

DEEP LEARNING ASSIGNMENT

In this assignment, you will be implementing a 3 layers deep feed-forward neural network from scratch For multiclass classification on [SVHN](#) Dataset. In the dataset, every image is 32x32x3, so first, you have to flatten it. Detailed instructions are given below.: (You are not allowed to use any library, e.g., PyTorch, Tensorflow. Only Numpy can be used.)

- A. Implement 3 layer deep feed-forward neural with a sigmoid activation function. [10 points]
- B. Implement Xavier weight initialization scheme [5 points]
- C. Implement cross-entropy loss [5 points]
- D. Implement backpropagation [15]
- E. Implement SGD and RMSProp optimizer to update the weights [10 points]
- F. Find the hyperparameter of the network, such as the learning rate and number of neurons in hidden layers. [3]
- G. Report the accuracy, F1-score, Test-Train loss, etc. [2]