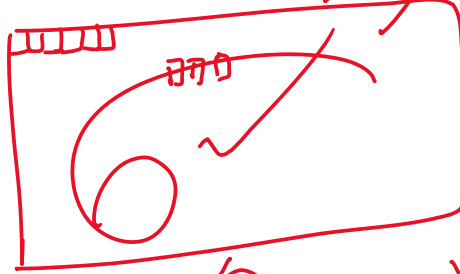
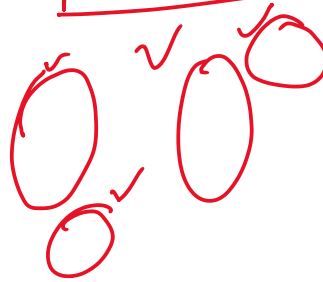


Image ✓✓✓

easy
difficult



WAP handwritten
to detect the digit
in this image



fail

Human brain
is extremely complex

Representation - ML vs DL

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Logistic Regression

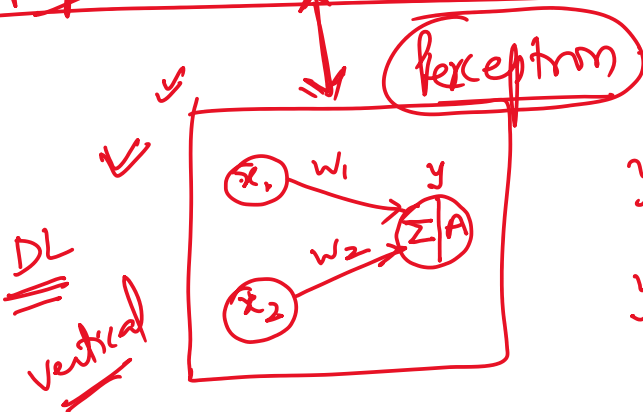
OLS Statistical

ML

<u>x_1</u>	<u>x_2</u>	<u>y</u>

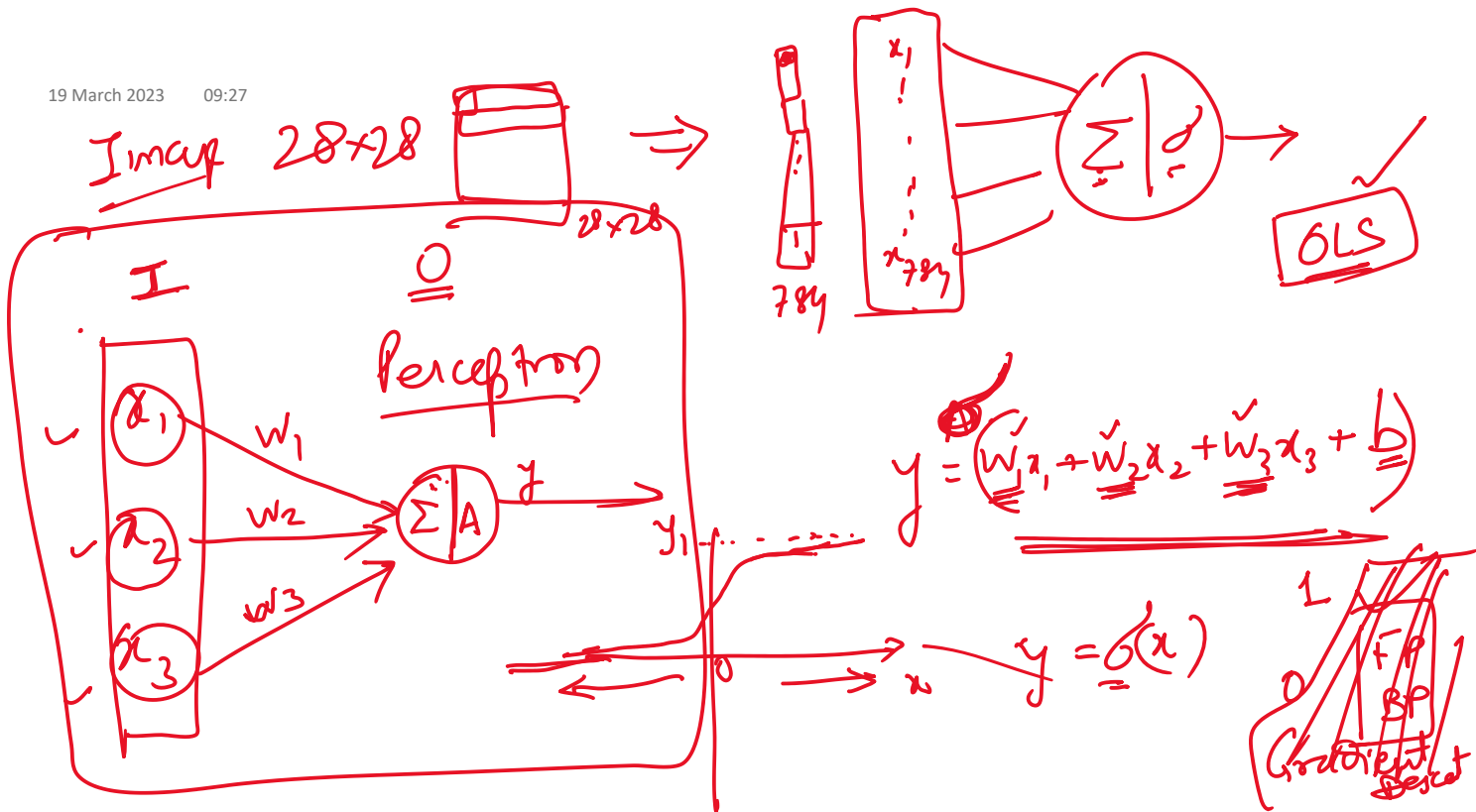
$$y = \sigma(m_1 x_1 + m_2 x_2 + c)$$

horizontal

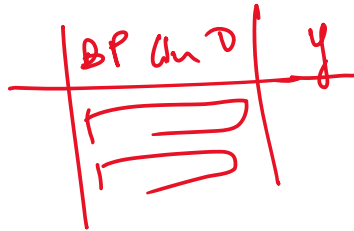


$$y = w_1 x_1 + w_2 x_2 + b$$

$$y = \sigma(w_1 x_1 + w_2 x_2 + b)$$



Perceptron ?

