Neural Network Model Analysis Report

**Overview:**

The objective of this analysis is to develop and train a Neural Network capable of evaluating venture applicants and making predictions about their potential for success. This will be achieved by utilizing various attributes, including Government Organization Classification, Income classification, Funding Amount Requested, Sector Affiliation, and several others.

**Results:**

* **Data Preprocessing**
  + **What variable(s) are the target(s) for your model?**

IS\_SUCCESSFUL, is the variable that is the target of this model, as the goal was to ass which companies funded by the Alphabet Soup foundation efficiently used their funds.

* + **What variable(s) are the features for your model?**

The provided CSV file contained various features that assisted us in evaluating the success of the companies funded by Alphabet Soup. These features include 'APPLICATION\_TYPE', 'AFFILIATION', 'CLASSIFICATION', 'USE\_CASE', 'ORGANIZATION', 'STATUS', 'INCOME\_AMT', 'SPECIAL\_CONSIDERATIONS', and 'ASK\_AMT'.

* + **What variable(s) should be removed from the input data because they are neither targets nor features?**

EIN’ and ‘NAME’ were removed from the input data, as they assisted in

identifying the companies funded by Alphabet Soup, but did not offer any

measurable differentiation between the companies.

* **Compiling, Training, and Evaluating the Model**
  + **Were you able to achieve the target model performance?**

We were unable to achieve the target model performance, as the highest accuracy achieved was 73%.

* + **What steps did you take in your attempts to increase model performance?**

We attempted to improve the accuracy in the optimized code from the starter

code in several ways. Additional bins were created for the “Classification” and

“Application\_Types” features. Also, a Keras tuner was utilized to determine

ideal activation functions for each layer, the number of neurons for each layer,

and number of layers.

**Summary:**

Even after implementing the optimization measures, the model's prediction accuracy for success remained at 73%. However, additional optimization steps could have been taken. For instance, we only applied one-hot encoding to two features, while there were several others, such as 'Use-Case' and 'Organization', that could have also been one-hot encoded. Although this would have increased the input dimensions significantly, it could have allowed the deep learning model to prioritize other features rather than placing excessive emphasis on 'Application Types' and 'Classification'.