Assignment 1: Neural Networks

Purpose

The purpose of this assignment is to explore and extend your first Neural Network model.

This assignment aligns with the following module outcomes:

- MLO 1: Implement Keras and Tensorflow in a deep learning example by modifying an existing neural network model to improve performance.
- MLO 2: Explain how different approaches affect the performance of the model.

Getting Started:

In this assignment, you will accomplish the following:

1. Modify an existing neural network model to improve performance.
2. Understand how different approaches affect the performance of the model.

For the IMDB example that we discussed in class, do the following:

1. You used two hidden layers. Try using one or three hidden layers and see how doing so affects validation and test accuracy.
2. Try using layers with more hidden units or fewer hidden units: 32 units, 64 units, and so on.
3. Try using the mse loss function instead of binary_crossentropy.
4. Try using the tanh activation (an activation that was popular in the early days of neural networks) instead of relu.
5. Use any technique we studied in class, and these include regularization, dropout, etc., to get your model to perform better on validation.

Instructions (what to submit?):

All work must be your own. Copying other people's work or from the Internet is a form of plagiarism and will be prosecuted as such.

You will upload the following to your github account.

1. Your Python or R code, and well-documented knitted output as html/pdf/word.
2. A summary, graph/table, that summarizes your results with hypertuning the parameters for the IMDB problem. This graph or table should clearly indicate what "your" final conclusions or story will be.
3. There is no need to specifically answer the above questions as long as your responses address them.
4. Your final grade will be a combination of validation accuracy and your presentation of the results.

You should adhere to the following:

- Remember to create a new repository for the class and include your username as part of the repository. For example, Username_64061, or Username_AdvancedMachineLearning. The Username is very important.
- You will use that repository for ALL assignments. Do not create a new repository for each assignment. Instead, create a subfolder for each assignment. For this assignment, call it Assignment 1.

Provide the link to your git repository in Canvas for the assignment. The git link should end in **.git**. You may also make your repository private and give only the instructor access.

Submissions sent by email will NOT be accepted.

Due dates are listed in the Assignment Schedule document.