Deep Learning
Assignment - 3
Classification using Perceptron

Instructions:

1. Provide commented, indented code. Variables should have meaningful names.
2. Use Google Colab as the code editing/ execution environment.
3. Write questions in separate text blocks before the code blocks containing answers.
4. Read the questions carefully before answering. If a question asks to follow a particular approach or to use a specific data structure, then it must be followed.

Tasks:

1. Implement Perceptron model from scratch and compare its performance with Logistic Regression for the task of binary classification on the given three datasets. You are NOT allowed to use in-built function for implementing Perceptron. For each of the three datasets, you are given two separate files, for example, data1_train.csv and data1_test.csv, having comma separated values, for data1_train.csv, you are given the features and the label for each datapoint, for data1_test.csv, you are only given the features. You will train your model on all the training dataset and use the trained Perceptron model to predict labels for the datapoints in the test data.

   [2 Marks]

2. Submit the predicted labels for all three datasets as follows: For example, for data1, the predicted labels must be put as a separate column titled `Predictions' beside the test datapoints in data1_test.csv. Submit the modified .csv file containing the predictions. Do this for all three datasets, i.e. your submission must include three .csv files data test.csv, data2 test.csv anddata3 test.csv.

   [1 Marks]

3. Plot the decision boundary plots for both the two models, i.e., Logistic Regression, and Perceptron, and write down your observations comparing and contrasting between the three plots. NOTE: You need NOT do this for dataset3.

   [1 Marks]

4. Mention whether the data is linearly separable or not linearly separable using the Perceptron model.

   [1 Marks]