**Analysis of Neural Network Model**

**Overview:**

The purpose of this analysis was for the nonprofit Alphabet Soup organization to create a tool to help select applicants for funding with the best chance of success in their ventures. Features were used from machine learning and neural networks to create a binary classified that can help predict if applicants will be successful.

**Results:**

* Data Preprocessing:
  + What variable(s) are the target(s) for your model?
    - Whether or not the target is considered successful, by using “IS\_SUCCESSFUL” specifically to see if the money will be used effectively.
  + What variable(s) are the target(s) for your model?
    - The following data elements were used by the model to capture the data. The 2 data elements that were excluded are: 1. EIN and 2. NAME. The list below are the data elements that were included. They are:
      * APPLICATION\_TYPE
      * AFFILIATION
      * CLASSIFICATION
      * USE\_CASE
      * ORGANIZATION
      * STATUS
      * INCOME\_AMT
      * SPECIAL\_CONSIDERATIONS
      * ASK\_AMT
  + What variable(s) should be removed from the input data because they are neither targets nor features?
    - The “EIN” and “NAME” data elements were removed because they are identifiers of individuals in the data.
* Compiling, Training and Evaluating the Model:
  + How many neurons, layers and activation functions did you select for your neural network model and why?
    - I used 2 hidden layers with 100 and 50 as the “hidden nodes.” This created 3 hidden layers: dense 3, 4 and 5. A standard rule of thumb is to run the number of neurons 2 to 3 times the number of input features.
    - Were you able to achieve the target model’s performance?
      * No, there was only roughly 73% accuracy with this model with a model loss of approximately 57%.
  + What steps did you take in your attempts to increase model performance?
    - To adjust the data so no outliers are there to skew the data results.
    - Scaling down the number of columns selected to the bare minimum needed.
    - Creating more bins for the data.
    - Add more neurons to a hidden layer.
    - Add more hidden layers.
    - Increase or decrease the number of epochs used in the training model.

**Summary:**

* The overall results of the deep learning model are close to 75% accuracy, which I think is successful. To improve the model as far as the classification problem goes, I guess more hidden layers could be added and perhaps dropping down to the necessary columns, lightening the data load somewhat. More accuracy might be available if the columns “NAME” was not dropped out. A better picture of the results would be more accurate with the column “NAME” included; I think.