CS561/571 - ARTIFICIAL INTELLIGENCE LAB

ASSIGNMENT-10: Neural Networks

(Read all the instructions carefully & adhere to them.)

Date: November 6, 2023 **Deadline: November 12, 2023**

Total Credit: 30

Instructions:

1. The assignment should be completed and uploaded by November 12, 2023, 11:59 PM IST.
2. Markings will be based on the correctness and soundness of the outputs. Marks will be deducted in case of plagiarism.
3. Proper indentation and appropriate comments are mandatory.
4. Make proper documentation of all results and observations with their analysis.
5. You should zip all the required files and name the zip file as roll_no_of_all_group_members .zip, e.g., 1501cs11_1201cs03_1621cs05.zip.
6. Upload your assignment (the zip file) in the following link: https://www.dropbox.com/request/KJwrOexjZ8VtpxPhIbvN
7. For any queries regarding this assignment, you can contact:
   Aizan Zafar (aizanzafar@gmail.com) or
   Gitanjali Kumari(gitanjali.singh228@gmail.com) or
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----------**Questions**----------

1. Design and implement an artificial neural network to simulate a 2-input XOR gate. Assign appropriate values to weights and thresholds to edges and nodes in the neural network.

   Note: Do **not** use any DL library (Keras, PyTorch, etc.) to implement the XOR gate

2. Go through the attached IRIS and CIFAR-10 datasets and design a Multi-Layer Perceptron (MLP) classifier. Train the feedforward networks using the given datasets

and show the evaluation in terms of precision, recall, f-score, and accuracy. Experiment with the number of neurons in the hidden layer and plot an accuracy v/s number of neurons graph.
For both datasets, use ReLU and leaky ReLU activation functions and check which one is giving high performance.

Note: You can use any DL library to implement the MLP

Data Sets: IRIS: https://archive.ics.uci.edu/dataset/53/iris

CIFAR-10: https://www.cs.toronto.edu/~kriz/cifar.html

(Divide the data into train and validation sets, having 80% of each class in the train and rest for the validation). Report the validation performances.