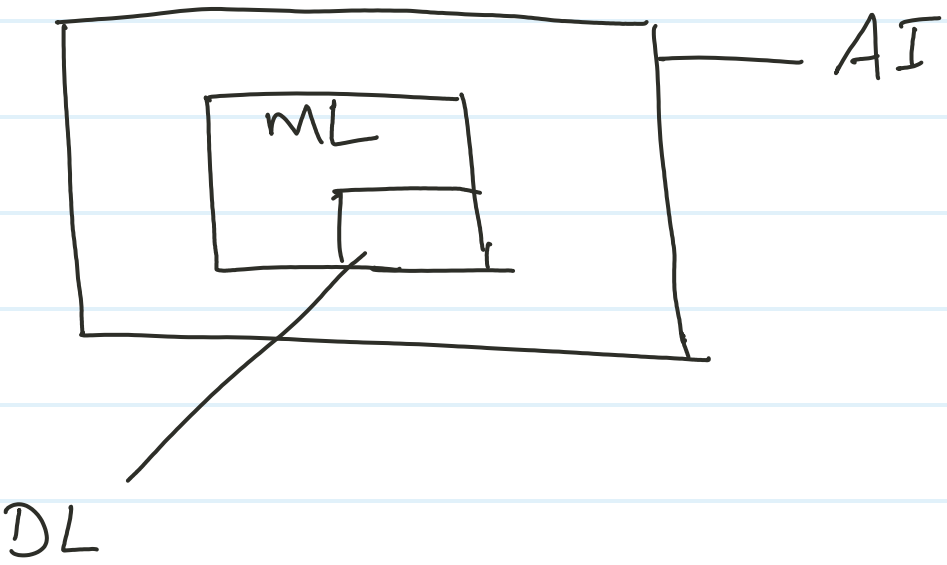
Deep learning



2005 - Orkut / Facebook 100 TB

2008 - Android 1000TB

2011 - web App/user 100000 TB

exponential growth of data

Big Data

Hadoop / spark / Apache

store data in structure and unstructed form

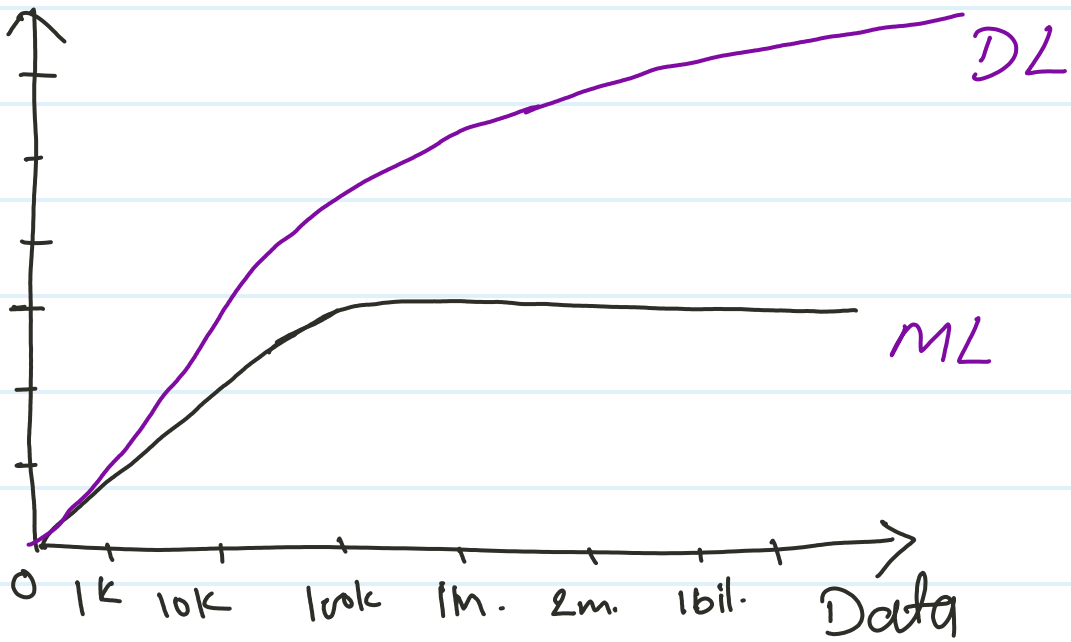
2015 - Data Science

↓

2020 - ML

↓

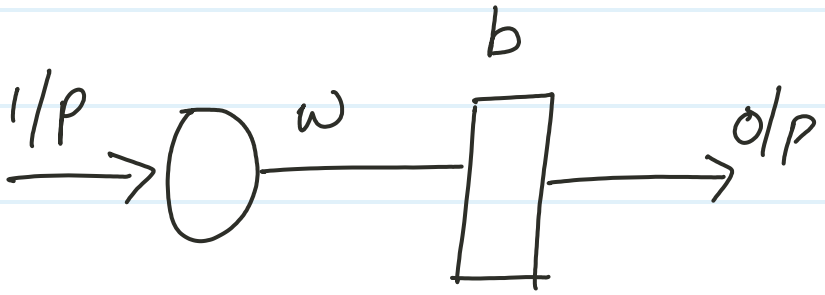
DL Why DL ?



Deep Learning - structure & construction

Neuron

