Deep Learning

Replacing an expert with a system then it is ML

cancer detection

Loan approval

decent amount of data

Less Computation

Replacing a common human being activity with a system then it is a deep learning

Driving Car

Image Detection -

Language Translation

Voice Recognition

Text classification

Deep Fake

Humungous amount of data to get better result

High Computation

MS 800 — 27 km / litre — Ferari

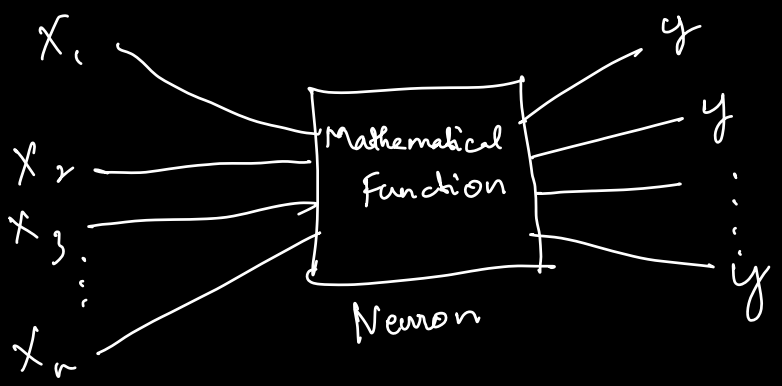
Understanding ML

