**CS5590 APS - Deep Learning Programming**

**LAB3**

**Deadline: 11/7/2018**

The following assignment focus on to make one familiar with Keras library

**LAB Assignment:**

1. Implement the **Linear Regression** with any data set of your choice except the datasets being discussed in the class

**a**. Show the graph in TensorBoard

**b**. Plot the loss and then change the below parameter and report your view how the result changes in each case

1. learning rate
2. batch size
3. optimizer
4. activation function

2. Implement \***Logistic Regression with** any data set of your choice.

a. Show the graph in TensorBoard

b. Show the Loss in TensorBoard

c. use **score=model.evaluate(x\_text,y\_test)** and then **print(‘test accuracy’, score[1])** to print the accuracy

c. Change three hyperparameter and report how the accuracy changes

**\*Logistic regression:** for understanding the difference between Linear Regression and Logistic Regression refer to this link**:** <https://stackoverflow.com/questions/12146914/what-is-the-difference-between-linear-regression-and-logistic-regression>

**In summary:**

Linear regression uses the general linear equation Y=b0+b1\*X where Y is a **continuous dependent** variable (for example predicting the prices of houses). Logistic regression is another generalized linear model procedure using the same basic formula, but instead of the continuous Y, it is regressing for the probability of a **categorical** **outcome** (for example predicting Email as spam or NOT spam. Also, another example can be using MNIST dataset in which the labels of the dataset are 10 different categories. So, the problem will be predicting the correct category of the input dataset).

**LAB Submission Guidelines (for both In Class and Online students):**

1. LAB submission is in pairs of two students.

2. Submit your source code and documentation to GitHub and represent the work through wiki page properly (submit your screenshots as well. The screenshot should have both the code and the output)

3. Comment your code appropriately

4. Video Submission (2 – 3 min video showing the demo of the LAB, with brief voice over on the code explanation)

5. Submit **only** report at Turnitin in UMKC blackboard

6. Remember that similarity score should be less than **15%**

7. Use this link to submit your LAB#: https://docs.google.com/forms/d/e/1FAIpQLScjwMFgNiEOKz3A06nb4jlfFvUaDT1HGa9FQs32GyBprr9A8g/viewform

8. Report should include below details

I. Introduction

II. Objectives

III. Approaches/Methods

IV. Workflow

V. Datasets (if applicable)

VI. Parameters

VII. Evaluation & Discussion

VIII. Conclusion

**LAB Evaluation Criteria:**

1. Report similarly score (should be less than **15%**)

2. Report Quality (check the below example reports for reference)

3. Time (should submit before due time)

4. Wiki page

**Example Reports:**

<https://github.com/stratospark/food-101-keras>

<https://github.com/matterport/Mask_RCNN>

<http://blog.stratospark.com/deep-learning-applied-food-classification-deep-learning-keras.html>

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