

Overview of the Analysis:

Alphabet Soup, a non-profit organization, seeks a tool that can assist in choosing applicants eligible for funding. They require a binary classifier to forecast the success of applicants who receive funding from Alphabet Soup. Overall, the purpose of this analysis is to create a neural network model for binary classification using preprocessed data to predict the success of a charity's funding.

Results:

- Data Preprocessing
 1. Target Variable(s) for the Model:
The target variable is "IS_SUCCESSFUL."
 2. Feature Variable(s) for the Model:
The features are all columns except "IS_SUCCESSFUL," which was used as the target.
 3. Variables to Remove from Input Data:
Columns 'EIN' and 'NAME' were removed during preprocessing and are neither targets nor features for the model.
- Compiling, Training, and Evaluating the Model
Neurons, Layers, and Activation Functions:
The model comprised an input layer, two hidden layers with 7 and 9 neurons, respectively, and an output layer with a sigmoid activation function. ReLU activation functions were used in the hidden layers.
 1. Target Model Performance: Neural Network was used on each model and originally set with 2. Then 3, for finally having 2 layers. For the final model, achieve an accuracy of over 72.9%.

Summary:

The deep learning model demonstrated a multi-layer neural network for binary classification, focusing on charity funding success. 2 layers were added, in order to have an accuracy of 72.9%. A layer of 3 was tested, but didn't give better performance. To potentially improve the model, the following could be considered:

An ensemble learning technique, like Random Forest or Gradient Boosting, might be considered. These models often perform well in classification problems, especially with tabular data, and they offer robustness against overfitting. The epochs is at 100, but can be changed maybe to have a better accuracy.