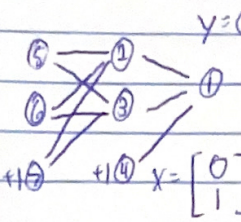
# CS 472 Backpropagation HW




$w_{21} = 1.00420$ $w_{51} = 1$ $w_{53} = 1$
$w_{31} = 1.0042$ $w_{61} = 1$ $w_{63} = 1$
$w_{41} = 1.00575$ $w_{72} = 1.00113$ $w_{73} = 1.00113$

$net_2 = 0 + 1 + 1.00113 = 2.00113$
$net_3 = 0 + 1 + 1.00113 = 2.00113$

$a_2 = \frac{1}{1+e^{-2.00113}} = .881$

$a_3 = \frac{1}{1+e^{-2.00113}} = .881$

$a_4 = 1$

$net_1 = 1.0042(.881) + 1.0042(.881) + 1.00575 = 2.775$

$a_1 = \frac{1}{1+e^{-2.775}} = .941$

$\delta_1 = (0-.941).941(1-.941) = -.0522$

$\Delta w_{21} = 1(.881)(-.0522) = -.046$
$\Delta w_{31} = 1(.881)(-.0522) = -.046$
$\Delta w_{41} = 1(1)(-.0522) = -.0522$

$\delta_2 = a_2(1-a_2)\delta_1 w_{21} = .881(1-.881)(-.0522)(1.0042) = -.0055$
$\delta_3 = -.0055$

$\Delta w_{52} = 1(0)(-.0055) = 0$ $\Delta w_{53} = 1(0)(-.0055) = 0$
$\Delta w_{62} = 1(1)(-.0055) = -.0055$ $\Delta w_{63} = 1(1)(-.0055) = -.0055$
$\Delta w_{72} = 1(1)(-.0055) = -.0055$ $\Delta w_{73} = 1(1)(-.0055) = -.0055$

| | | |
|---|---|---|
| $w_{21} = .959$ | $w_{52} = 1$ | $w_{53} = 1$ |
| $w_{31} = .958$ | $w_{62} = .995$ | $w_{63} = .995$ |
| $w_{41} = .954$ | $w_{72} = .996$ | $w_{73} = .996$ |