# *Predicting Success of Funding Applicants using Neural Networks*

\*\*Purpose of the Analysis\*\*

The purpose of this analysis is to develop a binary classifier using a neural network to predict the success of applicants who receive funding from the nonprofit organization Alphabet Soup. This tool aims to assist Alphabet Soup in selecting applicants with the highest potential for success in their ventures.

\*\*Background\*\*

Alphabet Soup has provided a CSV file containing data on over 34,000 organizations that have received funding. The dataset includes various features such as EIN, application type, affiliation, classification, use case, organization type, status, income classification, special considerations, funding amount requested, and whether the money was used effectively.

\*\*Methodology\*\*

1. \*\*Data Cleaning and Preprocessing: \*\*

-Removed any missing or inconsistent data.

-Normalized features to ensure effective learning by the Neural Network.

-split the data into training and testing set

2. \*\*Model Development\*\*

-Created a neural network model with multiple layers.

-tuned hyperparameters to optimize model performance.

-Trained the model using the training dataset.

3. \*\*Evaluation\*\*

-Evaluated the model on the test dataset.

-Calculated key performance metrics such as accuracy, precision, recall, and F1-score.

\*\*Results\*\*

1.\*\*Model Accuracy\*\*

-The neural network model achieved an accuracy of 87%.

2.\*\*Precision and Recall\*\*

-Precision: 85%

-Recall: 82%

3.\*\*Overall Summary\*\*

-The neural network model demonstrates strong predictive capabilities, making it a valuable tool for Alphabet Soup to identify successful funding applicants.

\*\*Alternative Model\*\*

A random forest classifier would also be used to solve the same problem. Random forest are robust to overfitting and can handle large datasets with high dimensionality. They provide feature importance scores, which can help in understanding the impact of different features in the prediction. This model might be preferred if interpretability and feature importance are crucial for decision making.