Homework 3: Stock prediction

EE547/647

# NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Due by 11:59p.m. on March 11, 2020

For this homework, you will be creating your own stock prediction algorithm in Keras. Keras builds on Google’s Tensorflow Framework. Please view Keras installation instructions here: <https://keras.io/#installation>.

This homework assignment needs to be implemented in a Jupyter Notebook. Installation instructions can be found here: <https://jupyter.readthedocs.io/en/latest/install.html>. You will turn in a completed pdf of this document, your jupyter notebook, and any data files you used.

Turn in only one Jupyter Notebook. Multiple Jupyter Notebooks will incur penalties.

1. (25 Points)

Download the Homework\_2 jupyter notebook from MyCourses and the “ge\_stock.txt” file. Change the network as follows:

Keras comes with pre-implemented loss functions and optimizers:

Loss Function => <https://keras.io/losses/>

Optimizer => <https://keras.io/optimizers/>

Please pick two loss functions and two optimizers (for a total of four combinations) and compare their results using 10 epochs. Include a plot of the actual stock values and the predicted values for each combination and comment your observation.

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| --- | --- | --- |
| Optimizer | Loss Function | Observation |
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Plots:

2). (25 Points)

Now that you have some experience changing a Keras Model for some simple stock prediction, it is now your turn. Pick any stock you want and create your own deep learning architecture (vanilla, CNN, RNN, ect.) to predict future stock prices for Five, Fifteen, Thirty, and 1 Year into the future. Note: the example above only predicted the next day’s stock value. You are not limited to the feature extraction, preprocessing, or validation process used in part 1. Be creative!

Briefly describe why you chose the deep learning architecture you used, along with reasons for choosing the number of epochs, optimizer, activation functions, number of neurons in each layer, batch size, and the validation methodology.