BME 6938 MULTIMODAL DATA MINING
MINI PROJECT 3

DUE DATE 04/11/2019

- Please turn your homework code through a GitHub Repository (see below).
- No late homework will be accepted (you will not be able to submit the repository link to Canvas after the due date). Do not change the repository after the due date; your homework will not be graded.
- 20 points total

a) Read this blog post that demonstrates how to define a simple multilayer perceptron and a convolutional neural network (CNN) in Keras for recognizing handwritten digits. Follow the same steps in a notebook for both multilayer perceptron and the convolutional neural network. There is no need to test the larger convolutional neural network [5 points].

b) Now, use the CIFAR10 dataset that is included with Keras in a similar manner. See this link for more information on the dataset. Import and use the CIFAR10 dataset using the following statements. You can use local CPU/GPU or Google colab. Report accuracy using multilayer perceptron and the convolutional neural network. [10 point].

```
from keras.datasets import cifar10
# load data
(X_train, y_train), (X_test, y_test) = cifar10.load_data()
```

c) ResNet uses residual connections to improve the performance of the convolutional neural networks. Read this blog post that explains the mechanism of ResNet. Follow the code in the blog to load ResNet50 and use this model on CIFAR10 dataset. Report accuracy. [5 points]

d) Create a GitHub repository and share your code via GitHub with the instructor by submitting the link on Canvas. Make sure the uploaded .ipynb file includes correct output results.