**CS5590 APLS - Deep Learning Programming**

**LAB2**

**Deadline: 05/11/2020**

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

**LAB Assignment:**

1. Build a Sequential model using keras to implement **Linear Regression** with any data set of your choice except the datasets being discussed in the class or used before

**a**. Show the graph on 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** on following dataset<https://www.kaggle.com/ronitf/heart-disease-uci> .

a. Normalize the data before feeding it to the model

b. Show the Loss on TensorBoard

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>

3. Implement the image classification with CNN model on anyone of the following datasets

<https://www.kaggle.com/slothkong/10-monkey-species>

<https://www.kaggle.com/prasunroy/natural-images>

4. Implement the text classification with CNN model on the following movie reviews dataset <https://www.kaggle.com/c/sentiment-analysis-on-movie-reviews/data>.

5. Implement the text classification with LSTM model on the following movie reviews dataset.

<https://www.kaggle.com/c/sentiment-analysis-on-movie-reviews/data>

6. Compare the results of CNN and LSTM models, for the text classification and describe, which model is best for the text classification based on your results. Tune the hyperparameters to attain good accuracy and show the results.

7. Apply Autoencoders on MNIST dataset and show the encoding and decoding on a particular image. Make sure you document each and every line of the code.

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

1. LAB submission is in a group of three.

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/1FAIpQLSdomstfhXn4UMfB8v-YVL_BwQjItdindQCdgxSmwisn6m3eIA/viewform?usp=sf_link>

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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