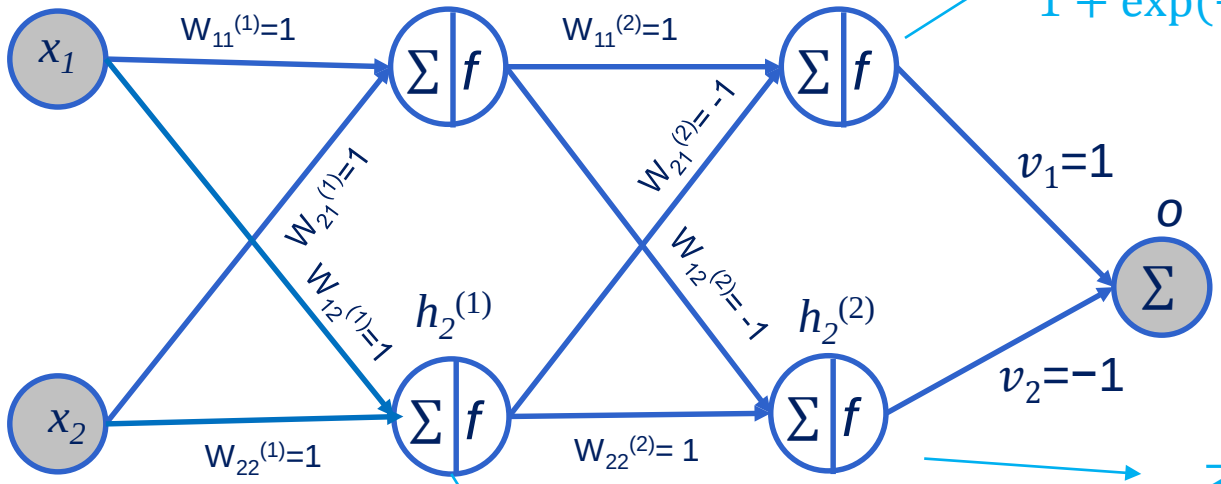
$$\frac{1}{1+\exp(-(1*0+1*0))} = \frac{1}{1+\exp(0)} = 0.5$$

$$\frac{1}{1+\exp(-(1*0.5+(-1)*0.5))} = \frac{1}{1+\exp(0)} = 0.5$$

$$\frac{1}{1+\exp(-(1*0.5+(-1)*0.5))} = \frac{1}{1+\exp(0)} = 0.5$$

$$\frac{1}{1+\exp(-(1*0+1*0))} = \frac{1}{1+\exp(0)} = 0.5$$

Neural Network



$$\frac{1}{1+\exp(-(1*0+1*0))} = \frac{1}{1+\exp(0)} = 0.5$$

$$\frac{1}{1+\exp(-(1*0.5+(-1)*0.5))} = \frac{1}{1+\exp(0)} = 0.5$$

$$0.5*1+0.5*-1=0$$

$$\frac{1}{1+\exp(-(1*0.5+(-1)*0.5))} = \frac{1}{1+\exp(0)} = 0.5$$

$$\frac{1}{1+\exp(-(1*0+1*0))} = \frac{1}{1+\exp(0)} = 0.5$$