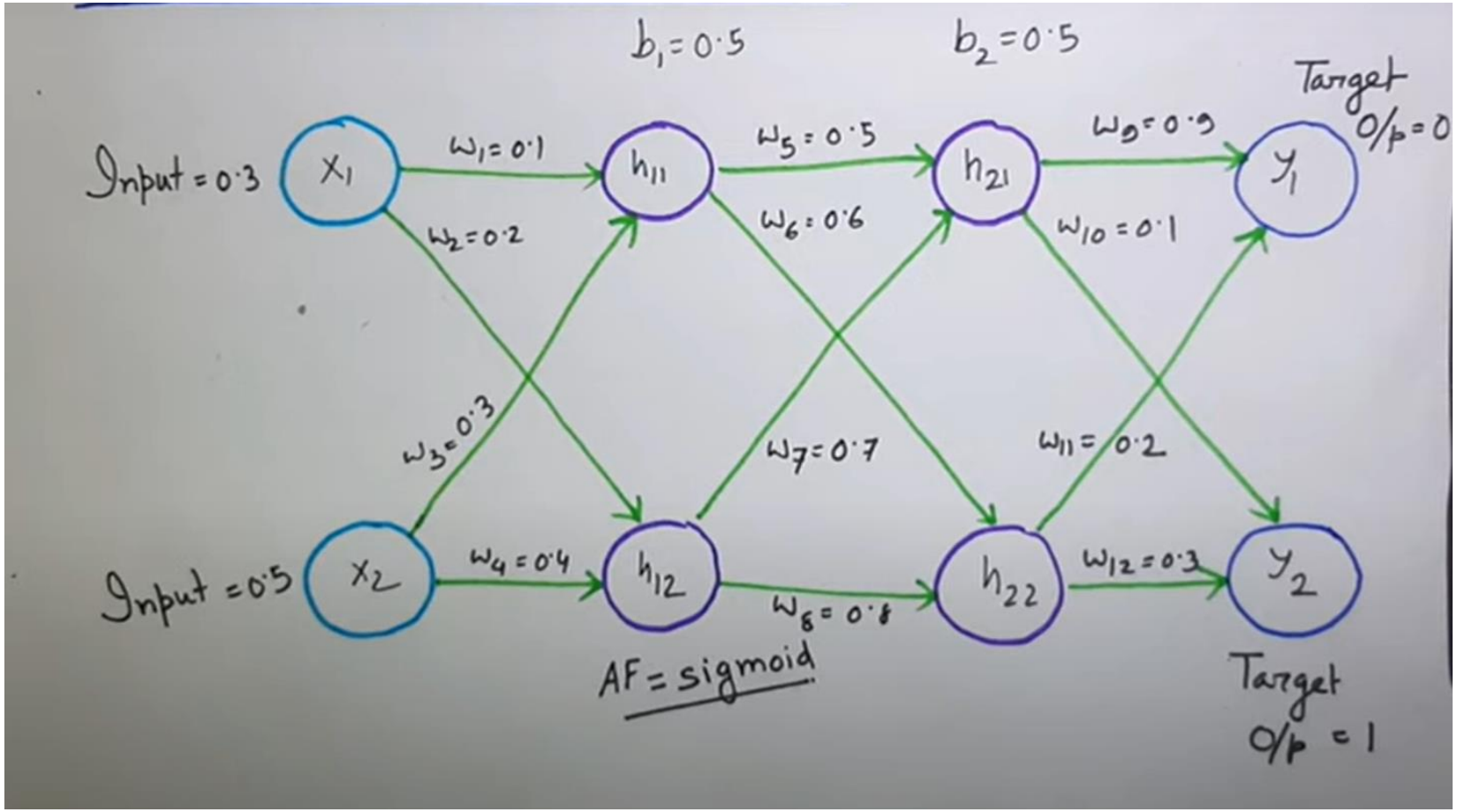
Feed Forward Network

Feed-Forward Network



E/L = Mean Squared Error

$$= \frac{1}{2}\left[\left(y_A^1 - y_T^1\right)^2 + \left(y_A^2 - y_T^2\right)^2\right]$$

$$= \frac{1}{2}\left[\left(0.54 - 0\right)^2 + \left(0.58 - 1\right)^2\right]$$

$$= \frac{1}{2}\left(0.2916 + 0.1764\right)$$

$$= \frac{0.468}{2} = 0.234$$

Feed Forward Network

Given:

1. **Input Layer**:
   - Inputs: $x = [x_1, x_2, x_3] = [1, 0.5, -1]$
2. **Hidden Layer 1**:
   - Weights: $W_1 = \begin{bmatrix} 0.2 & -0.3 & 0.5 \\ 0.1 & 0.6 & -0.4 \end{bmatrix}$ (2 neurons, 3 inputs)
   - Biases: $b_1 = [0.1, -0.2]$
3. **Hidden Layer 2**:
   - Weights: $W_2 = \begin{bmatrix} 0.3 & -0.1 \\ -0.2 & 0.4 \end{bmatrix}$ (2 neurons, 2 inputs)
   - Biases: $b_2 = [0.05, 0.1]$
4. **Output Layer**:
   - Weights: $W_3 = \begin{bmatrix} 0.5 & -0.6 \end{bmatrix}$ (1 output neuron, 2 inputs)
   - Bias: $b_3 = 0.2$
5. **Activation Function**:
   - Sigmoid: $\sigma(z) = \frac{1}{1+e^{-z}}$