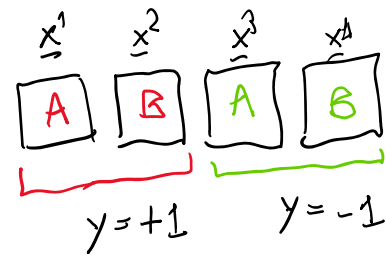
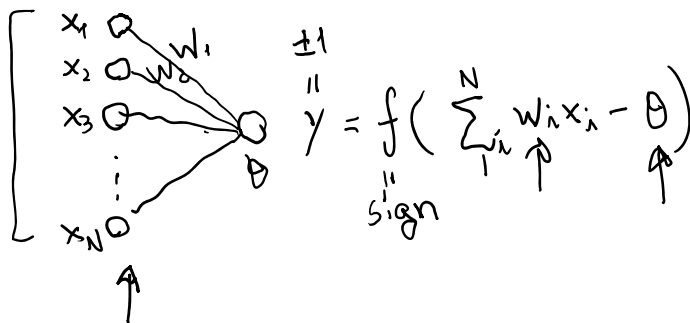
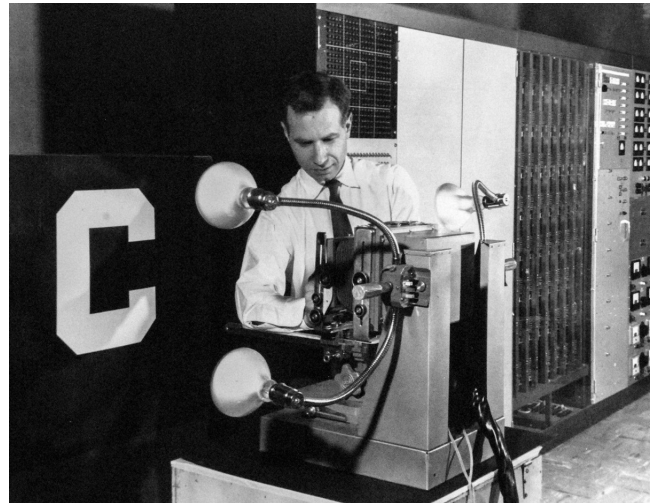
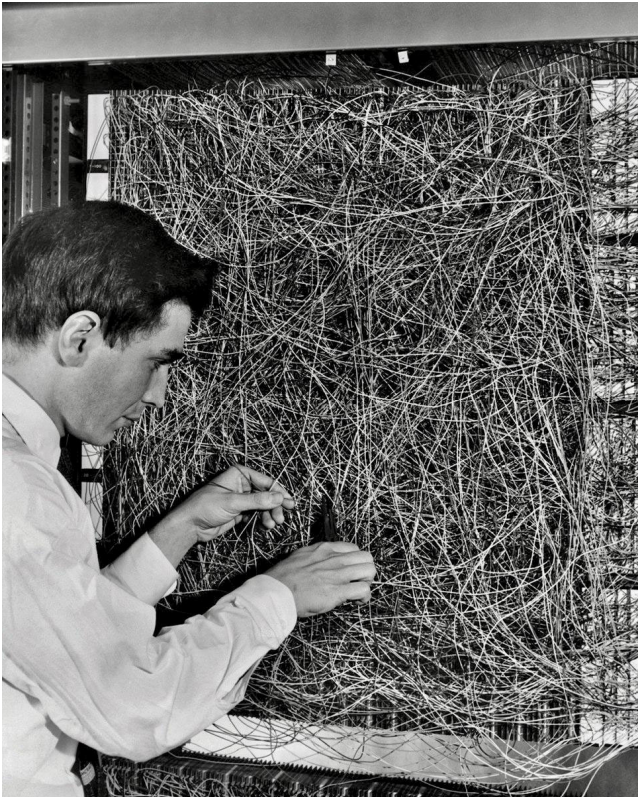


Perceptron (actual lecture)

