**Deep Learning Challenge Performance Report**

**Overview**

The purpose of the analysis is to discuss and evaluate the performance of the deep learning model created for AlphabetSoup. The analysis will discuss data preprocessing, and the compiling, training, and evaluation of the model.

**Results**

**Data Preprocessing**

* The target variable for the model is the “IS\_SUCCESSFUL” column
* The feature variables for the model included “STATUS”, “ASK\_AMT”, “APPLICATION\_TYPE”, “AFFILIATION”, “CLASSIFICATION”, “USE\_CASE”, “ORGANIZATION”, “INCOME\_AMT”, and “SPECIAL\_CONSIDERATIONS”
* The variables that are neither targets nor features and were removed were “EIN” and “NAME”

**Compiling, Training, and Evaluating the Model**

* For the neural network model, there were 2 hidden layers and 1 output layer. Each layer had 80, 30, and 1 neuron(s) respectively. The number of hidden layers and neurons was chosen to be a starting point for further optimization The activation function of the hidden layers were “relu” and the activation function of the output layer was “sigmoid”. “Relu” was chosen because it is a common activation function to use for hidden layers. “Sigmoid” was chosen because it is a common output activation function for 2-class prediction problems.
* The model was only able to reach an accuracy of 73%, and the target performance of 75% was not reached.
* To increase the performance of the model, an additional hidden layer was added, the number of neurons in the layers were adjusted, a different activation function was used in the hidden layers, and the number of epochs were decreased.

**Summary**

Overall, the adjustments did not increase the performance of the model, and the performance remained at 73%. My recommendation would be to try to optimize the model further by adjusting the input data as well as using an automatic optimizer. This is because the data has potential to be cleaned even further and the optimizer will make it easier to find the correct values for the hyperparameters.