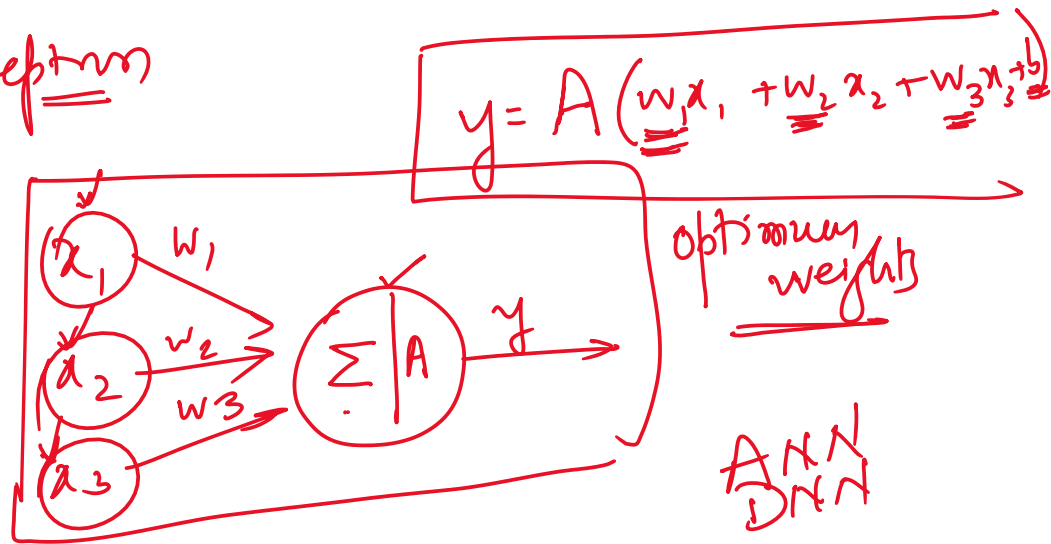


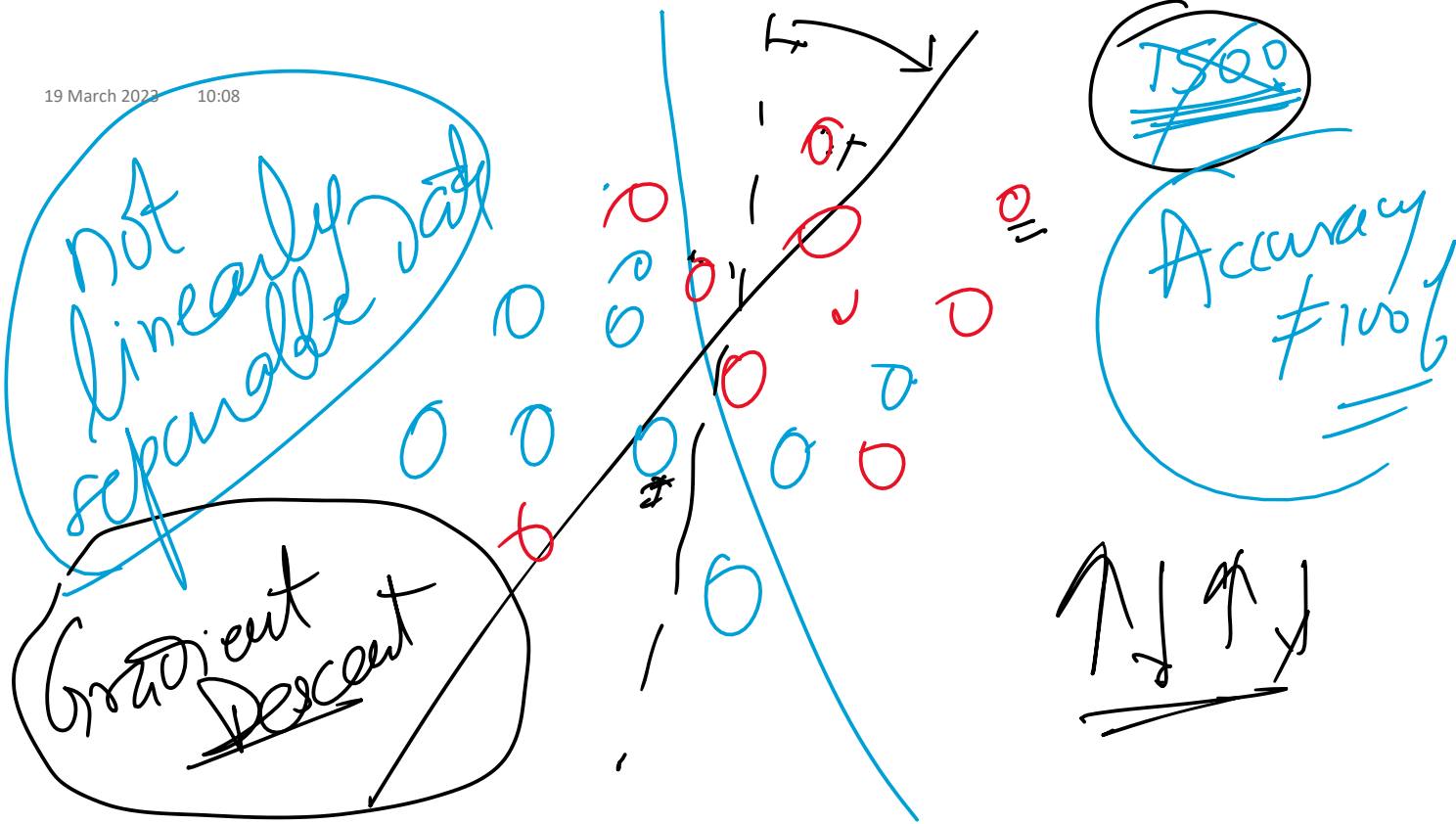
Deep Neural Network

SLP

Single Layer Perceptron

Neural Network







→ What is DL (bas.)

→ Perceptron ^{Simplest} ~~DNN~~ ~~ANN~~

→ Optimization
algs.

