a-9-25

Exp-5 Study of Activation Function and its Role

AIM:
To study different activation function in neural network and understand their importance in learning by implementing them in pytorch.

Objective
1. To implement and compare activation function (sigmoid, ReLU, Tanh) using PyTorch
2. To analyze how each function transforms input values

Pseudocode
Start
1. Import torch library
2. Define input tensor with positive, negative, zero value
3. Apply Pytorch activation function.
   - torch.sigmoid()
   - torch.relu()
   - torch.tanh()
4. Display the transformed outputs?

END.

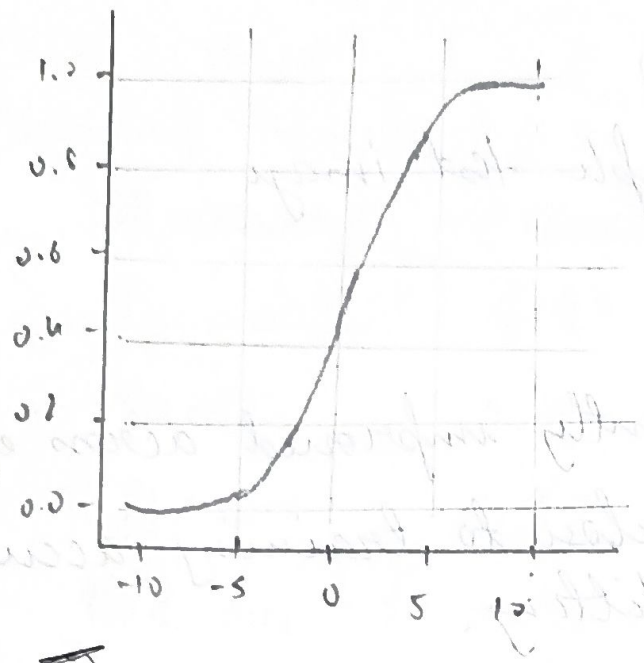
functions ?

Observation:
sigmoid: smooth, s-shaped, compresses values between 0
but gradients vanishes for large (n):
ReLU: Efficient, sparse, activation
tanh: similar to sigmoid but centered at 0.

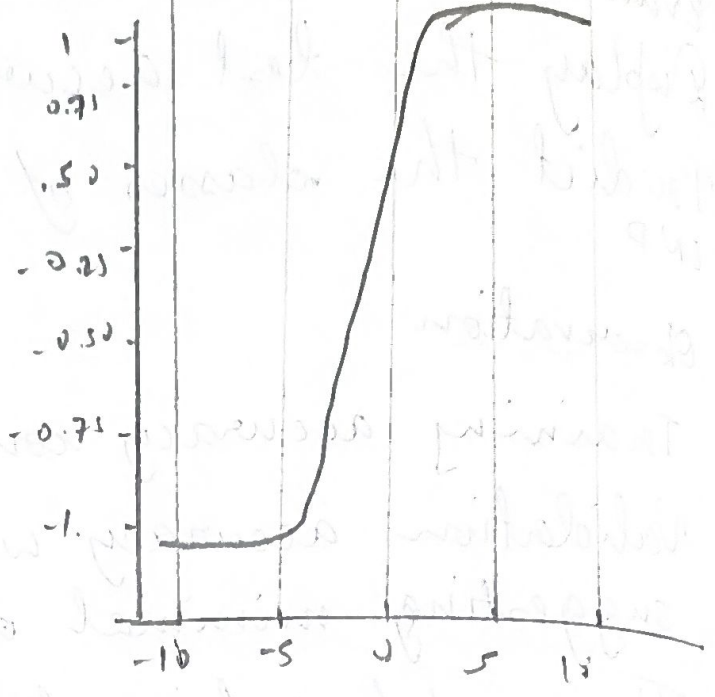
Result:
Implementation of activation function that are commonly used in deep learning was successfully done.

Output.

sigmoid Function



Tanh



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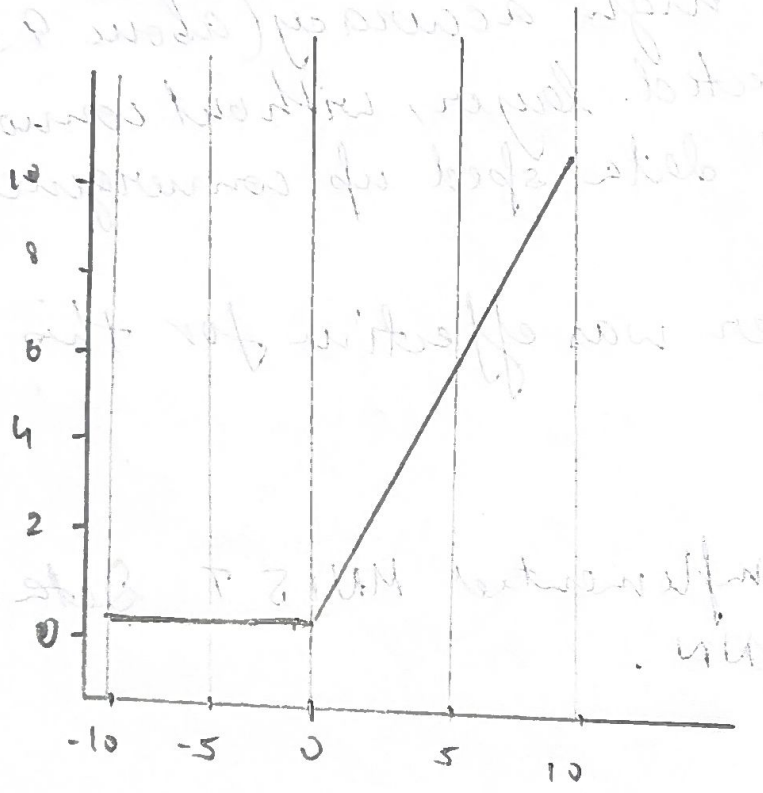
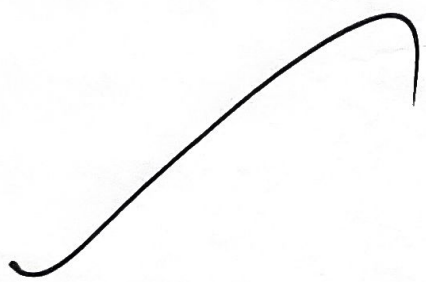


ReLU Function



o/p range ?

* sigmoid fun

$$\frac{1}{1+e^{-x}}$$

* tanh $= \frac{e^{x} - e^{-x}}{e^{x} + e^{-x}}$

* ReLU

$f(x) = \max(0, x)$