Neural Network Report

**Analysis**The nonprofit foundation Alphabet Soup wanted a tool that could help select applicants for funding with the best chance of success in their ventures. Questioning of this caliber could be answered through a binary classifier that could predict whether applicants will be successful through Alphabet Soup funding. Assessing multiple neural networks and determining which yielded the most fruitful results in terms of accuracy would be the direct answer to their problem.

**Results**

* Data Preprocessing
  + The “IS SUCCESSFUL” column served as the target variable.
  + All the columns apart from “IS SUCCESSFUL”, ”NAME”, and ”EIN” consider themselves to be the features.
  + The variables to be removed from the input data since they are neither a target nor a feature are the “NAME” and “EIN” Columns.
* Compiling, Training, and Evaluating the Model
  + The first and hidden layer is sorted through values of 1-30 neurons incrementing by 5, using the activation functions relu and tanh. The output layer has one neuron and uses a sigmoid as it’s activation.
  + I wasn’t able to reach the target performance of 75% accuracy, but did get close to it at ~73&%.
  + A step that was taken, not noted before, was to set the epochs to 80, which was more time-consuming but yielded more usable information to determine the best model.

**Summary**

The model's overall results gave a modest level of insight into which applicants should get funding. Still, improvements could be made in the neural network and feature utilization. A model that could’ve been utilized separately from a neural network is using a random forest and feature importance to determine which columns better determine the success of some of these applicants.