Neural Network Model Report

In creating this deep learning model through the use of a neural network, I was able to predict the success of the organizations given the features that were provided. This model helps makes decisions to approve funding which leads to support for which organizations should be supported by Alphabet Soup.

**Results:**

What variable(s) are the target(s) for your model?

- Target variable for the model was 'IS\_SUCCESSFUL', meaning whether an organization was successful in receiving funds or not.

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

* Features include ‘APPLICATION\_TYPE’, ‘AFFILIATION’, and ‘CLASSIFICATION’ to name a few examples from this model.

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

* ‘EIN’,’NAME’, and for optimization ‘USE\_CASE’

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

Through trial and error with a few different changes I was able to achieve results that approached 75% but did not reach that goal in the changes that I attempted. I used 3 different hidden layers in trying to improve the accuracy of this model and with more time I could probably have made more changes to increase this accuracy. My attempts did improve each time demonstrating that I was on the right track to reaching the goal.

**Achievement of Target Model Performance:**

- The model achieved a certain accuracy and loss on the training and validation datasets, indicating its performance of an accuracy of 72% . I did not achieve 75% model accuracy target, but as stated earlier with each attempt my accuracy improved.

**Steps to Increase Model Performance:**

I combined two of these steps together which each attempt in the order they are written, so I dropped columns and created more bins, then I increased the number of values for each bin and added more neurons, etc.

* Dropping more or fewer columns.
* Creating more bins for rare occurrences in columns.
* Increasing or decreasing the number of values for each bin.
* Add more neurons to a hidden layer.
* Add more hidden layers.
* Use different activation functions for the hidden layers.
* Add or reduce the number of epochs to the training regimen.

**Summary:**

Overall, this model demonstrated fair success in predicting which organizations should be supported by Alphabet Soup.