Deep Learning Challenge: Alphabet Soup

Overview: The Alphabet Soup non-profit organization aims to develop a predictive algorithm to determine the success of funding applications. Using machine learning and neural networks expertise, we need to utilize the dataset's features to build a binary classifier capable of forecasting whether Alphabet Soup-funded applications will succeed.

Results: To start processing the data, we eliminated any irrelevant details. After excluding EIN and NAME, the remaining columns were designated as features for the model. NAME was reintroduced in the second test specifically for grouping purposes. The data was then divided into training and testing sets. The target variable, labeled "IS\_SUCCESSFUL," was assigned a value of 1 for yes and 0 for no. We analyzed the APPLICATION data, utilizing the "CLASSIFICATION" value for grouping. We established several data points as thresholds for combining "rare" variables and assigning them the new label "Other" for each unique value. Following a check to ensure successful grouping, categorical variables were encoded using the get\_dummies() function.

Compiling, Training and Evaluating the Model:

Each model utilized three layers in total following the application of Neural Networks, with the number of hidden nodes determined by the quantity of features available.

A screenshot of a computer program

Description automatically generated

A three-layer training model generated 477 parameters. The initial trial achieved slightly over 71% accuracy, falling slightly short of the desired 75%, but it was reasonably close.

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Optimization:

The second try, incorporating the "NAME" column in the dataset, yielded an accuracy of nearly 79%. This surpasses the target of 75% by 4%, utilizing 3,298 parameters.

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Using multiple layers in deep learning models is advisable because it enables the system to effectively learn and classify information by filtering inputs through successive layers.

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