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Charity Fund Success Model

Goal: this project is intended to predict whether a given charity will be successful should they be funded by the nonprofit Alphabet Soup. The prediction is being carried out through the use of neural networks and deep learning on over 34,000 applications.

Modeling

- Columns EIN and Name were dropped as they were considered to be irrelevant to the model.
- The remaining columns were then converted into numerical data using the 'pd.get_dummies' function.
- Owing to the high amount of variance in the CLASSSIFICATION category, values of less than 800 were placed in to an "Other" category. This was also done with APPLICATION_TYPE values of less than 528.
- The resulting dataset included 44 features, with the y variable being "is successful."
- The data was then split into training and test subsets.

Results

The stated goal was to achieve a predictive accuracy higher than 75%.

The first model returned an accuracy score of 72.5%, which fell short of the goal. The hyperparamters for this model were set somewhat arbitrarily with three layers. The first layer had ten units, the second had fifteen, and the output layer of course had one. I ran the model using the Relu activation function for 100 epochs. These variables resulted in a total of 1,459 parameters for the model.

For the second model, I added the 'NAME' column back into the dataset and trained the variance in the same manner as the CLASSIFICATION and APPLICATION_TYPE columns above. Adding this column back in and keeping the hyperparameters from the first model produced a new model with 9,519 parameters. This model returned an accuracy score of 79%, 4% above the stated goal for the project.

Summary

In two attempts I was able to successfully create a model with a target predictive accuracy of 79%. However, due to the size of the dataset and the binary nature of the inquiry, I would also explore different classification models including Logistic Regression or Random Forest to see if predictions might be improved further.