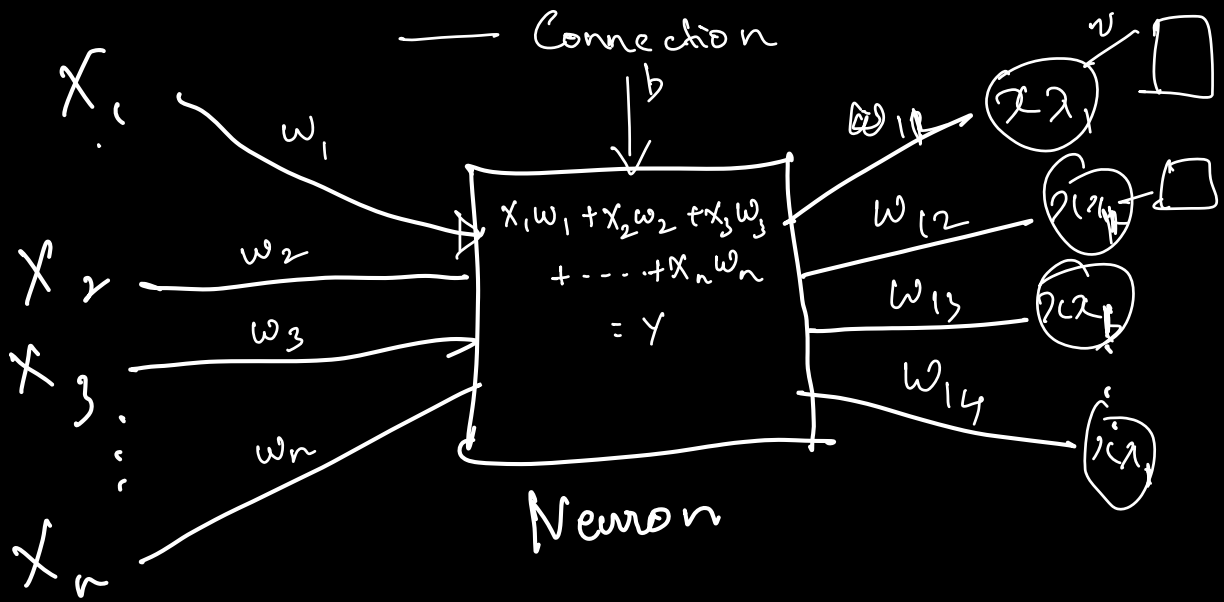
Feature Selection ⟷ experts

DL → No Feature Selection

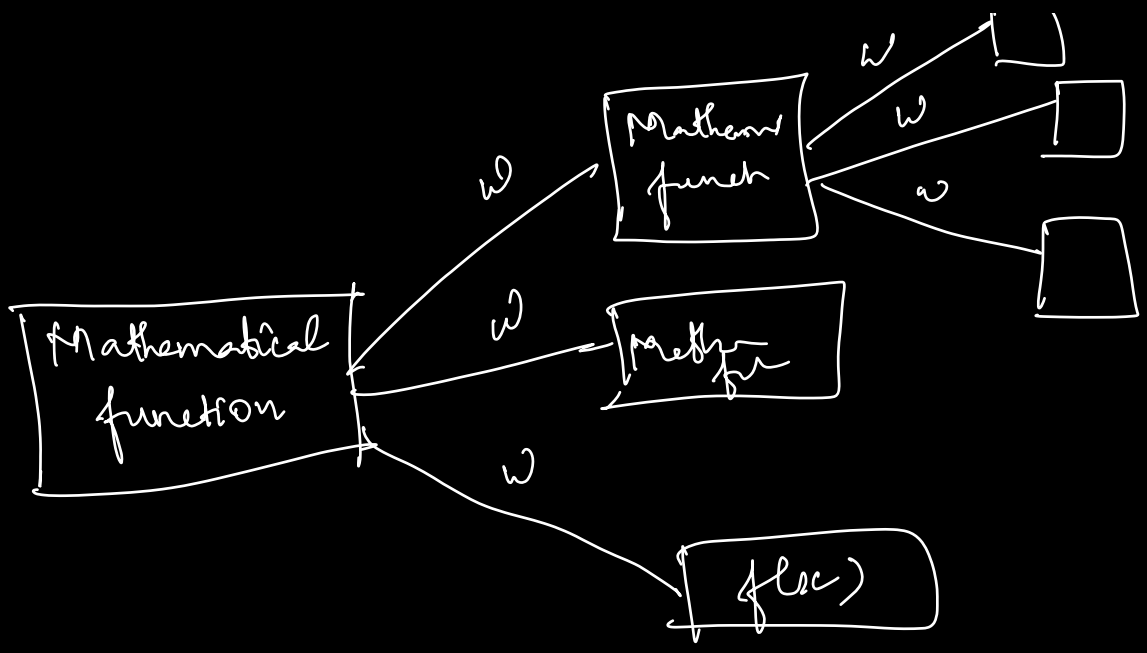
Artificial Intelligence	Deep learning	Neural Networks	Neurons
giving the intelligence to the system Artificially That can be done by DL	Algorithm that learns what feature matters and implements the way human brain works	Common Class of deep learning algorithm which is built using neurons	basic building block of Neural Network which can basically 'Learn'