exactly mimic the human brain



$$y = mx + c$$

Neural N/w = $xw + b$

① ANN (Artificial Neural N/w)

Regression / classification / clustering.

Data - structured data

② CNN – (convulutional Neural N/w)

CV (Computer vision)

Image classification / Video generate

Data- images / video frames

③ RNN (Reccuent Neural N/w)

NLP (Natural Language Processing)

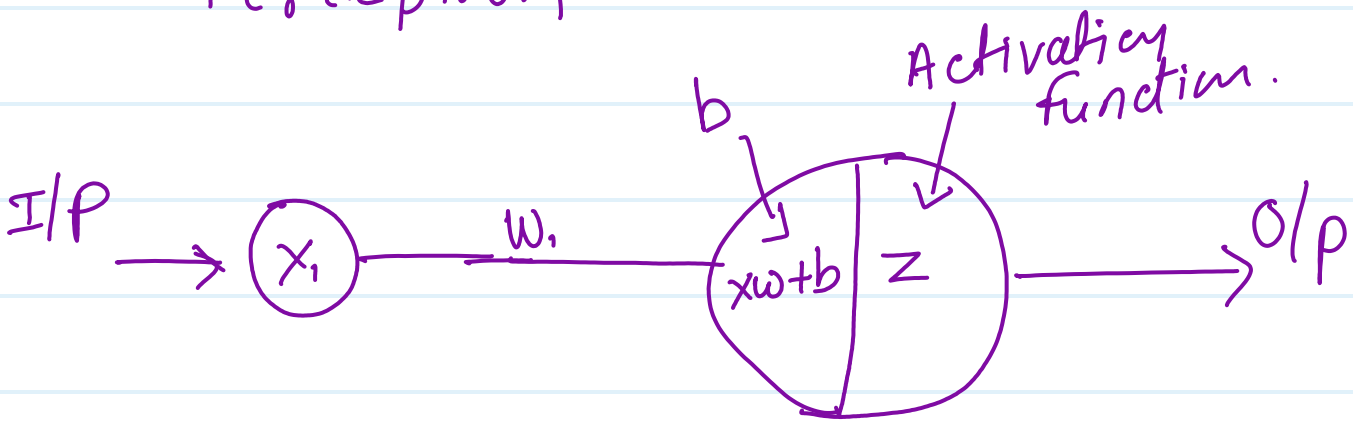
Text translation / Time series / voice translation

