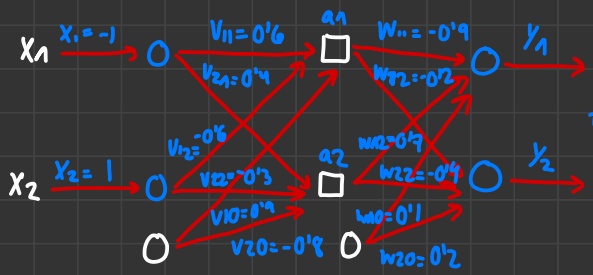
Problema 3

Coeficient Aprenentatge = 0'8



2-

$net^1_{a1} = x_1 V^1_{11} + x_2 V^1_{12} + V^1_{10} = -1(0'6) + 1 \cdot (-0'6) + 0'9 = -0'3$

$net^1_{a2} = x_1 V^1_{21} + x_2 V^1_{22} + V^1_{20} = -1(0'4) + 1(-0'3) - 0'8 = -1'5$

$a^1_1 = f_1(net^1_{a1}) = -0'3$

$a^1_2 = f_2(net^1_{a2}) = -1'5$

$net^2_{y1} = a_1 W^2_{11} + a_2 W^2_{12} + W^2_{10} = -0'3(-0'9) - 1'5(0'7) + 0'1 = -0'68$

$net^2_{y2} = a_1 W^2_{21} + a_2 W^2_{22} + W^2_{20} = -0'3(-0'2) - 1'5(0'4) + 0'2 = -0'34$

$y^2_1 = f_1(net^2_{a1}) = -0'68$

$y^2_2 = f_1(net^2_{a2}) = -0'34$

Target = [1, -1] → $d_1 = 1$, $d_2 = -1$

3-

$\delta^2_{y1} = (d_1 - y^2_1) \cdot f_s'(net^2_1) = (1 + 0'68) \cdot 1 = 1'68$

$\delta^2_{y2} = (d_2 - y^2_2) \cdot f_s'(net^2_2) = (-1 + 0'34) \cdot 1 = -0'66$

$\delta^1_{a1} = (\delta^2_{y1} W^2_{11} + \delta^2_{y2} W^2_{21}) \cdot f_s'(net^1_1) = 1'68 \cdot (-0'9) - 0'66 \cdot (-0'2) \cdot 1 = -1'38$

$\delta^1_{a2} = (\delta^2_{y1} W^2_{12} + \delta^2_{y2} W^2_{22}) \cdot f_s'(net^2_2) = 1'68 \cdot 0'7 - 0'66 \cdot (-0'4) \cdot 1 = 1'44$

4-

$W^2_{11}(t+1) = W^2_{11}(t) + \eta \delta^2_{y_1} a^1_1 = -0'9 + 0'8 \cdot 1'68 \cdot (-0'3) = -1'30$

$W^2_{21}(t+1) = W^2_{21}(t) + \eta \delta^2_{y_2} a^1_2 = -0'2 + 0'8 \cdot (-0'66) \cdot (-1'5) = 0'59$

$W^2_{12}(t+1) = W^2_{12}(t) + \eta \delta^2_{y_1} a^1_1 = 0'7 + 0'8 \cdot 1'68 \cdot (-0'3) = 0'3$

$W^2_{22}(t+1) = W^2_{22}(t) + \eta \delta^2_{y_2} a^1_2 = -0'4 + 0'8 \cdot (-0'66) \cdot (-1'5) = 0'39$

$W^2_{10}(t+1) = W^2_{10}(t) + \eta \delta^2_{y_1} a^1_0 = 0'1 + 0'8 \cdot 1'68 \cdot 1 = 1'44$

$W^2_{20}(t+1) = W^2_{20}(t) + \eta \delta^2_{y_2} a^1_0 = 0'2 + 0'8 \cdot (-0'66) \cdot 1 = -0'33$

$V^1_{11}(t+1) = V^1_{11}(t) + \eta \delta^1_{a_1} x_1 = 0'6 + 0'8 \cdot (-1'38) \cdot (-1) = 1'7$

$V^1_{21}(t+1) = V^1_{21}(t) + \eta \delta_{a_2} x_1 = 0'4 + 0'8 \cdot 1'44 \cdot (-1) = -0'75$

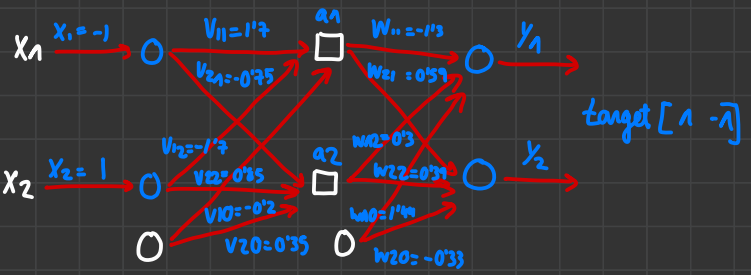
$V^1_{12}(t+1) = V^1_{12}(t) + \eta \delta_{a_1} x_2 = (-0'6) + 0'8 \cdot (-1'38) \cdot 1 = -1'7$

$V^1_{22}(t+1) = V^1_{22}(t) + \eta \delta_{a_2} x_2 = (-0'3) + 0'8 \cdot 1'44 \cdot 1 = 0'85$

$V^1_{10}(t+1) = V^1_{10}(t) + \eta \delta_{a_1} x_0 = 0'9 + 0'8 \cdot (-1'38) \cdot 1 = -0'2$

$V^1_{20}(t+1) = V^1_{20}(t) + \eta \delta_{a_2} x_0 = (-0'8) + 0'8 \cdot 1'44 \cdot 1 = 0'35$

5-



$net^1_{a_1} = x_1 v_{11} + x_2 v_{12} + v_{10} = -1 \cdot 1'7 + 1 \cdot (-1'7) + (-0'2) = -3'6$

$net^1_{a_2} = x_1 v_{21} + x_2 v_{22} + v_{20} = -1 \cdot (-0'75) + 1 \cdot 0'85 + 0'35 = 1'95$

$a^1_1 = f_1(net_{a_1}) = -3'6$

$a^1_2 = f_2(net_{a_2}) = 1'95$

$net^2_{y_1} = a_1 w_{11} + a_2 w_{12} + w_{10} = -3'6 \cdot (-1'3) + 1'95 \cdot (0'3) + 1'44 = 6'71$

$net^2_{y_2} = a_1 w_{21} + a_2 w_{22} + w_{20} = -3'6 \cdot (0'59) + 1'95 \cdot (0'39) + (-0'33) = -1'69$

$y_1^3 = (net_{a1}^3) = 0'71$

$y_2^3 = (net_{a2}^3) = -1'69$

$\delta_1^2 = (d_1 - y_1^3) \cdot f_s'(net_1^2) = (1 - 0'71) \cdot 1 = -5'71$

$\delta_2^2 = (d_2 - y_2^3) \cdot f_s'(net_2^2) = (-1 + 1'69) \cdot 1 = 0'69$

$\delta_1^1 = (\delta_1^2 w_{11}^2 + \delta_2^2 w_{21}^2) \cdot f_s'(net_1^1) = -5'71 \cdot (-1'3) + 0'69 \cdot 0'59 = 7'83$

$\delta_2^1 = (\delta_1^2 w_{12}^2 + \delta_2^2 w_{22}^2) \cdot f_s'(net_2^1) = -5'71 \cdot 0'3 + 0'69 \cdot 0'39 = -1'44$

S'ha augmentat l'error respecte la primera iteració