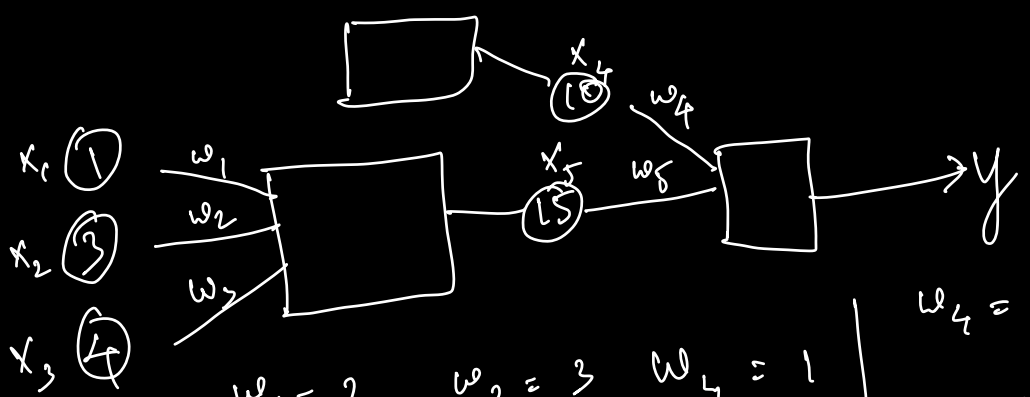
Single Neuron





$y = \underbrace{mx}_{\text{param}} + \underbrace{c}_{}$





$w_1 = 2 \quad w_2 = 3 \quad w_4 = 1$

$= 1*2 + 3*3 + 4*1$

$= 2 + 9 + 4$

$= 15$

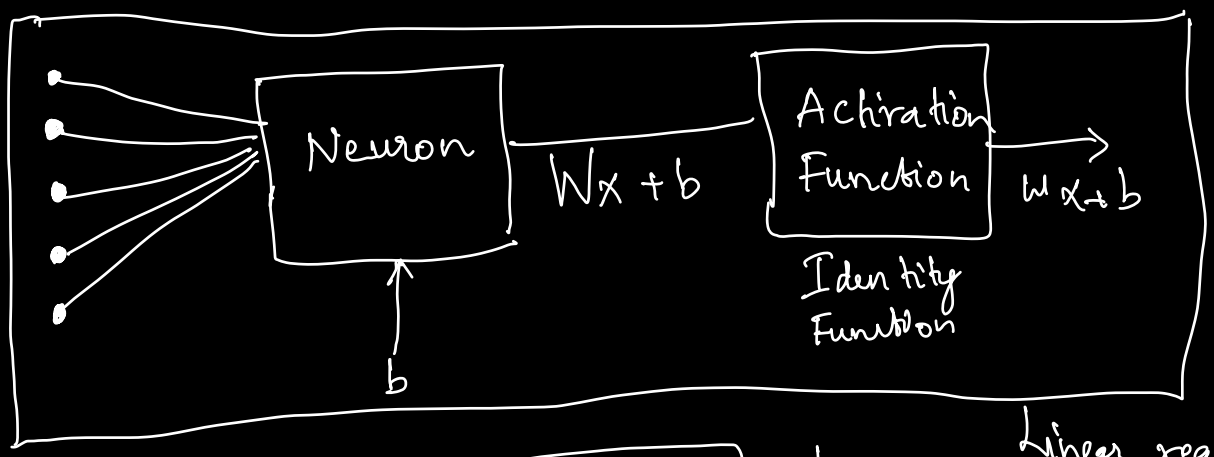
$w_4 = 1 \quad w_2 = 2$

$y = 10*1 + 15*2$

$= 10 + 30$

$= 40$

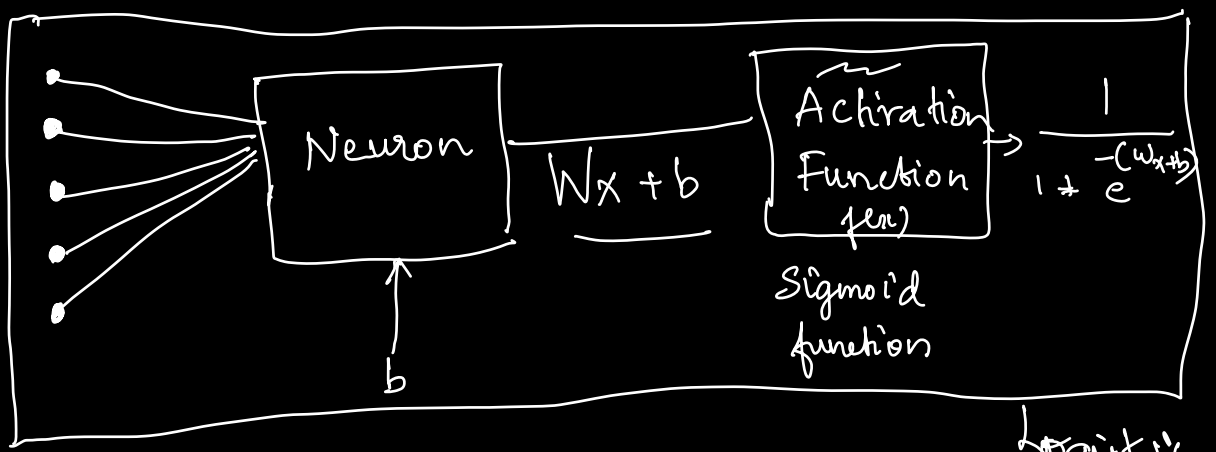
$y = x_1 w_1 + x_2 w_2 + x_3 w_3 + b$ (bias = 1)



