```
x = {{0, 0}, {0, 1}, {1, 0}, {1, 1}};
t = {{0}, {1}, {1}, {1}};
x = Map[Append[#, -1] &, x]
w = RandomReal[{-.1, .1}, {Length[First[x]], 1}]
```

$\{\{0, 0, -1\}, \{0, 1, -1\}, \{1, 0, -1\}, \{1, 1, -1\}\}$

$\{\{0.0880997\}, \{0.0407375\}, \{0.0899978\}\}$

In[734]:=
```
x = {{0, 0}, {0, 1}, {1, 0}, {1, 1}};
t = {{0, 1}, {1, 1}, {1, 1}, {1, 0}};
x = Map[Append[#, -1] &, x]
w = RandomReal[{-.1, .1}, {Length[First[x]], Length[First[t]]}]
```

Out[736]= $\{\{0, 0, -1\}, \{0, 1, -1\}, \{1, 0, -1\}, \{1, 1, -1\}\}$

Out[737]= $\{\{-0.0555815, 0.0248692\}, \{0.0839794, -0.0814378\}, \{-0.0898078, -0.0779983\}\}$

In[745]:=
```
tf[z_] := If[z > 0, 1, 0]
y = x . w
y = Map[tf[#] &, y, {2}]
MatrixForm[Transpose[x]]
MatrixForm[t - y]
d = Transpose[x].(t - y)
w += .1 * d
```

Out[746]= $\{\{-0.0101922, 0.0779983\}, \{0.0737872, -0.00343947\},$
$\{-0.0657737, 0.00286746\}, \{0.0182057, -0.0785703\}\}$

Out[747]= $\{\{0, 1\}, \{1, 0\}, \{0, 1\}, \{1, 0\}\}$

Out[748]//MatrixForm=
$$\begin{pmatrix} 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ -1 & -1 & -1 & -1 \end{pmatrix}$$

Out[749]//MatrixForm=
$$\begin{pmatrix} 0 & 0 \\ 0 & 1 \\ 1 & 0 \\ 0 & 0 \end{pmatrix}$$

Out[750]= $\{\{1, 0\}, \{0, 1\}, \{-1, -1\}\}$

Out[751]= $\{\{0.0444185, -0.0751308\}, \{0.0839794, 0.0185622\}, \{-0.0898078, -0.177998\}\}$

```
Plot3D[{0, Map[If[First[#] > 0, 1, 0] &, {{a, b, -1}}.w]}, {a, 0, 1}, {b, 0, 1}]
```