**Lab Assignment 1**

**I. Introduction:**

In this Lab Assignment I tried to implement a Logistic Regression which contains below expression:

P(Y=1|x) = 1/1+exp (-w^T\*x + b) which was implemented using MNIST data which contains 50,000 images.

**II. Objectives:**

To show the graph of Logistic Regression which was implemented in the Tensor flow.

**III. Approaches/Methods:**

1. I have used tensor flow library, imported MNIST data sets initially.
2. Calculated cost function for each epoch, calculated accuracy for the variables X and Y of MNIST data which are set of images and their numerical values.
3. The screenshots are in the below section
4. The session run of the tensor flow contains the main logic where the cost is optimized using logistic regressor just like we optimized it using linear regressor in the inclass.

**IV. Workflow:**

1. The screenshot shows the work flow of the program:

The events are written to the file in graphs/linear\_reg

A screenshot of a computer

Description generated with very high confidence

1. The below is the output of the logistic regression onlineA screenshot of a computer

   Description generated with very high confidence
2. The below is the output downloaded:

A close up of a map

Description generated with high confidence

**V. DataSets:**

The data sets used are MNIST images which are directly imported from the library like I mentioned in the previous section are 50,000 images and their numerical labels

**VI. Parameters:**

Variables are X and Y and parameters are weights and a constant class bias. Using these cost and accuracy are calculated which are also in above screenshot.

**VII. Evaluation and Discussion:**

This is an improvement to linear regression which will not work in case of many variables and the output is fluctuating which is reduced in Logistic regression by using binary regression which means input is considered in 2 sets like > a value will be set to 1 and all the values less than that will be set to 0. This helps in more accuracy in test data.

**VIII. Conclusion:**

Logistic regression gives better accuracy for same input data than linear regression.