Linear regression

$w_1 x_1 + w_2 x_2 + w_3 x_3 + b$

$(Wx) + b$

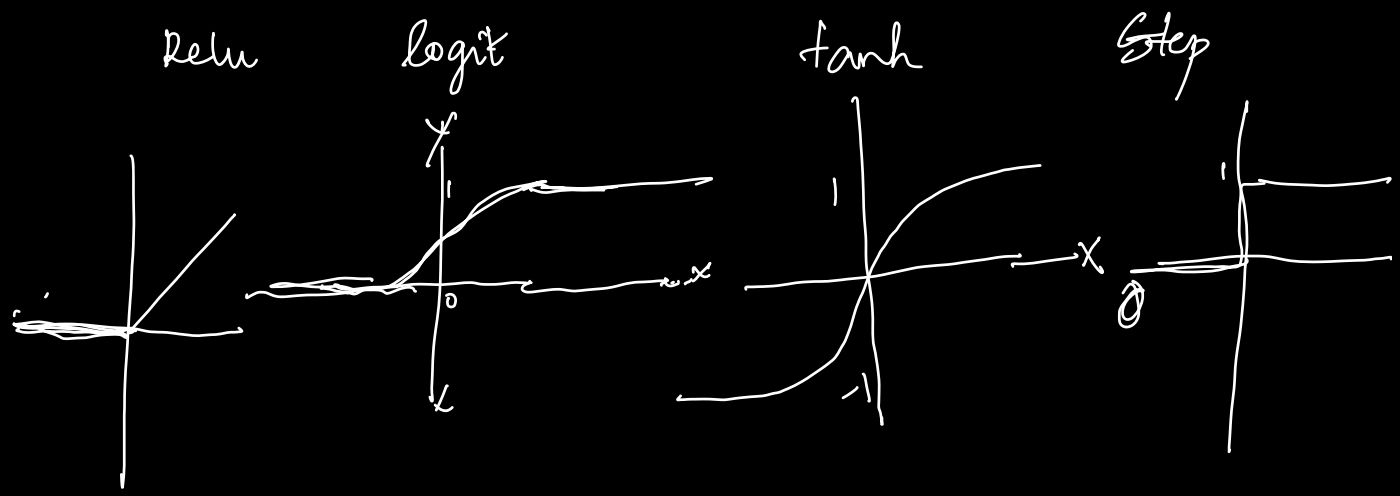


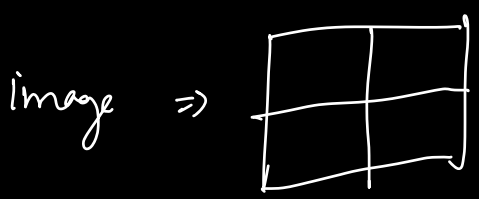
Logistic Regression

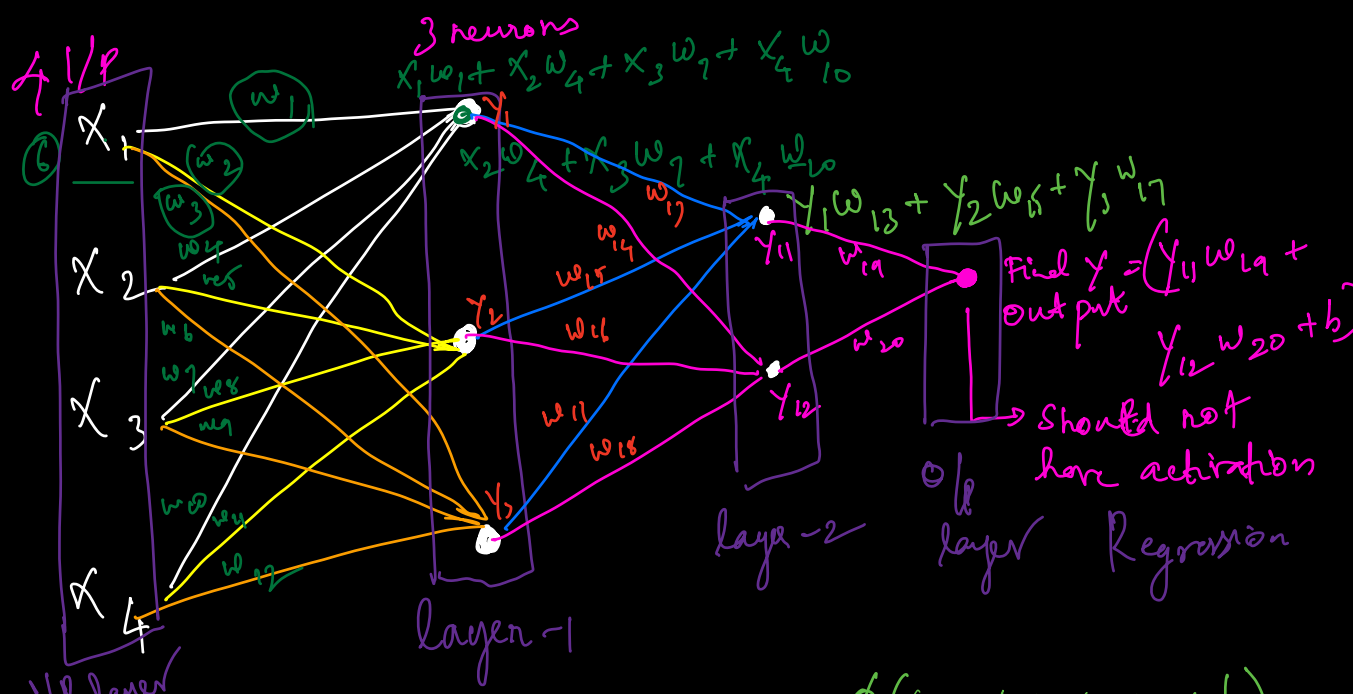
$$\text{Sigmoid function} = \frac{1}{1 + e^{-(z)}}$$

≈

Softmax Function → P(y=1), P(y=0)