Tuesday, April 21, 2020 13:15

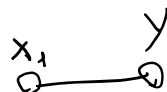
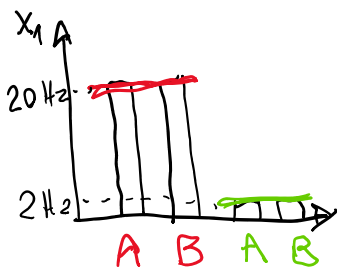


$\{w_i\}, \theta :$

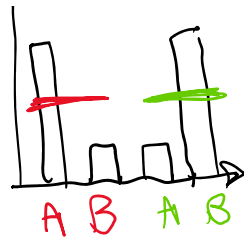
$$y^1 = +1 = f\left(\sum_i w_i x_i^1 - \theta\right)$$

$$y^2 = +1 = f\left(\sum_i w_i x_i^2 - \theta\right)$$

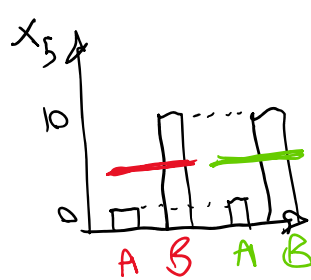
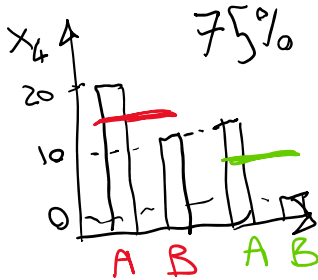
...



(x_2, x_3)		
H	H	Red
L	L	Red



H	H	Red
L	L	Red
H	L	Green
L	H	Green



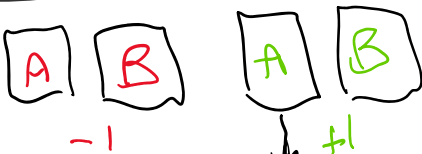
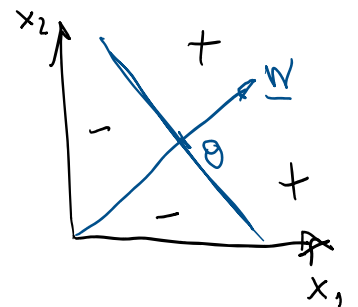
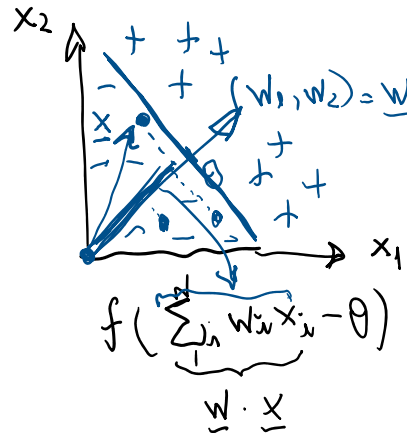
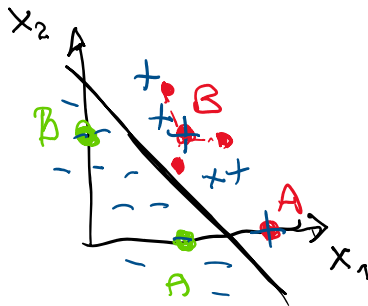
$$w_4 x_4 + w_5 x_5$$

$$20 + 0 = 20$$

$$10 + 10 = 20$$

$$10 + 0 = 10$$

$$0 + 10 = 10$$



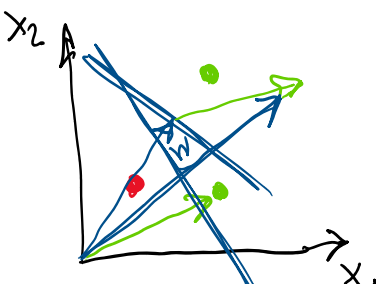
$$x^m, y^m \Rightarrow$$

$$y = f\left(\sum_{i=1}^N w_i x_i - \theta\right)$$

$$y = y^m? \text{ yes: } \underline{\text{do nothing}}$$

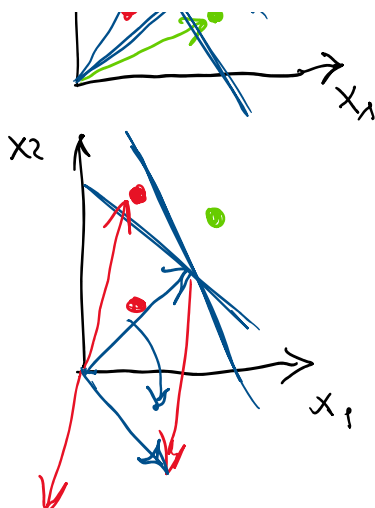
$$\text{no: } w_i \rightarrow w_i + \alpha y^m \cdot x_i^m$$

