**Overview**

The purpose of this analysis is to construct and then evaluate the accuracy of a model to predict applicants’ chances of success in ventures that the nonprofit ‘Alphabet Soup” will fund.

In the first attempt, we used two inner layers and achieved a success rate of 72.59%. Since we were aiming for a success rate of over 75%, we altered our model, putting more emphasis on the name of the applicant, and the types of application and classifications, while adding an inner layer.

We found that if the name of the applicant appeared 5 or more times, there was a greater chance of success. Thus, the use of the ‘NAME’ column.

Certain types of applications were more successful

Certain types of classifications were more successful.

This led to us adding the inner layer to the model as well as using the above columns for binning. In the original model, we actually dropped the ‘NAME’ column form the dataset, but in the optimized version, we were able to achieve 79.03% accuracy using it and making the other changes.

**Variable details**

* The target variable for the model was “IS\_SUCCESSFUL” with the ‘TRUE’ result being the desired outcome
* The featured variables for the model were application type, classification type, and, on the optimized version, ‘name’.
* We removed the EIN variable from the dataset, since it was neither a featured or target variable

**Summary**

* We used 2 neural nets and 2 layers in the first attempt, achieving 72.56% accuracy with 5741 total parameters. We used 3 layers and 3 neural nets in the 2nd attempt, and achieved above the target 75% at 79.03%. This model used 51471 parameters, more than the first attempt by an order of magnitude.
* In the second attempt, we used different featured variables and added a layer to get to the target.
* The optimized model was successful in hitting the target, though we did increase the total parameters by a factor of ten for a modest increase in accuracy.
* A Random Forest Classifier, which employs a decision tree to classify samples and uses averaging to improve accuracy might also produce good results, since this exercise essentially asks us to classify the applicants, a purpose for which that model is well suited.