**Charity Funding Predictor**

Overview

The goal of this project is to create an algorithm using machine learning and

neural networks to predict whether applicants will be successful if funded by the

fictional non-profit foundation, Alphabet Soup.

Process

I was given a CSV file that I read into Pandas. This file contained more than

34,000 organizations that have received funding from the fictional foundation

along with several columns of metadata about each organization.

PREPROCESSING

I preprocessed the data by:

• dropping non-beneficial columns,

• finding the number of data points for each unique value for each of the

columns that had more than 10 unique values - APPLICATION\_TYPE and

CLASSIFICATION,

• choosing a cutoff point of 600 and 300, respectively, to bin rare

categorical values together into a new value called "Other",

• using `pd.get\_dummies()` to convert categorical data to numeric,

• dividing the data into a target array (IS\_SUCCESSFUL) and features arrays,

• applying the `train\_test\_split` to create a testing and a training dataset,

• and finally, using `StandardScaler` to scale the training and testing sets

The resulting data included 44 features. The target variable (y) was

IS\_SUCCESSFUL. The data was split into training and test subsets.

COMPILING, TRAINING, AND EVALUATING THE MODEL

The model was required to achieve a target predictive accuracy higher than

75%. I made three official attempts using machine learning and neural networks.

They all resulted in the same accuracy rate – right around 72%, so a little short of

the required target accuracy.

Results from each model attempt are detailed below:

The result has an **accuracy score of 72.8%. This was the highest accuracy score of the three models.** This

means that 72.8% of the model’s predicted values align with the dataset’s true

values.

The hyperparameters used were:

layers = 2

layer1 = 9 neurons and ‘relu’ activation function

layer2 = 18 neurons and ‘relu’ activation function

epochs = 100

Summary

The model was unable to achieve a target predictive accuracy higher than 72.8%. Hypertuning resulted in virtually no improvement. I would consider using another classification model to see if it is better at predicting whether applicants will be successful if funded by Alphabet Soup.