Alphabet Soup Analysis

Overview

The goal of this analysis was to develop a deep learning model that predicts whether a charitable donation application is likely to be successful. We used data containing more than 34,000 organizations that received funding from Alphabet Soup over the years to help predict whether applicants will be successful

Results

Data Preprocessing:

- Target variable:
    - IS_SUCCESSFUL
- Feature variables:
    - Application_Type, Affiliation, Classification, Use_Case, Organization, Status, Income_Amt, Special_Considerations, & Ask_Amt
- Variables removed:
    - EIN
    - Name

Compiling, Training, and Evaluating the Model

- Neural Network
    - Input Layer: Number of neurons matched number of input features
    - Hidden Layer 1: 150 neurons, relu activation
    - Hidden Layer 2: 100 neurons, tanh activation
    - Output Layer: 1 neuron, sigmoid activation
- Target model performance was 75%, but we were slightly short from it at 73%
- Steps Taken to Improve Performance
    - Increased the number of neurons in each hidden layer
    - Tested different activation functions

Summary

The deep learning model was able to achieve a moderate performance (73%) in predicting successful donation applications. I would recommend using a different machine learning model like random forest because these models can better handle categorical variables and require less tuning.