# Report on the Neural Network Model for Alphabet Soup

### Overview of the Analysis

The purpose of this analysis was to develop a deep learning model to predict whether organizations funded by Alphabet Soup would be successful. This was based on various factors provided by the dataset. By preprocessing the data, designing an appropriate neural network, and optimizing the model, the goal was to achieve a target predictive accuracy higher than 75%.

### Results

#### Data Preprocessing

##### What variable(s) are the target(s) for your model?

* IS\_SUCCESSFUL

##### What variable(s) are the features for your model?

* 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?

* EIN
* NAME

#### Compiling, Training, and Evaluating the Model

A screenshot of a computer program

Description automatically generated

##### How many neurons, layers, and activation functions did you select for your neural network model, and why?

* For the neural network model, I selected;
  + Input layer with neurons equal to the number of features,
  + Two hidden layers with 80 and 30 neurons, respectively.
  + Activation functions used were ReLU for the hidden layers and Sigmoid for the output layer.

##### Were you able to achieve the target model performance?

A close-up of a code

Description automatically generated

* No, I was unable to achieve the target model performance.
* I made multiple attempts, but 73% was the highest mark I could achieve.

##### What steps did you take in your attempts to increase model performance?

* Ensure proper data processing steps.
* Added two hidden layers.
* Utilized ReLU activation for hidden layers.

#### Summary

* Deep learning model did not achieve target.
* More testing can be done to improve the model.
* An alternative model to solve the same problem is Support Vector Machine.
* SVM could provide advantages such as; robustness, effectiveness, and interpretability.