1. **Overview** of the analysis: Explain the purpose of this analysis.

The non-profit foundation Alphabet Soup wants to create an algorithm to predict whether or not applicants for funding will be successful. Purpose of this analysis is to analyze the CSV file containing more than 34,000 organizations that have received funding from Alphabet Soup over the years. Utilizing ML and neural networks, created a binary classifier that provides prediction model whether the applicants will be successful if funded by Alphabet Soup

1. **Results**: Using bulleted lists and images to support your answers, address the following questions.

* Data Preprocessing
  + What variable(s) are considered the target(s) for your model?
    - IS\_SUCCESSFUL Column
  + What variable(s) are considered to be the features for your model?
    - APPLICATION\_TYPE, AFFILIATION, CLASSIFICATION, USE\_CASE, ORGANIZATION, STATUS, INCOME\_AMT, SPECIAL\_CONSIDERATIONS, ASK\_AMT Columns are used as the features for the model
  + What variable(s) are neither targets nor features, and should be removed from the input data?
    - EIN, Name Columns are neither targets nor features and have been removed from the modeling
* Compiling, Training, and Evaluating the Model
  + How many neurons, layers, and activation functions did you select for your neural network model, and why?
    - 2 hidden layers were used for the model
    - Activation function: ‘RELU’ for input/hidden layers ‘sigmoid’ for output layer
    - Initially used 80 nodes for first hidden layer and 50 nodes for second hidden layers
  + Were you able to achieve the target model performance?
    - 4 different attempts to increase the overall performance but was not able to achieve the 75% or higher accuracy for this prediction model
  + What steps did you take to try and increase model performance?
    - Optimization 1 : increased the number of neurons from 80/50 to 160 /100
    - Optiomization2 : increased the number of hidden layers from 2 to 3
    - Optiomization3 : Increased the number of epoch from 50 to 300

1. **Summary**: Summarize the overall results of the deep learning model. Include a recommendation for how a different model could solve this classification problem, and explain your recommendation.

Despite the effort to optimize by changing the hidden layers, neurons, and epochs, accuracy level were consistent across the models. We could also try to utilize supervised machine learning such as LogisticRegression or RandomForestClassifier

* Initial - Loss: 0.5521629452705383, Accuracy: 0.7268804907798767
* Optimization1 - Loss: 0.5539423823356628, Accuracy: 0.7259474992752075
* Optimization2 - Loss: 0.5533915758132935, Accuracy: 0.7254810333251953
* Optimization3 - Loss: 0.6464524865150452, Accuracy: 0.7267638444900513

