Overview

The objective of this project is to use the features in the provided dataset to create a binary classifier that is capable of predicting whether applicants will be successful if funded by the Alphabet Soup Non-Profit Foundation. Creating a neural network using data pre-processing, creating training and testing sets, and finally analyzing models will predict if applicants will be successful or not.

Results

- **Data Processing**
    - The EIN and NAME columns were removed since they have no value to the model.
    - The variables being considered for my model are as follows: 'STATUS', 'ASK_AMT', 'IS_SUCCESSFUL', 'APPLICATION_TYPE', 'CLASSIFICATION', 'USE_CASE', 'ORGANIZATION', 'INCOME_AMT'. I dropped "USE_CASE_Other","AFFILIATION_Other" columns.
    - My Dependent variable is "IS_SUCCESSFUL" since we want to try to predict this with high accuracy.

- **First Attempt - Compiling, Training, and Evaluating the Model**
    - 2 Hidden Layers
    - 80 neurons (Layer 1), 30 neurons (Layer 2)
    - Used Relu and Sigmoid Activations Functions since sigmoid is best for binary classification problems as this and Relu is for nonlinear datasets.
    - Removed "USE_CASE_Other","AFFILIATION_Other" columns.

215/215 - 0s - loss: 0.5657 - accuracy: 0.7296
Loss:0.5656543374061584, Accuracy: 0.7295918464660645

- **Second Attempt -3 Hidden Layers(80, 30,15 neurons)**
    - 3 Hidden Layers
    - 80 neurons (Layer 1), 30 neurons (Layer 2), 15 neurons (Layer 3)
    - Used Relu and Sigmoid Activations Functions since sigmoid is best for binary classification problems as this and Relu is for nonlinear datasets.
    - Removed "USE_CASE_Other","AFFILIATION_Other" columns.

215/215 - 0s - loss: 0.5721 - accuracy: 0.7286
Loss:0.5720709562301636, Accuracy: 0.7285714149475098

- **Third Attempt - Change activation functions**
    - 3 Hidden Layers
    - 80 neurons (Layer 1), 30 neurons (Layer 2), 15 neurons (Layer 3)
    - Reordered Relu and Sigmoid Activations

215/215 - 0s - loss: 0.5714 - accuracy: 0.7278
Loss:0.5714176297187805, Accuracy: 0.7278425693511963

Changed the activation functions, Hidden Layers, and the number of neurons in order to achieve an accuracy of 75% or greater. However, the accuracy achieved did not exceed 73%.

Summary

The three models tried averaged 73% accuracy. To improve the accuracy, features with more definitive details would help determine the "IS_SUCCESSFUL" column. However, the modeling does lend itself to confirming companies would be successful if funded by the Alphabet Soup Non-Profit Foundation.