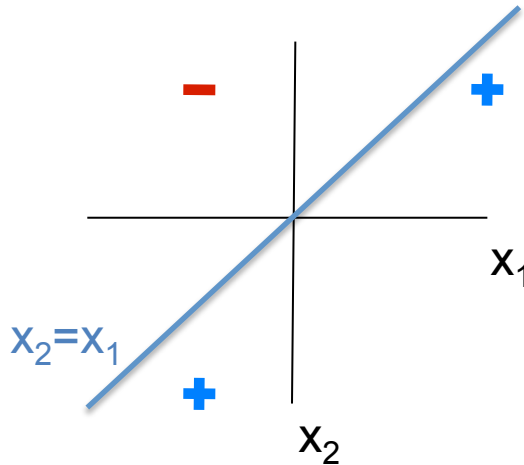


- For  $t=1..T$ ,  $i=1..n$ :
  - $y = \text{sign}(w \cdot x^i)$
  - if  $y \neq y^i$ 

$$w = w + y^i x^i$$

$x_1$	$x_2$	$y$
3	2	1
-2	2	-1
-2	-3	1



Initial:

- $w = [0,0]$

$t=1, i=1$

- $[0,0] \cdot [3,2] = 0$ ,  $\text{sign}(0)=-1$

- $w = [0,0] + [3,2] = [3,2]$

$t=1, i=2$

- $[3,2] \cdot [-2,2] = -2$ ,  $\text{sign}(-2)=-1$

$t=1, i=3$

- $[3,2] \cdot [-2,-3] = -12$ ,  $\text{sign}(-12)=-1$

- $w = [3,2] + [-2,-3] = [1,-1]$

$t=2, i=1$

- $[1,-1] \cdot [3,2] = 1$ ,  $\text{sign}(1)=1$

$t=2, i=2$

- $[1,-1] \cdot [-2,2] = -4$ ,  $\text{sign}(-4)=-1$

$t=2, i=3$

- $[1,-1] \cdot [-2,-3] = 1$ ,  $\text{sign}(1)=1$

Converged!!!

- $y = w_1 x_1 + w_2 x_2 \rightarrow y = x_1 - x_2$

- So, at  $y=0 \rightarrow x_2 = x_1$