Assignment

Week 22

Step 6: Deep Learning (Week 22-25)

Week 22: Basics - Perceptron, Activation Functions, Forward + Backprop

- **Q1. Compute the Sigmoid, ReLU, and Tanh values for the array**
- **[-2, -1, 0, 1, 2].**
- **Q2. Calculate the weighted sum and Sigmoid activation for input**
- **[2,3] with weights [0.5,0.2] and bias 0.1.**
- **Q3. Implement a perceptron to simulate the AND gate.**
- **Q4. Compute the Mean Squared Error (MSE) for**
- **ytrue=[1,0,1,0] and ypred=[0.8,0.2,0.9,0.1].**
- **Q5. Perform one step of weight update for a single neuron using gradient descent (manual backprop).**
- **Q6. Plot the Sigmoid, ReLU, and Tanh functions for values from -5 to 5.**
- **Q7. Create a step activation function and test it on input**
- **[0.2, -0.3, 1.5, -2].**
- **Q8. Calculate the derivative of the Sigmoid function for input**
- **[0,1,2].**
- **Q9. Initialize random weights and biases for a single neuron with 3 inputs.**
- **Q10. Compute the output of a perceptron for OR gate using randomly initialized weights and a step activation function.**