Deep learning

$y = f(x) + \varepsilon$

ML

Reg

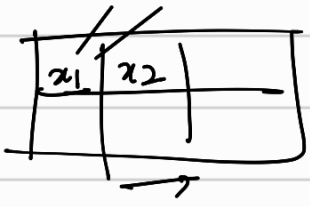
Class.

LR, LR ← Parametric models

DT, RF, Xgboost ← Non-parametric

Process

$y \sim f(x)$

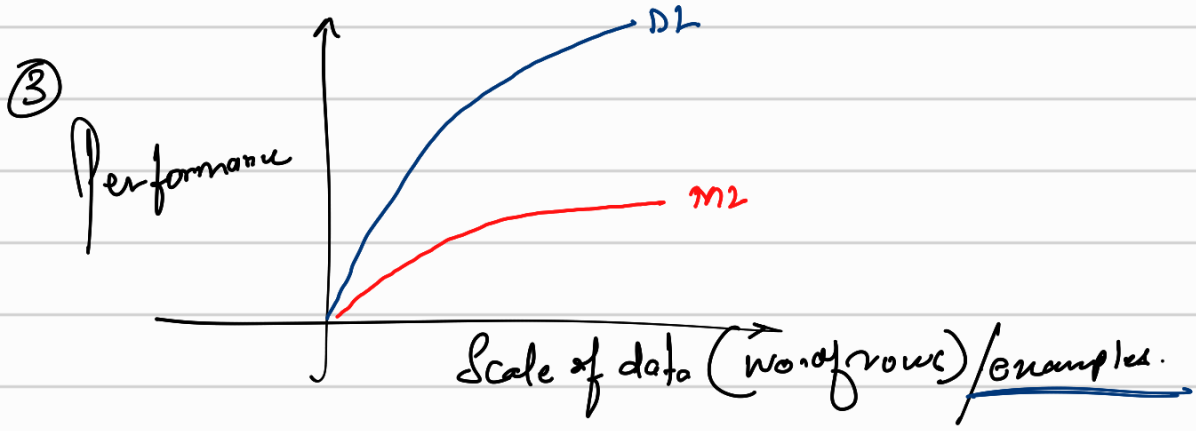


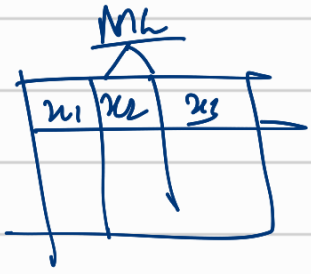
① $x \rightarrow$ (video, audio, text, tabular data, graph).

