Deep Learning
Lab Assignment 2

DUE DATE: NOT. 6, 2020

OBJECT OF THE ASSIGNMENT:

To understand how the logistic regression learns the weight and bias values.

PROBLEM:

Implement the algorithm for logistic regression.

INPUT OF THE PROBLEM:

Training examples/ testing examples.

OUTPUT OF THE PROBLEM:

(a) Display the weight and bias values of a proper decision boundary if the logistic regression converges. Otherwise, you need to display the maximum number of epochs.

(b) Predict the class for each testing example if testing examples are given.

(c) Plot the final decision line and given training/testing examples in one figure.

TESTING CASES:

(1) Find a decision boundary for the AND function if the following training examples are given:

x_1	x_2	y
0	0	0
0	1	0
1	0	0
1	1	1

Where $\mathbf{x} = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$ is an input vector, and y is the corresponding target.

(2) Repeat testing case (1) for OR function if the following training examples are given:

x_1	x_2	y
0	0	0
0	1	1
1	0	1
1	1	1

(3) Repeat testing case (1) for XOR function if the following training examples are given:

x_1	x_2	y
0	0	0
0	1	1
1	0	1
1	1	0

(4) Consider the following ten training examples. The input attributes are height (x_1) and weight (x_2), and the target classes are children (target 0) and adults (target 1).

x_1	x_2	y
170	80	1
90	15	0
130	30	0
165	55	1
150	45	1
120	40	0
110	35	0
180	70	1
175	65	1
160	60	1

Apply the logistic regression to find a decision boundary and predict the class labels of the following testing examples:

x_1	x_2
170	60
85	15
145	45