Exp-5 (study of Activation Func. & its role)

AIM:- To study the activation functions & its role.

Pseudocode: 1) Support necessary libraries
(numpy, tensorflow / keras, matplotlib)

2) Define different activation functions.
→ Sigmoid → Leaky RELU
→ Tanh. → SoftMax.
→ RELU

3) Visualize each function & its derivatives and input range.
→ Range of input values (x = -10 to 10)
→ Plot graphs

4) Build a given NN
→ MNIST classification

5) Train the network, multiple times, each of different activation.
→ Use same dataset, L.R & epochs
→ Record training loss & accuracy

6) Compare performances.
→ plot accuracy V/s activation function
→ plot loss V/s activation function.

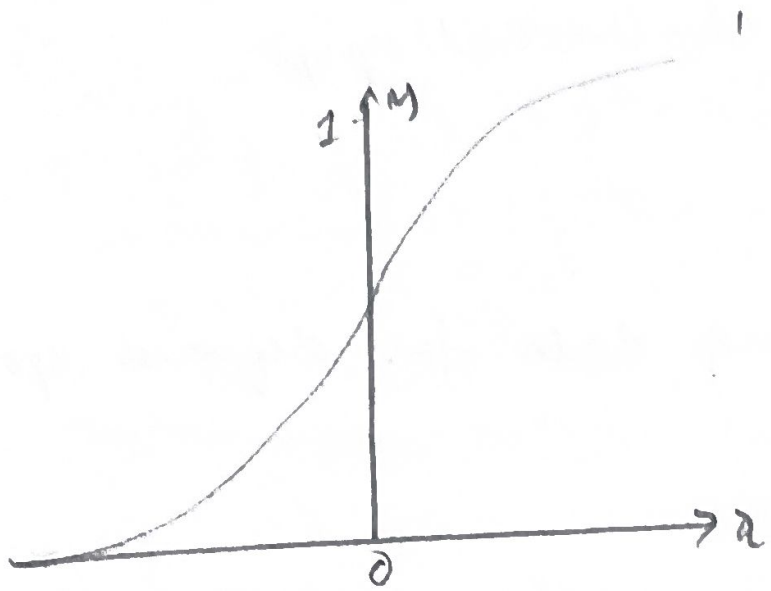
7) Compare results and conclude the role of the activation functions.

Observation: RELU :- $f(x) = \max(0, x)$

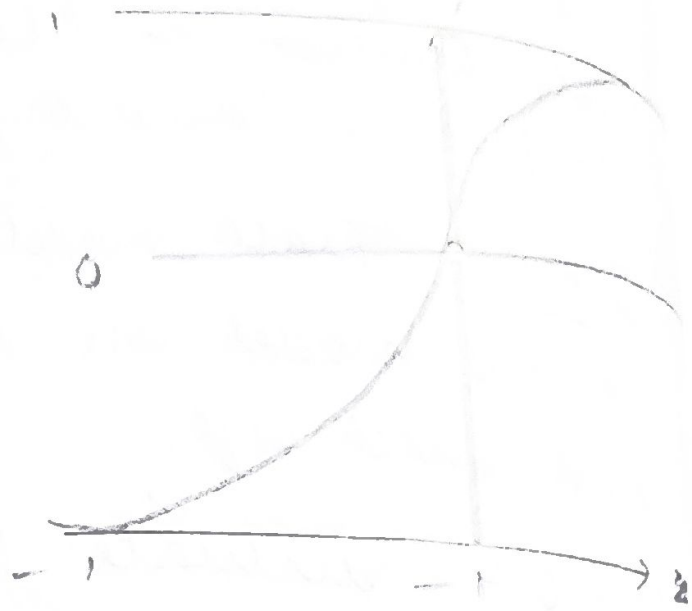
Leaky RELU :- $f(x) = \max(\alpha x, x)$

Sigmoid :- $f(x) = \frac{1}{(1+e^{-x})}$ [0, 1]

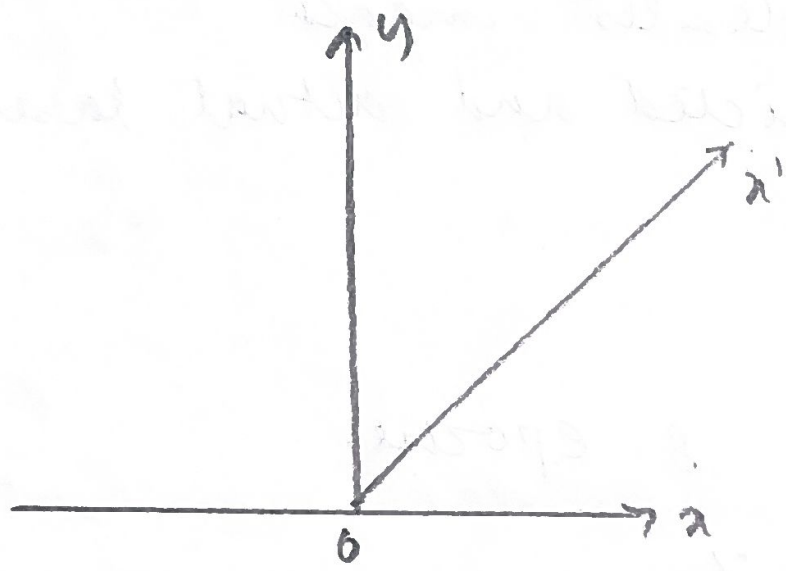
Tanh :- $f(x) = e^{x} - e^{-x} / (e^{x} + e^{-x})$ [-1, 1]



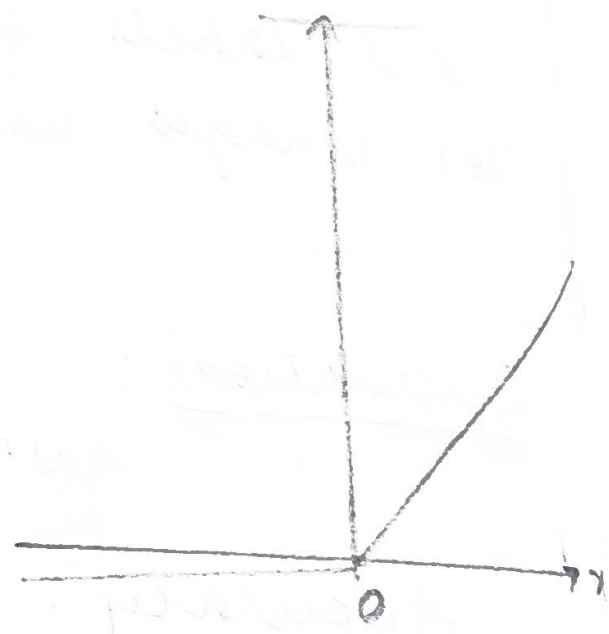
Sigmoid



Tanh



ReLU



Leaky ReLU

AI

Ps

2)

3)

4)

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