→ Gradient Descent } after break

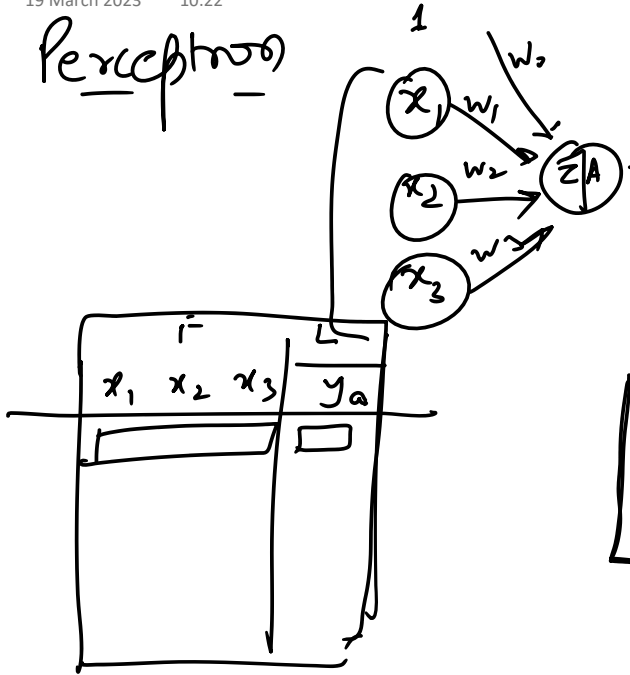
→ Use Cases

OLS {
Assumptions}
Perception Learning Algo th

Gradient Descent

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Perceptron



$$y = w_1 x_1 + w_2 x_2 + w_3 x_3 + w_0$$

Steps

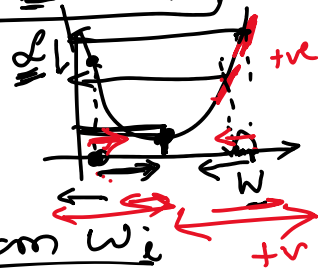
① Start with random w_i

② Calc. y_p

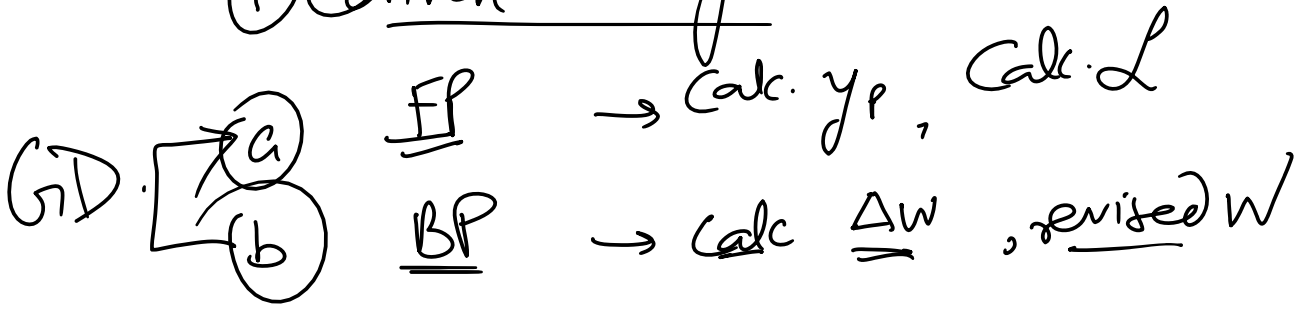
$$\text{Calc. } L = f(y_a, y_p)$$

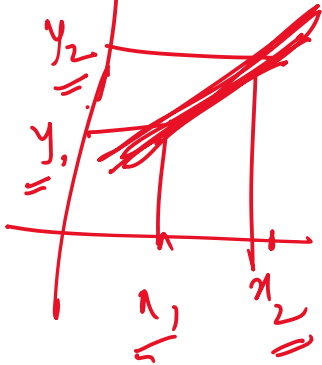
Choose a Loss f. which is Convex

③ $w_i = \underline{w_i - \Delta w_i}$ $\frac{\partial L}{\partial w_i}$

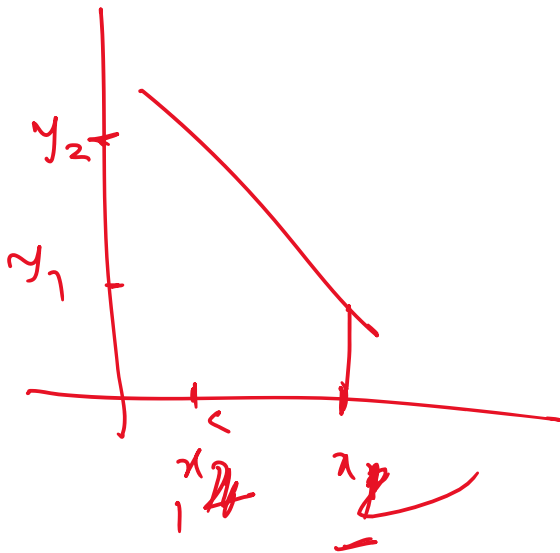


① Convex Loss f.

