

Ex: 6.

Implement gradient descent and back propagation in deep neural network

Aim :

To implement a gradient descent and back propagation in deep neural network

Objective

- * To understand gradient in an optimized method
- * To implement back propagation in deep neural network to update weights
- * To implement a simple neural network for classification task
- * To observe how loss decrease with iteration

Observation

- * Loss decreases as number of iterations
- * weight and bias adjust
- * Back propagation ensures errors are efficiently layered.

Output:

Epoch 0, Loss: 0.2558

Epoch 2000, Loss: 0.2454

Epoch 4000, Loss: 0.1532

Epoch 5000, Loss: 0.1336

Epoch 8000, Loss: 0.1267.

Final Predictions:-

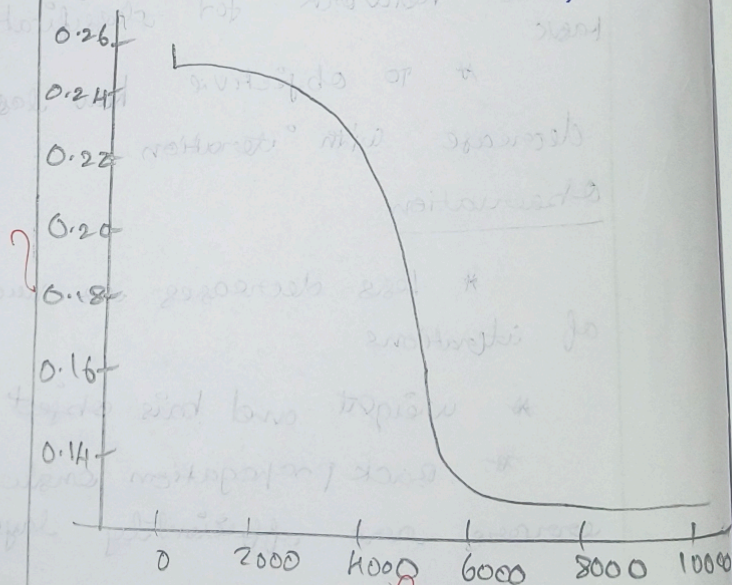
[0.05300868]

[0.49554213]

[0.95091319]

[0.50319882]

Loss curve. Gradient Descent
and Back Propagation



Pseudocode:-

Begin

Initialize weight and bias
For each in range (max-
epochs)
for each input sample

* Forward Pass

compute $Z = w \cdot x + b$

apply activation to get a

compute output prediction

* Compute loss

* $loss = cost(y_{true}, y_{pred})$

* Backward Pass

compute gradient due, db
using Chain