architecture

multimodality

② Tabular data, text, Scan → model → Diagnosis



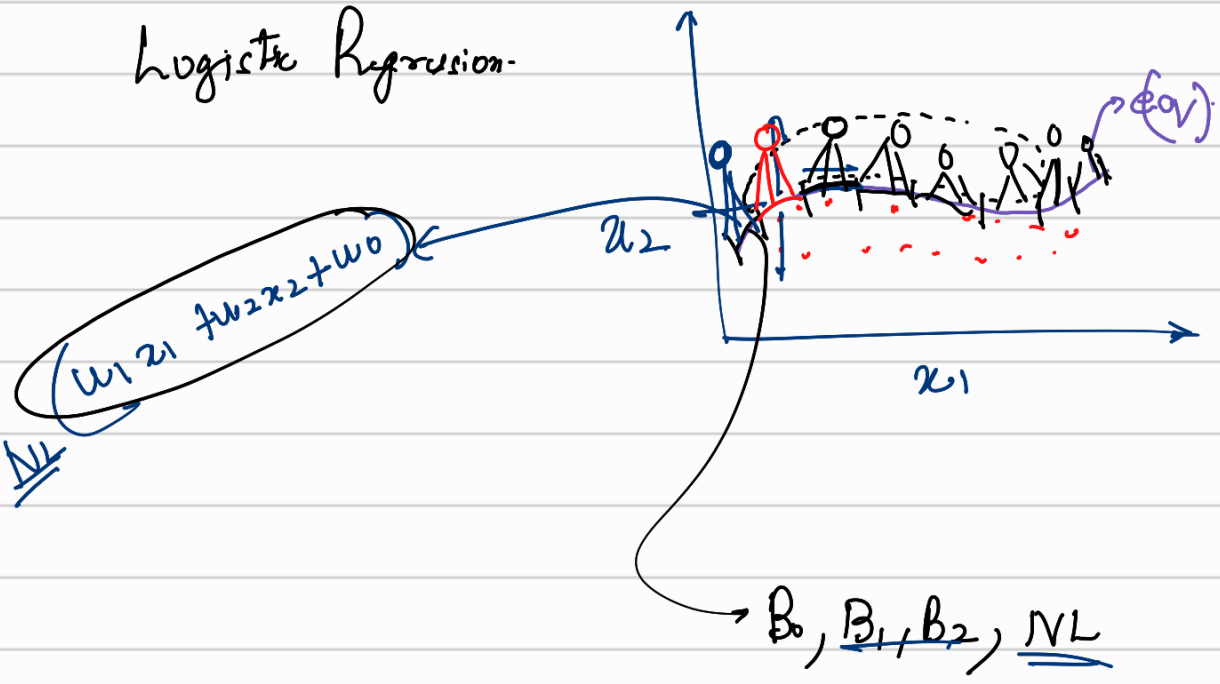


DL → automated feature engineering

DL

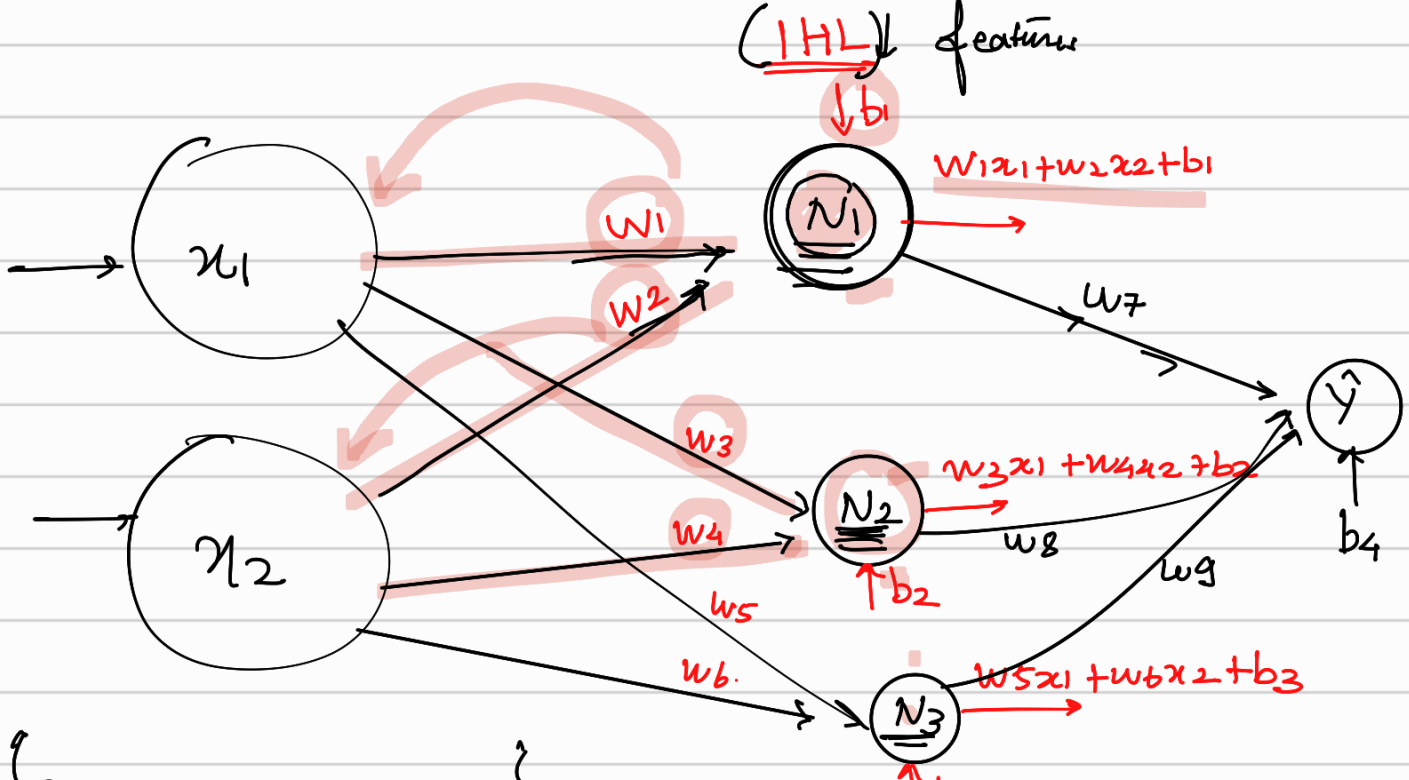
What is a Neuron

Logistic Regression.



B_0, B_1, B_2, NL

x_1	x_2	y



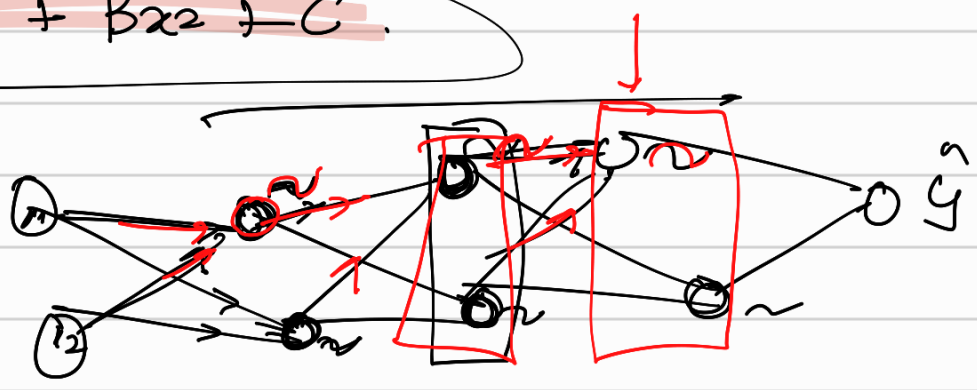
$N_1 = (w_1x_1 + w_2x_2 + b_1)$, $N_2 = (w_3x_1 + w_4x_2 + b_2)$ $N_3 = (w_5x_1 + w_6x_2 + b_3)$

$$\hat{y} = w_7N_1 + w_8N_2 + w_9N_3 + b_4$$

$$\Rightarrow \hat{y} = w_7(w_1x_1 + w_2x_2 + b_1) + w_8(w_3x_1 + w_4x_2 + b_2) + w_9(w_5x_1 + w_6x_2 + b_3) + b_4$$

$$\Rightarrow \hat{y} = x_1(w_7w_1 + w_8w_3 + w_9w_5) + x_2(w_7w_2 + w_8w_4 + w_9w_6) + w_7b_1 + w_8b_2 + w_9b_3 + b_4$$

$$\Rightarrow \hat{y} = Ax_1 + Bx_2 + C$$




1 HL
nth HL

Gradient Descent : minimise the loss by updating the W, B. for all neurons.

Random