Multi-Layer Perceptron (MLP)

* MLP :-

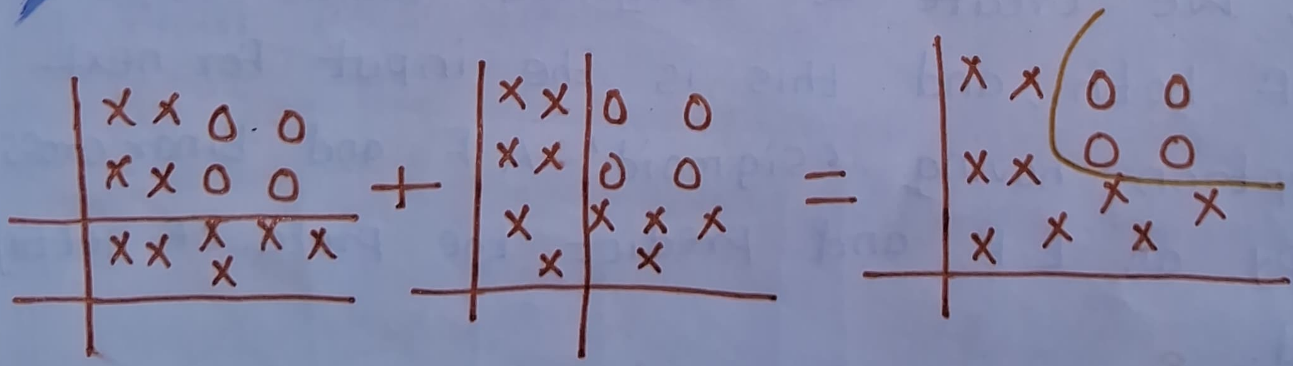
MLP is created by connecting multiple perceptron together to form a larger Neural Network.

MLPs are mostly used for tabular data but we can use it also for grid structure data (eg. images) but it works best with tabular data.

* Visual Intution :-

Imagine two individual perceptrons, each drawing a different decision boundary.

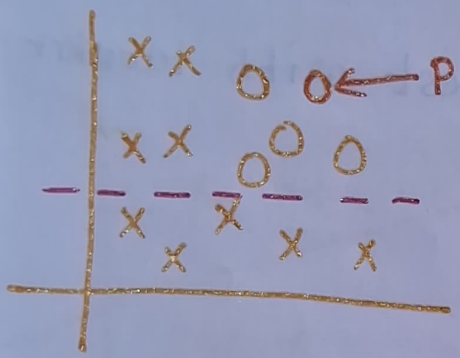
If you Superimpose (combine) these lines and apply smoothing you can capture Non-linear relationships.



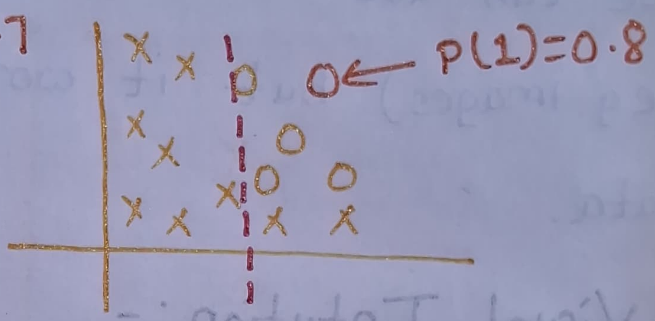
By combining enough Perceptrons Neural Network can approximate any function allowing it to create any kind of non-linear decision boundary.

* How it works :-

Suppose we are solving 'B Probabilistic Binary classification' Problem with two different perceptron models as shown in fig. We have to find proba. of getting placed of shown point.



Perceptron 1



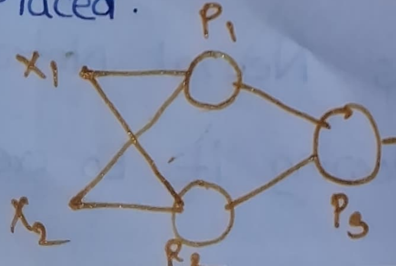
Perceptron 2

So,

Perceptron 1 → P(getting placed i.e 1) = 0.7

Perceptron 2 → P(getting placed i.e 1) = 0.8

Now, We create a weighted linear combination of both, and this is the input for next Perceptron having 'sigmoid' A.F and binar cross entropy as L.F. and predict the proba. of getting placed.



output = 0.82 (suppose)

* Network Architecture :-

① Input Layer :- These are the features from the data. They just pass information to next layer.

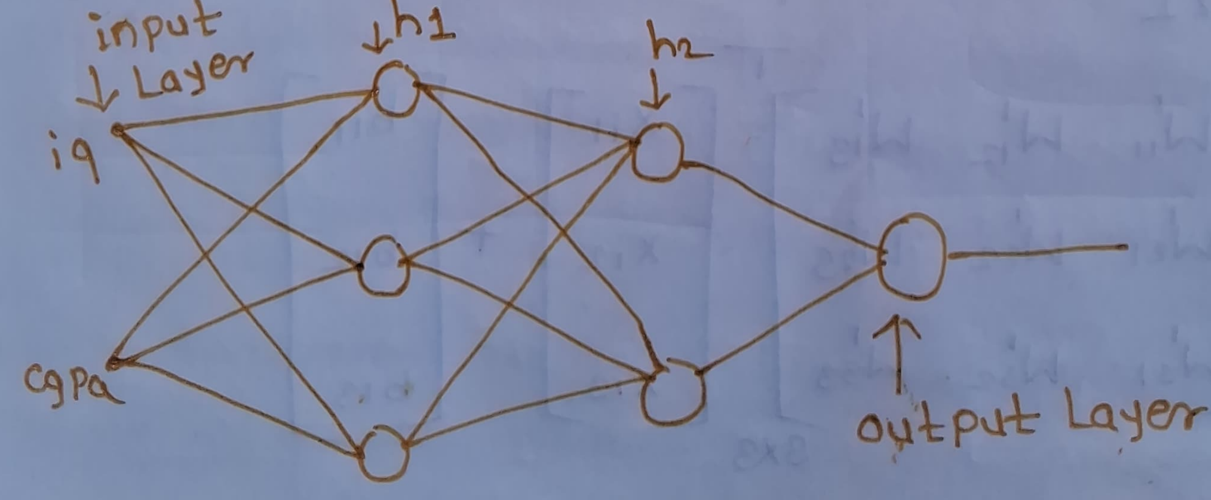
So, No processing and calculations happens here.

eg: IQ, CGPA etc.

② Hidden Layers :- These nodes are individual Perceptrons (varients), they take input process them and Pass output forward.

We call it 'hidden' because it sits between input and output layer.

③ Output Layer :- These layer recives the processed information from hidden layer to generate output or final prediction.


input
Layer
iq
cgPa
h1
h2
output Layer