Data- Text / voice / wordfile / Time related data

Perceptron
weight
bais
Activation

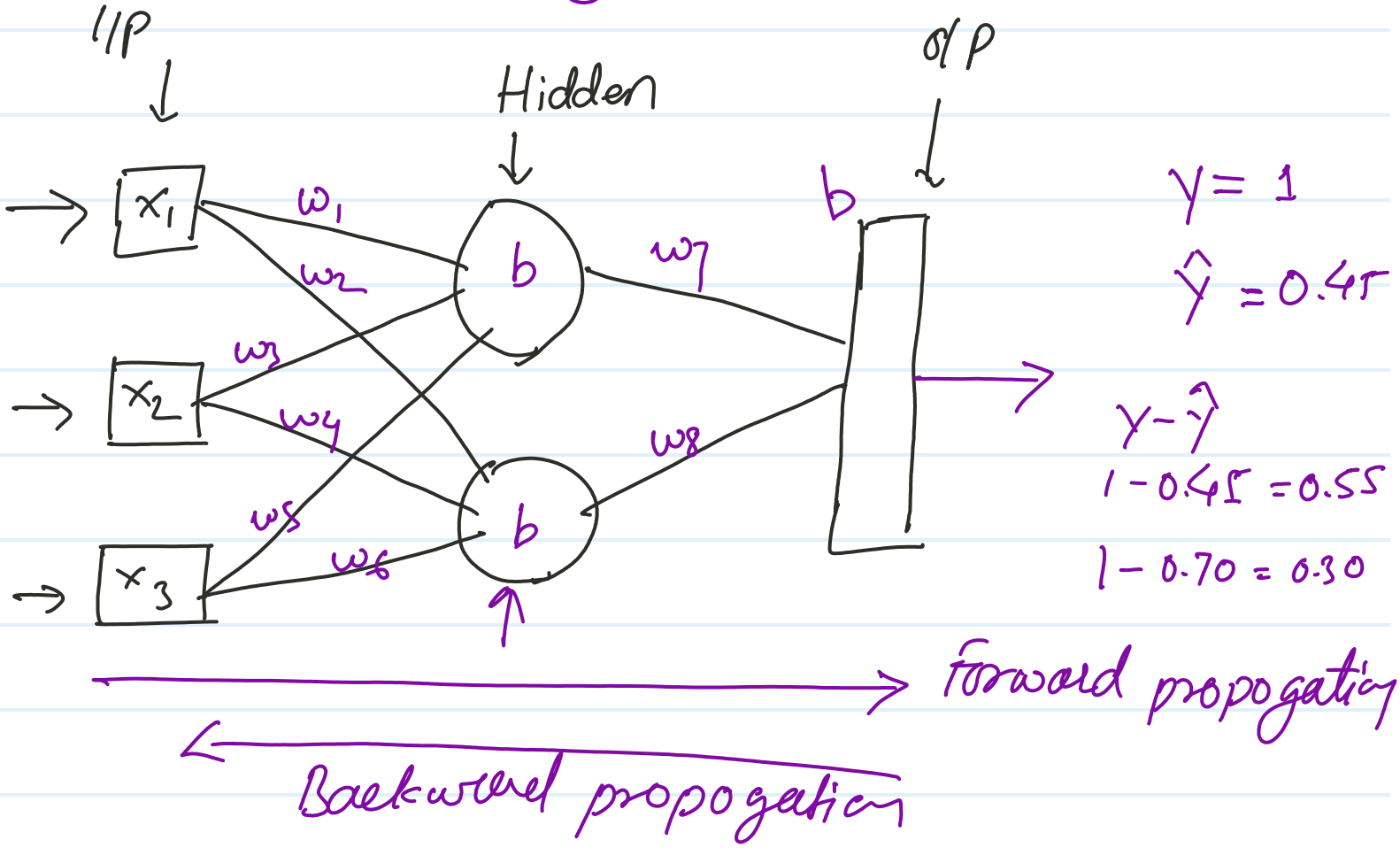
Forward propogation
backward propogation
Layer (I/P, O/P, hidden)
optimizer.

① Perceptron –



$$z = xw + b$$

$$\sigma = \frac{1}{1 + e^{-z}}$$



$$\theta_0 \theta_1 = \frac{\partial}{\partial x}$$

Linear Algebra -

scalar = 3, 5, 2

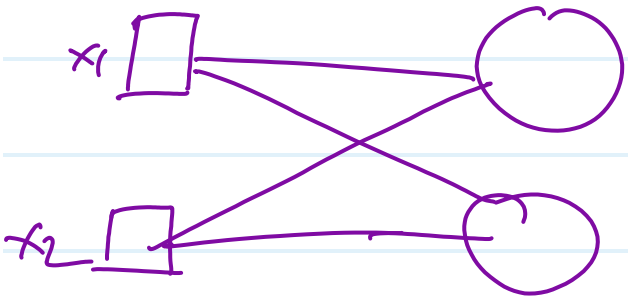
vector = $[2, 4, 3, 5]$

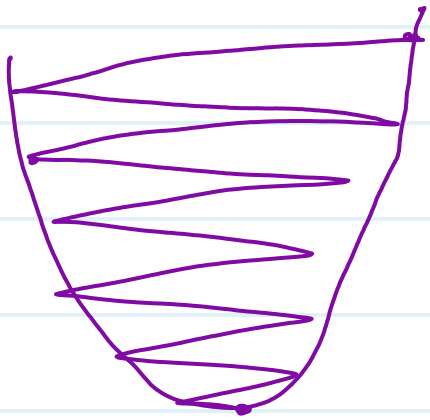
matrix

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$$

Identity matrix

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$





$$\left\| \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \begin{bmatrix} 2 \\ 1 \end{bmatrix} \begin{bmatrix} 3 \end{bmatrix} \right\|$$

$$y - \hat{y} = 0.001$$

$$2x_1 + x_3$$