Alphabet Soup Analysis

Overview:

This analysis was aimed at creating a neural network model that could predict whether a charity would be successful in receiving funding, with a target predictive accuracy of 75% or higher.

Results:

Data Preprocessing:

- The target variable for the model is the IS_SUCCESSFUL column.
- The feature variables for the model are APPLICATION_TYPE, AFFILIATION, CLASSIFICATION, USE_CASE, ORGANIZATION, STATUS, INCOME_AMT, SPECIAL_CONSIDERATIONS, and ASK_AMT.
- The EIN and NAME variables were removed from the model as they are not target variables or feature variables.

Compiling, Training, and Evaluating the Model:

- I started with 3 layers (input- 5 neurons, output – 1 neuron, and one hidden layer – 15 neurons). I used the relu activation function because I wanted it to be able to handle challenging data but I didn't want to overly complicate it.
- I was not able to achieve target performance with any of my four attempts – the best I could achieve was 73%.
- To increase the model performance, I changed the binning criteria for the APPLICATION_TYPE and CLASSIFCATION features, altered the number of nodes per layer, and added another hidden layer to the model.

Summary:

My deep learning model was unable to accurately predict whether a charity would be successful in getting funding with an accuracy of 75%. Other changes to this model that may help it be more successful could be to add more layers and/or more nodes per layer and potentially increasing the epochs. Alternately, a logistic regression, random forest, or K nearest neighbor machine learning model may also be able to achieve a higher accuracy, as the goal of this model is classification. While these are all supervised learning models, they can be effective at differentiating between two populations and the model could then be used to predict success for future applicants.