Inputs:- $x_1=[1,-2,1.5,0]$, $x_2=[1,-0.5,-2,-1.5]$, $x_3=[0,1,-1,1.5]$

desired output = $d=[1,-1,1]$, $c=1$, Activation function is Signum function

$$sgn(net)=\begin{cases}1 & \text{if } net>0\\ -1 & \text{if } net<0.\end{cases}$$

Initial weight vector $w^0=[1,-1,0,0.5]$

Step 1: Apply 1st input x_1 & use w^0 to compute net

$$net = x_1 \cdot w^0 = 1\times1+(-2)\times(-1)+(1.5\times0)+(0\times0.5)$$

$$net = 1+2+1.5+0 = 4.5$$

Since $net = 4.5 > 0$, thus $0 = sgn(net) = sgn(4.5) = +1$.

Since, computed output o is same as desired output $d[1]$

$\Delta w = c\times(d-o)\cdot x_1$ – weight increment

$= 1\times(0)\cdot[1,-2,1.5,0]$

$\Delta W = [0,0,0,0]$

$\therefore w^1 = w^0 + \Delta w$

$w^1 = [1,-1,0,0.5]+[0,0,0,0] = w^0$

$\therefore \boxed{w^1=[1,-1,0,0.5]}$

Step 2:- Use w^1 & x_2 need to be applied.

(Continue in the same way for x_3 also)

$net = w^1 \times x_2 = [1,-1,0,0.5]\times[1,-0.5,-2,-1.5]$

$= [1+0.5+0-0.75] = [1.5-0.75]$

$net = 0.75$ since $net>0$ $sgn(0.75)=+1$

$\therefore o=+1$ but $d[2]=-1$.

Thus, computed output $o \neq d$

$\therefore$ Compute weight adjustment $\Delta w = c(d-o)\cdot x_2$

$\Delta w = 1\times(-1-1)\cdot[1,-0.5,-2,1.5]$

$= -2[1,-0.5,-2,-1.5]$

$\Delta w = [-2,1,4,3.0]$

$\therefore w^2 = w^1+\Delta w = [1,-1,0,0.5]+[-2,1,4,3.0]$

$\boxed{w^2=[-1,0,4,3.5]}$

Step 3 :- Apply $x3 = [0, 1, -1, 1.5]$ & use $w^2 = [-1, 0, 4, 3.5]$

$$net = x3 \cdot w^2 = 0 + 0 - 4 + 5.25$$

$$net. = 1.25$$

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since, $net > 0$, $O = Sgn(1.25) = +1$.

As desired output $d[3] = +1$.

we have $d = 0$ & thus $(d - O)$ will be zero in

$$\Delta W = c \cdot (d - O) \cdot x3.$$

Thus $\Delta W = [0, 0, 0, 0]$.

$$\therefore w^3 = w^2 + \Delta W = w^2$$

$$\boxed{w^3 = [-1, 0, 4, 3.5]}$$