Neural Network Model Report

Overview:

* This analysis was used to create a deep learning network model that can be utilized by Alphabet Soup Charity to choose applicants that they should fund, those of which who would have the best chance at success in their ventures. The applicants come from a CSV file containing more than 34,000 organizations that have received funding from Alphabet Soup over the years.
* Below is a picture of our data:

A screenshot of a computer code

Description automatically generated

Results:

* Data Preprocessing
  + What variable(s) are the target(s) for your model?
    - Our target is to predict the IS\_SUCCESSFUL.
  + What variable(s) are the features of your model?

A list of words on a white background

Description automatically generated

* + What variable(s) should be removed from the input data because they are neither targets not features?
    - EIN & NAME columns
* Compiling, Training, and Evaluating the Model
  + How many neurons, layers, and activation functions did you select for your neural network model, and why?
    - I tried different approaches, using multiple numbers of neurons, ranging between 2-5 layers and two different activation functions.
  + Were you able to achieve the target model performance?
    - No
  + What steps did you take in your attempts to increase model performance?
    - I originally tried to create multiple attempts with different layers which yielded me no success. For my last attempt, I tried to optimize the model using hyperparameter options and kerastuner, which would have given me the best number of neurons, layers and activation but still had no success.

Summary:

* This challenge had me create a neural network model for Alphabet Soup Charity. The purpose was to choose the applicants who had the best chance of success. I started by preprocessing the data using Pandas and scikit-learn. Then I went on to compile, train, and optimize the model using TensorFlow. Lastly, I optimized the model using TensorFlow and utilizing a hyperparameters tuner to try and achieve the best possible/most efficient options for neurons, layers and activation. Unfortunately, I could not achieve the target model performance using the chosen model.
* There are multiple other options at choosing different models to use, such as random forests and decision trees. Random forests may have been a better option, due to some of its advantages. It is accurate and efficient when running on large databases, which is good because the CSV file contained over 34,000 organizations. It can handle thousands of input variables so the deletion of columns become less necessary. It also has the ability to estimate what variables are important which takes away the need for the deletion of some columns.