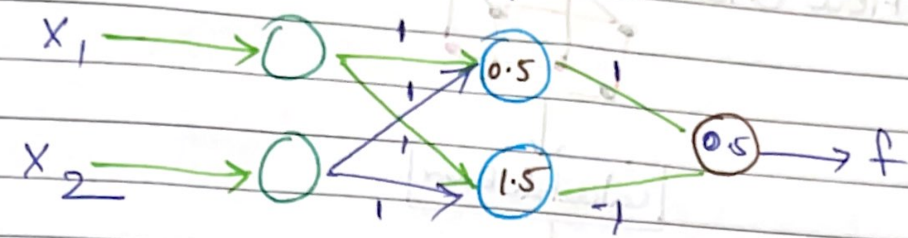
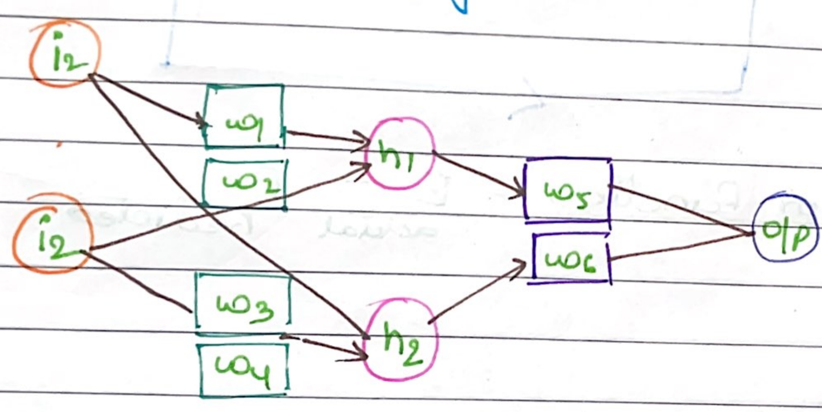
⇒ linear non-separable.



⇒ MLFFNN should be used

BACK PROPOGATION

→ Why Back Propogation



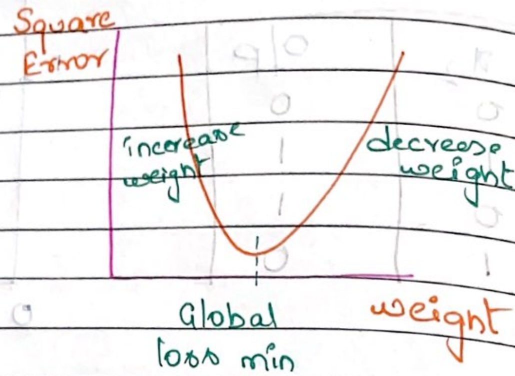
→ 1. The weights assigned will lead to correct o/p

2. Intialize weights

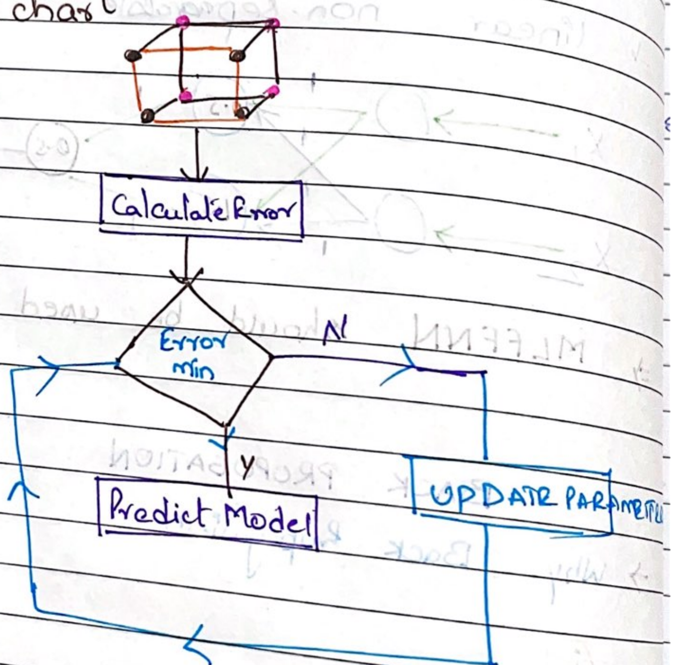
3. change parameters that error is min.

Error = $E_{real} - E_{Predicted}$

Gradient Descent :-



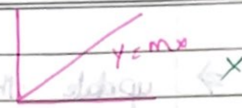
Flow chart



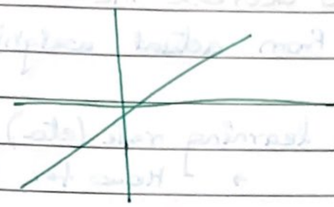
Error function = $E_{actual} - E_{Predicted}$

Why bias.

$\rightarrow y = w_1 * x + b$



y-intercept



$y = w_1 x + b$.

→ Diagram in PPT

Step 1 :-

Forward Pass.

$net\,h_1 = w_1 \times i_1 + w_2 \times i_2 + 1 \times b_1$
$= 0.3775$

$net\,h_2 = i_2 w_3 + i_2 \times w_4 + 1 \times b_1$

$\Rightarrow$ Squash = (o/p from 0 to 1)

$out\,h_1 = \dfrac{1}{1+e^{-(net\,h_1)}}$

Step 2

$\rightarrow \quad o_1 = h_1 \times w_5 + h_2 \times w_6 + b_2$

$o_2 = h_1 \times w_6 + h_2 \times w_7 + b_2$

$\Rightarrow \quad f(x) = \dfrac{1}{1+e^{-x}} = \dfrac{e^x}{1+e^x}$

$$\frac{d}{dx} f(x) = \frac{e^x \cdot (1+e^x) - e^x \cdot e^x}{(1+e^x)^2} = \frac{e^x}{(1+e^x)^2} = f(x)(1-f(x))$$

DATE

⇒ update the weight
→ To decrease the error, Subtract this from actual weight

η : learning rate (eta)
→ How far to go?

Similar to supervised learning, a neural network can be used in a way to train on unlabeled data sets. This type of algorithms are categorized under unsupervised learning algorithms and are useful in a multitude of tasks such as clustering.

⇒ Unsupervised Learning.

Competitive Neural Network
→ form of unsupervised learning in ANN, nodes compete for the right to respond to the subset of input data
→ increasing the specialization of each node in the n/w.

Hebbian Learning is inspired by the biological neural weight adjustment mechanism. It describes the method to convert a neuron an inability to learn and enables it to develop cognition with response to external stimuli. These concepts are still the basis for neural learning today.

⇒ Hebbian Learning
→ Proposed by Donald Hebb

1. Neuron A is near B, fires or excites B, metabolic changes happen both in A and B, (A efficiency in B increases)
2. If A and B are simultaneous excited (Synaptic strength increases)
3. If A and B are activated unsynchronised, (strength of synapse decreases)

VISION

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1. metabolic changes (efficiency in B increases)
2. simultanous excited (synaptic strength increases)
3. activated unsynchronised (strength of synapse decreases)