Charity Funding Analysis

Alphabet Soup, non-profit foundation

The purpose of this analysis is to create a binary classifier to predict whether applicants will be successful if funded by Alphabet Soup. The .csv file received for analysis contains information from over 34,000 organizations that have received funding over the years from Alphabet Soup.

Data Preprocessing:

* The target variable for this analysis is “Is successful”.
* The feature variables are Application type, Affiliation, Classification, use\_case, status, income amount and ask amount.
* EIN and Name variables were neither target nor features and were removed from the input data.

Compiling, training, and evaluating the model.

* First Evaluation:
  + In the first evaluation, there were 43 features and 3 hidden layers. In the first layer, I used 120 neurons and relu activation. In the second layer; 30 neurons with relu activation and the 3rd layer (output); 1 layer with sigmoid activation.
  + Training the model used 50 epochs and was evaluated to have 73.09% accuracy rate. (loss of 55.68%)
* Second Evaluation
  + In the second evaluation, I kept the features and the neuron counts the same but changed the input activation to tanh.
  + This evaluation had a lower accuracy rate of 72.95% with loss of 55.77%.
* Third Evaluation
  + In the third evaluation, I removed two additional features of Organization and Affiliation. This decreased the number of features to 33. I kept the neuron and layer count using relu activation on the two hidden input layers.
  + This third evaluation drastically decreased the accuracy to 63.54% with a loss rate of 63.55%. This tells me that Organization and Affiliation are key feature variables and should be included in the analysis process.
* Fourth Evaluation
  + Since I was not able to obtain an accuracy rate of 75%, I ran a fourth model but changed the neurons in the hidden layers while using relu activation of the two hidden input layers. Using 500 on the 1st hidden layer and 50 on the 2nd hidden layer resulted in an accuracy rate of 73.00% with 55.75% loss.

The overall results of using deep learning model for this analysis is a 73% accuracy rate.