भारतीय सूचना प्रौद्योगिकी संस्थान गुवाहाटी

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY GUWAHATI

CS 360: Machine Learning Lab
Practice Assignment 8

Instructions: This is only for practice. Complete it by 12:00 PM today. Your completion will be reviewed by the Teaching Assistants.

1. Write a program to perform classification on XOR gate using Multi-layer Perceptron (MLP) algorithm with error Back-propagation **without using in-built Python packages**.
   Consider the following :

   1. Activation function: Sigmoid
   2. Number of hidden layer: 1
   3. Number of neurons in hidden layer: 2
   4. w= random initialization.
   5. learning rate, α= 0.1
   6. Number of epochs: 2
   7. train: validation: test split : 70:10:20

   (a) Report the class-wise accuracy, precision, recall for training and testing samples, after 2 epochs.

2. Write a program to perform classification using Pima Indian Diabetes dataset using using Multi-layer Perceptron (MLP) algorithm with error Back-propagation (**In-built python packages can be used**).
   Consider the same parameter and hyperparameter settings as Q1, except number of epochs to be 50 and 100.
   Finally report class-wise precision, recall, accuracy and overall accuracy considering 5-fold cross validation, considering both cases of epochs.