**Performance Report on the Deep Learning Model**

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**Analysis Overview**

In this analysis, the goal was to develop an effective and accurate deep learning model to project which nonprofit organizations have the highest chance of succeeding given historical charity data from Alphabet Soup. To achieve this, a neural network was created and implemented a set of features to provide a deeper understanding of the dataset.

**Results**

Before diving too deep into the results, it is important to note touch upon the data preprocessing. Two columns, EIN and NAME, were dropped from the dataset as they added no predictive value for the analysis as unique columns. The target variable used was IS\_SUCCESSFUL. The data which was utilized to create predictions came from feature variables such as APPLICATION\_TYPE, AFFILIATION, CLASSIFICATION, and other columns containing facts related to the organization.

The model included two hidden layers, each containing six neurons. Both layers utilized the Relu activation function to incorporate non-linearity. This enabled the model to capture patterns. The output layer featured a single neuron with a sigmoid activation function used for binary classification of success or failure. This concept was selected to strike a balance between performance and intricacy, while ensuring the data was not overfit.

Unfortunately, the model fell just shy of the target accuracy goal of 75.00%, with the model providing an accuracy of 72.65%. This is not far off from the target, so adjustments could be made to improve the results and accuracy. A good starting point would be manipulating the hyper parameter combinations by changing the number of neurons, batch sizes, and epochs. Although different results were seen through changing the hyper parameters and layers, stronger results were not. Removing other features such as dropouts and variance were tested as well. Unsuccessful changes were removed from the final file.

**Summary**

The model generated with the Alphabet Soup charity dataset did not reach the target goal of 75.00% accuracy or greater, coming up just shy at 72.65% accuracy. Improvements could be made such as using the Gradient Boosting Machine or another alternative that uses different features and works better with non-linear relationships. The classification could improve from a performance standpoint based on the alternative’s flexibility given the dataset. All in all, the model was good but would be considered unsuccessful given the target goal.