

Deep Learning Challenge

Overview:

Alphabet Soup, a non-profit foundation, aims to develop an algorithm that can forecast the success of funding applicants. Leveraging your expertise in machine learning and neural networks, we are tasked with utilizing the dataset's attributes to build a binary classifier capable of predicting the likelihood of an applicant's success if they receive funding from Alphabet Soup.

Results:

To initiate the data processing, irrelevant information was eliminated. After removing EIN and NAME, the remaining columns were designated as features for the model. The NAME column was reintroduced in the second test phase for the purpose of binning. Subsequently, the data was divided into training and testing sets. The target variable, labeled "IS_SUCCESSFUL," was assigned the value of 1 for "yes" and 0 for "no." The APPLICATION data was examined, and the "CLASSIFICATION" value was employed for binning. By setting certain data points as a threshold, infrequent variables were grouped together and assigned a new value of "Other." Categorical variables were encoded using the `get_dummies()` function after verifying the success of binning.

Compiling, Training, and Evaluating the Model:

After applying neural networks, each model consisted of a total of three layers. The number of hidden nodes in each layer was determined by the number of features present. In total, 435 parameters were generated by the three-layer training model. The initial attempt yielded an accuracy slightly above 73%, which fell slightly short of the desired 75% threshold but remained within a reasonable range.

Optimization:

In the second attempt, incorporating the "NAME" column in the dataset led to an accuracy of nearly 79%. This exceeded the target of 75% by 4%, utilizing 3,298 parameters. Deep learning models benefit from employing multiple layers as they enable the model to learn and classify information by iteratively processing inputs through successive layers of computation.