# Overview of the analysis:

The following is an analysis for the company Alphabet Soup in order to select applicants for funding. The goal is to accurately select which applicants have the highest chance of success based on a set of features.

# Data Preprocessing

- **Model Target:**
    - IS_SUCCESSFUL—Was the money used effectively
- **Model Features:**
    - APPLICATION_TYPE—Alphabet Soup application type
    - AFFILIATION—Affiliated sector of industry
    - CLASSIFICATION—Government organization classification
    - USE_CASE—Use case for funding
    - ORGANIZATION—Organization type
    - STATUS—Active status
    - INCOME_AMT—Income classification
    - SPECIAL_CONSIDERATIONS—Special considerations for application
    - ASK_AMT—Funding amount requested
- **Columns that are neither Targets nor Features:**
    - EIN and NAME—Identification columns

# Compiling, Training, and Evaluating the Model

**Initial Model ("AlphabetSoupCharity.ipynb")**

- The initial model was trained with 2 hidden layers using the ReLu activation function.
- The first hidden layer had 8 neurons
- The second hidden layer had 5 neurons
- These values were chosen as a baseline, before attempting to optimize.
- The resulting accuracy was **73%**

**Optimized Model ("AlphabetSoupCharity_Optimization.ipynb")**

- The optimized model was trained using 6 hidden layers using the Sigmoid activation function
- The first hidden layer had 9 neurons
- The second hidden layer had 3 neurons
- The third hidden layer had 9 neurons
- The parameters of this model was determined automatically using the keras tuner library
- The resulting accuracy was **also 73%**
- We were unable to increase the accuracy of the model above 75% using the keras tuner values. Possible further exploration could be needed into the input of the automatic keras function which produces the values.