Learning Mechanism

Deep
Learning
(Neural
Network
Architecture)

$\Biggl\{$

① feedforward Propagation ✔

② Loss Calculation ✔

③ Backward Propagation & optimisation ✔

$$\text{CGPA} \xrightarrow{x_1} \bigcirc \quad w_{11} \quad \overset{h_1}{\bigcirc} \quad w_1' \quad \text{non-linearity}$$

w_{12} w_{13} $\overset{h_2}{\bigcirc}$ w_2' $\widehat{y}$

w_{21} w_{22} z $f(z)$

$$\text{IQ} \xrightarrow{x_2} \bigcirc \quad w_{23} \quad \overset{h_3}{\bigcirc} \quad w_3'$$

$$\downarrow\downarrow \ (y_i - \hat{y}_i)^2$$

update
weights

$$\text{feedforward} \Rightarrow \sum_{i=1}^{n} x_i w_{ij}$$

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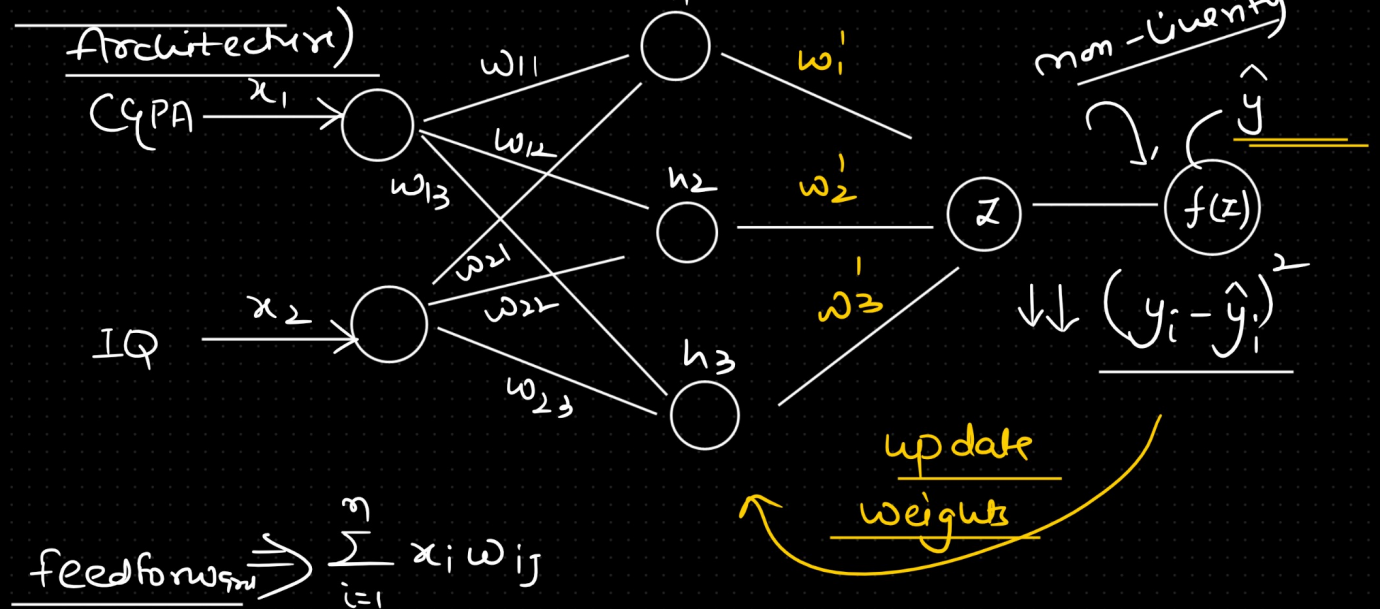
Regression $\longrightarrow$ MSE

Classification $\longrightarrow$ binary / categorical

cross entropy

GANs   Autoencoder

Customised Loss function

Optimisers $\longrightarrow$ Optimise the weight

$\quad\quad\quad\downarrow$ Gradient Descent $\quad$ & bias

$\quad\quad\quad\quad$ (ML Portion) $\quad\quad\quad\quad$ Parameters

$\quad\quad\quad\quad\quad\quad\quad\quad\downarrow$ Linear

$\quad\quad\quad\quad\quad\quad\quad\quad\quad$ Regression

Error ≈ 0

Local/global

minime

$$\approx 0.001$$

$$W_{new} = W_{old} - \eta \cdot \frac{\delta L}{\delta w}$$
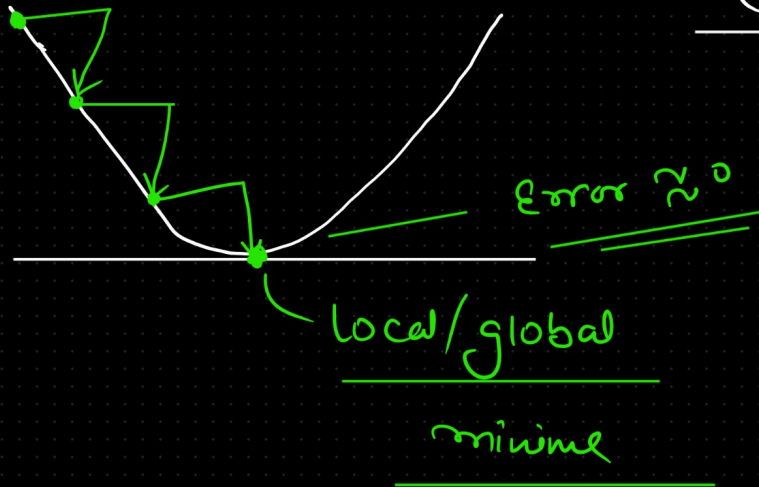
$\quad\quad\quad\quad\quad\quad\quad\quad\quad$ step size

$\left\{ \begin{array}{l} \text{Learning} \\ \text{Rate} \end{array} \right.$

hyperparameter

η