**Overview:**

The purpose of this task is to create a binary classifier for the nonprofit foundation Alphabet Soup, who wants a tool that can help it select the applicants for funding with the best chance of success in their ventures by predicting whether applicants will be successful if funded.

**Data Preprocessing:**

We started by cleaning the data received from Alphabet Soup. Removed unwanted data (EIN and NAME), Reduced data points for CLASSIFICATION and APPLICATION\_TYPE where there were more than 10 unique values. And finally, object was transformed into numeric values. IS\_SUCCESSFUL was chosen as target variable and all other numeric data points were chosen as feature variables.

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

The data was split into training and testing sets then Neural Network was applied on the test data. On our first model we used 2 hidden layers with 7 and 14 neurons respectively with ‘relu’ activation model on input and on hidden layer and ‘sigmoid’ model on output layer.

On the Optimization model, we used 3 hidden layers with 21 neurons on the third layer. Used ‘sigmoid’ activation model on the third layer and a ‘linear’ activation model for output layer.

On our first model we used 5 epochs whereas on our second model we used 10 epochs.

First model:

A screenshot of a computer program

Description automatically generated

Optimized model:

A screenshot of a computer

Description automatically generated

**Summary:**

Our target accuracy was 75% which we could not reach on either of the models. Though we found with lesser hidden layers and lesser epochs we reached 72% accuracy and when we increased hidden layers with more neurons and more epochs, the accuracy actually dropped.

The verdict of the task is, this binary classifier will not serve the purpose of finding successful applications using such number of layers and epochs on the given data. As a next step, a “Deep Forest” model maybe tried to see if that can get better results.