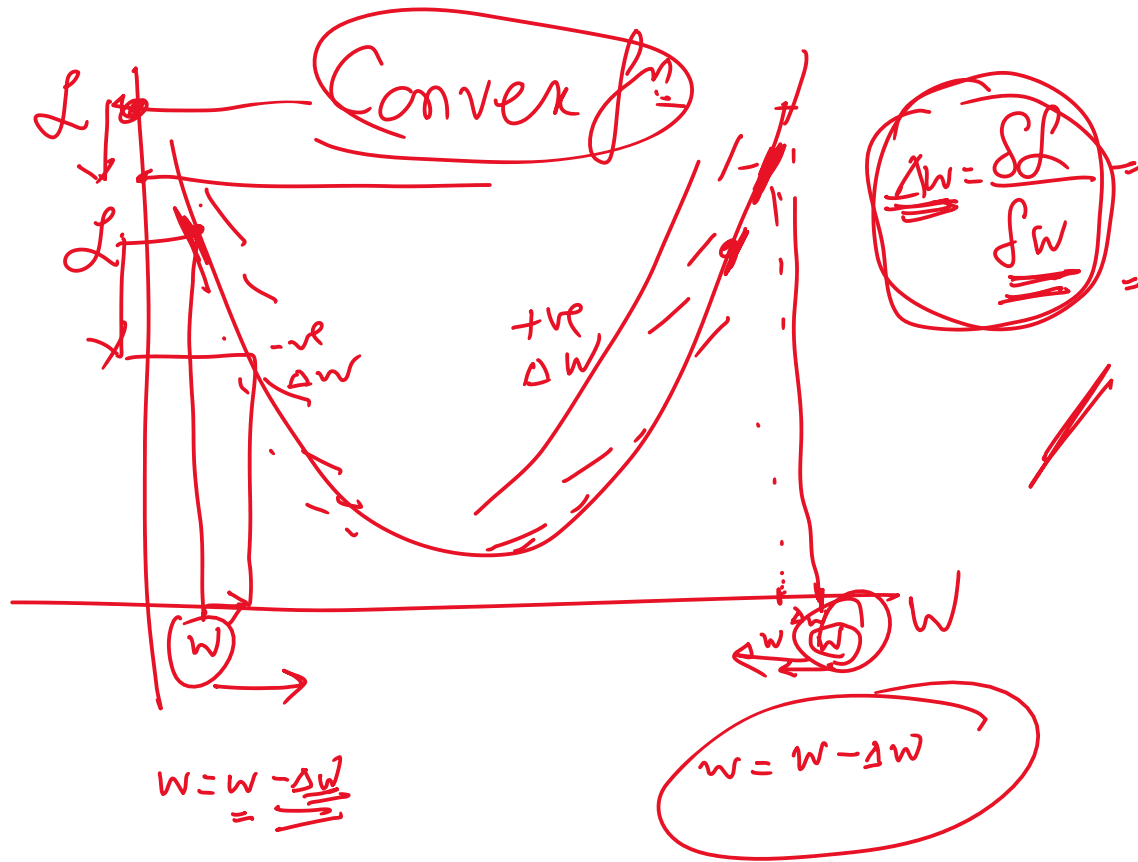


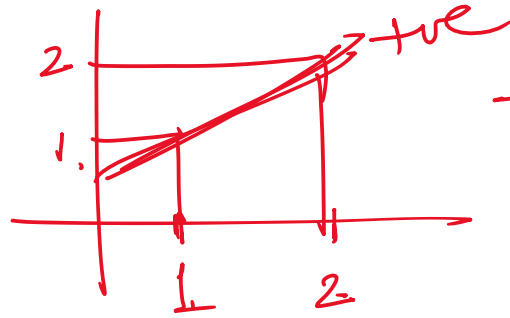
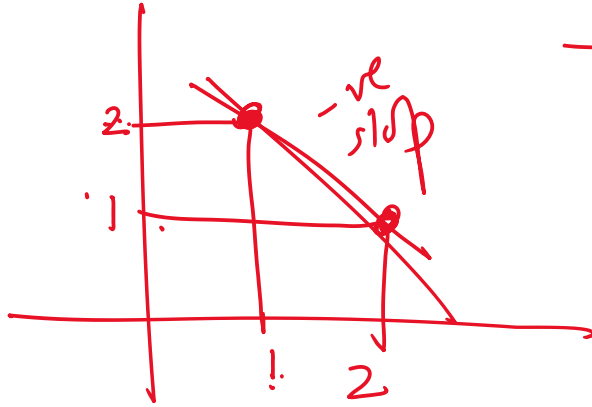


$$\frac{y_2 - y_1}{x_2 - x_1} = \underline{\underline{+ve}}$$



$$\frac{y_2 - y_1}{x_2 - x_1}$$





$$\frac{2-1}{2-1} = 1$$

$$\frac{2-1}{1-2} = \frac{1}{-1} = -1$$