**Report Module 21 Challenge Deep Learning**

**Overview**

The objective of this challenge is to create a neural networks binary classifier to predict whether applicants will be successful if funded by the non-profit foundation, Alphabet Soup.

**Results**

**Data Preprocessing**

· Dropped non-beneficial columns.

· Examined the number of data points for each unique value for the columns application-tyoe and classification, which had more than 10 unique values.

· Created a new value called "Other" by binning categorical values points of 200 for application type and 288 for classification

· Converted categorical data to numeric using pd.get\_dummies().

· Split the data into a target array (Is\_Susccessful) and features arrays.

· Created testing and training datasets using train\_test\_split.

· Scaled the training and testing sets using StandardScaler.

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

First I chose to use 2 hidden layers of 8 neurons each using the relu activation functions and ran 100 epochs which produced an accuracy of 72.7%

The steps did you take in your attempts to increase model performance were reducing the number of epochs to 50, increasing the number of neurons from 8 to 13 on the first hidden layer and then using the TanH activation function on one of the hidden layers. None of these changes enabled the model to achieve target performance and all actually reduced the performance to 72.61%, 72.56% and 72.49% respectively

**Summary**

In the three attempts, the model achieved an accuracy score ranging from 72.49% to 72.7%. The parameters changed showed minimal improvement in the prediction model. In hindsight finding and removing outliers, or changing how the data was binned or even removing columns might have been more successful was to improve the model and achieve the desired value of >75%a of predicting whether applicants will be successful if funded by Alphabet Soup.