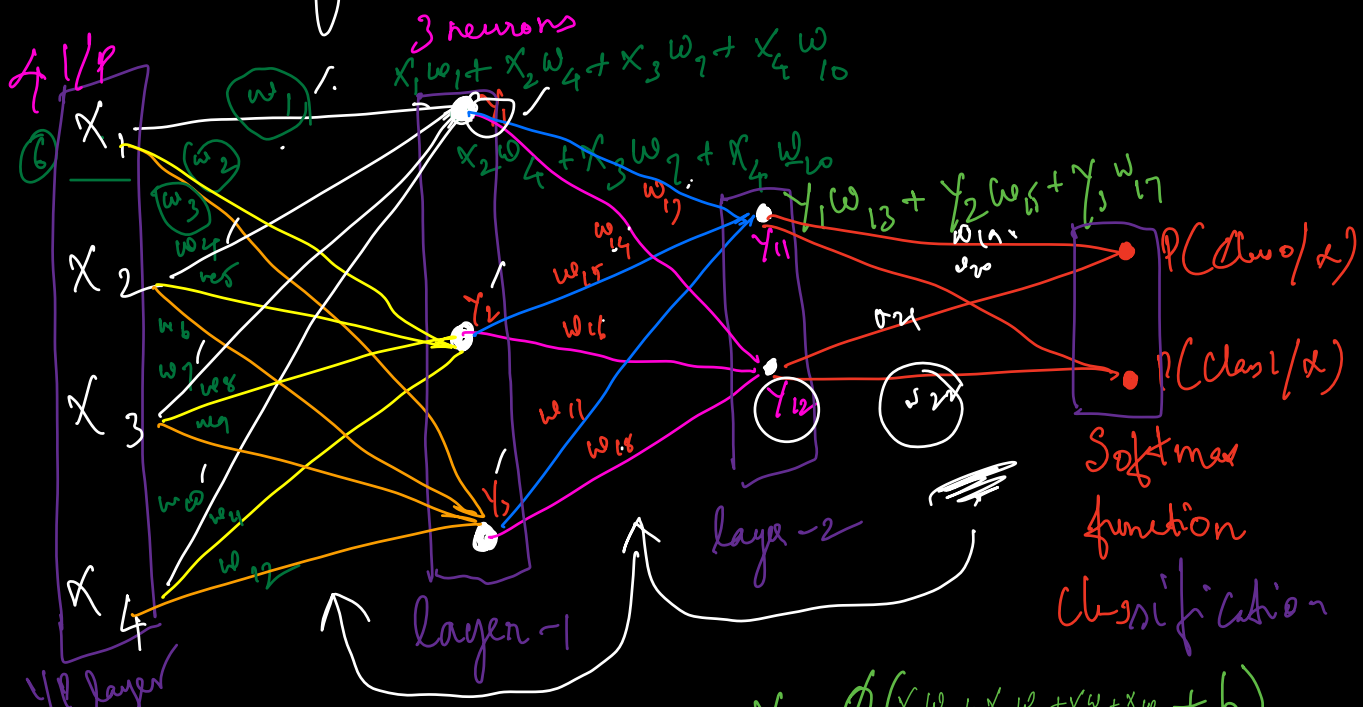


Connection = $4 \times 3 = 12$

Weights = 12 Weights + 3 bias

$y_1 = \phi(x_1w_1 + x_2w_5 + x_3w_8 + x_4w_{11} + b)$

Classification (Binary)



Connection = 4×3 = 12

Weigths = 12 Weights

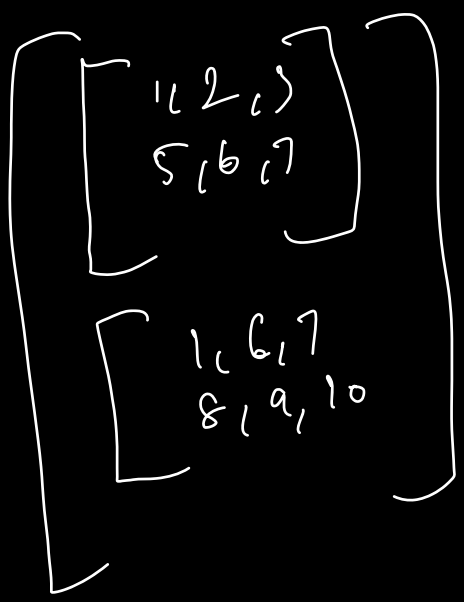
$$Y_1 = \phi(x_1w_1 + x_2w_4 + x_3w_7 + x_4w_{10} + b)$$

Tensorflow

1 ⇒ Scalar

[1, 2, 3] ⇒ Vector

[[1, 2, 3]
[5, 6, 7]] ⇒ Matrix



⇒ Tensor

Back Propagation