Title: Alphabet Soup Charity Funding Predictor using Deep Learning

Introduction:

The Alphabet Soup Charity Funding Predictor project aims to determine successful funding applicants using Deep Learning and Neural Networks. This involves data processing, model compilation, training, and evaluation. In an effort to optimize the model, alternative approaches, like using a Random Forest classifier, are considered.

Data Processing:

To streamline the dataset, irrelevant information such as EIN and NAME was removed from the model. The remaining columns were considered as features for the model, except for the second test where NAME was added back.

A screenshot of a computer

Description automatically generated

Due to high fluctuations, CLASSIFICATION and APPLICATION\_TYPE were replaced with 'Other'. The data was split into training and testing sets, with the target variable being "IS\_SUCCESSFUL," where 1 represented success and 0 represented failure.

A screenshot of a computer

Description automatically generated

The APPLICATION data was analyzed, and the values of CLASSIFICATION were used for binning, grouping "rare" categorical variables under the 'Other' label. The success of binning was verified, and categorical variables were encoded using 'pd.get\_dummies()'.

Compiling, Training, and Evaluating the Model:

A Neural Network with three layers was applied to the model, with the number of hidden nodes determined by the number of features. The initial attempt achieved 73% accuracy.

Optimizing the Model:

Considering alternative models, a Random Forest classifier is proposed as it handles both numerical and categorical features effectively, being robust to outliers. Through ensemble learning and decision tree-based approaches, it can capture complex relationships within the data. Additionally, reducing the number of epochs to a range between 20-50 could improve efficiency while still achieving satisfactory results and potentially reducing training time.