$$\theta \rightarrow \theta - \alpha y^m$$



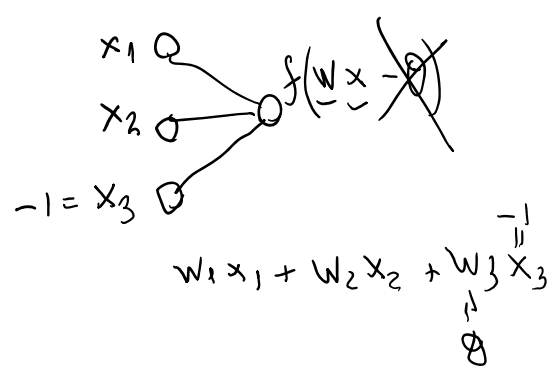
$$\underline{w} \rightarrow \underline{w} + \alpha \underline{x}^m$$

$$x_1 \rightarrow f(\underline{w} \cdot \underline{x} - \theta)$$

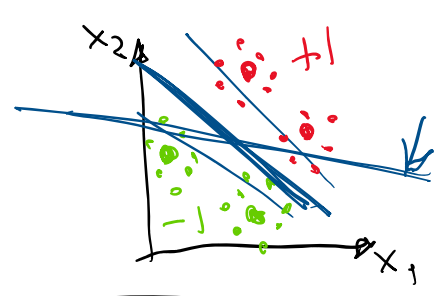


$$\underline{w} \rightarrow \underline{w} - \alpha \underline{x}^m$$

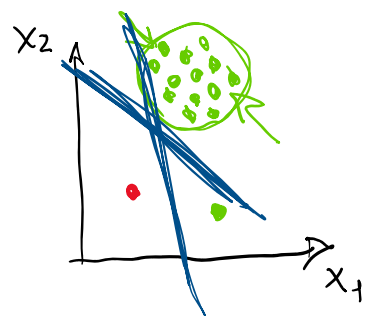
$y^m = -1$



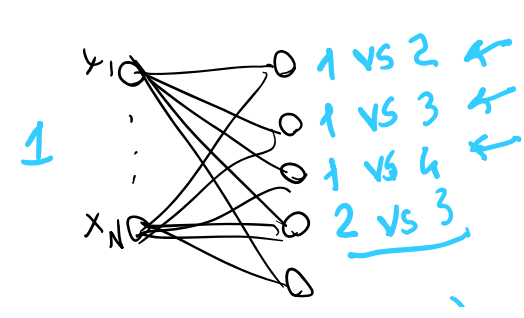
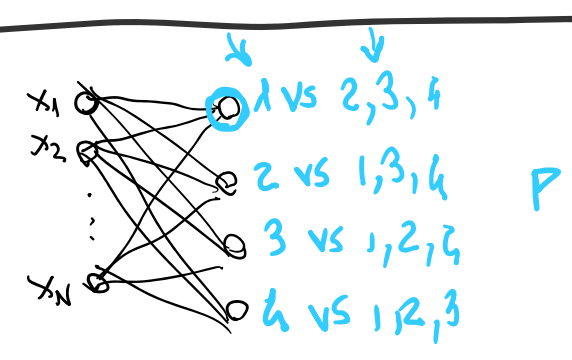
Margin



$$\frac{\underline{w} \cdot \underline{x}^m \cdot y^m}{\|\underline{w}\|} = \gamma$$



A B A B
1 2 3 4
P



$P-1$
 $[0, P-2]$ $\frac{P-2}{2}$

$$\frac{p(p-1)}{2}$$

$$2 \text{ vs } 1$$

L-11

