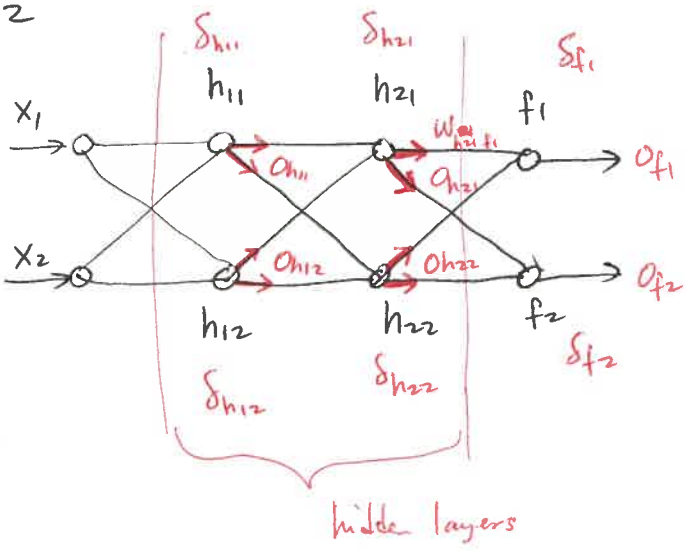
Exercise #2



training pattern:

	x_1	x_2	d_{f1}	d_{f2}
1				
2				
3				
4				

$$\delta_{f1} = (d_{f1} - o_{f1}) \times o_{f1}(1 - o_{f1})$$

$$w_{h21f1} = w_{h21f1} + \alpha \delta_{f1} o_{h21}$$

$$w_{h22f1} = w_{h22f1} + \alpha \delta_{f1} o_{h22}$$

$$\delta_{f2} = (d_{f2} - o_{f2}) \times o_{f2}(1 - o_{f2})$$

$$w_{h21f2} = w_{h21f2} + \alpha \delta_{f2} o_{h21}$$

$$w_{h22f2} = w_{h22f2} + \alpha \delta_{f2} o_{h22}$$

hidden layer 2 (weights leading to hidden layer 2)

$$\delta_{h21} = O_{h21}(1 - O_{h21}) \times \sum_{j=1}^{m-\text{output units}} \delta_{fj} W_{h21\,fj}$$

$$W_{h_{11}h21} = W_{h_{11}h21} + \alpha \delta_{h21} O_{h_{11}}$$

$$W_{h_{12}h21} = W_{h_{12}h21} + \alpha \delta_{h21} O_{h12}$$

$$\delta_{h22} = O_{h22}(1 - O_{h22}) \times \sum_{j} \delta_{fj} W_{h22\,fj}$$

$$W_{h_{11}h22} = W_{h_{11}h22} + \alpha \delta_{h22} O_{h_{11}}$$

$$W_{h12\,h22} = W_{h12\,h22} + \alpha \delta_{h22} O_{h12}$$

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hidden layer 1

$$\delta_{h_{11}} = O_{h_{11}}(1 - O_{h_{11}}) \times \sum_{j=21}^{22} \delta_{hj} W_{h_{11}hj}$$

$$W_{x_1 h_{11}} = W_{x_1 h_{11}} + \alpha \delta_{h_{11}} X_1$$

$$W_{x_2 h_{11}} = W_{x_2 h_{11}} + \alpha \delta_{h_{11}} X_2$$

$$\delta_{h12} = O_{h12}(1 - O_{h12}) \times \sum_{j=21}^{22} \delta_{hj} W_{h12\,hj}$$

$$W_{x_1 h12} = W_{x_1 h12} + \alpha \delta_{h12} X_1$$

$$W_{x_2 h12} = W_{x_2 h12} + \alpha \delta_{h12} X_2$$