

Charity-Funding-Success-Predictor using Deep Learning Algorithms

Deep Learning Project by Mano chitra Kumar

Overview:

The non-profit foundation Alphabet Soup wants to create an algorithm to predict whether applicants for funding will be successful. The scope of this project is to create a binary classifier that is capable of predicting whether applicants will be successful if funded by Alphabet Soup. For this purpose, we will be relying on machine learning and neural network algorithms and using the features in the provided dataset.

RESULTS:

Data Preprocessing

What variable(s) are neither targets nor features, and should be removed from the input data?

- Removed the EIN and NAME features

What variable(s) are considered the target(s) for your model?

- IS_SUCCESSFUL feature is the target

What variable(s) are considered to be the features for your model?

- After performing one-hot encoding to convert categorical data to numerical data, the columns in the dataframe apart from the target column were considered to be the features for the model.

Compiling, Training, and Evaluating the Model

How many neurons, layers, and activation functions did you select for your neural network model, and why?

- 2 hidden layers with 'relu' activation function and 1 output layer with sigmoid activation function were used.

Were you able to achieve the target model performance?

- After the initial analysis with just removing 'EIN' and 'NAME' features, the accuracy was only 0.728 (~73%) which was less than the desired 75%.

What steps did you take to try and increase model performance?

- To start with, the performance of the model was checked by dropping 'SPECIAL CONSIDERATIONS' feature along with 'EIN' and 'NAME'. This did not contribute to a better accuracy.
- So, only 'EIN' and 'SPECIAL CONSIDERATIONS' features were dropped, and 'NAME' was added back into the dataset.
- Also, the model was tested against different combination of relu, tanh, and sigmoid activation functions with different dense layers and units from 1-60 neurons in the first layer, hidden layers (each between 1-50 neurons), and an output layer.

Summary:

In the initial testing, the neural network model demonstrated an accuracy of 73% for predicting charity success, which provides Alphabet Soup with additional information on which charities to fund moving

forward. But after further optimizations with including the 'NAME' feature in the dataset, increased the accuracy from 73% to 78%, which was more than the desired predictive accuracy.

Future Directions:

Additional preprocessing or including more data, conducting further testing to look for the variance can be performed in the future. To adjust the model further either PCA or tSNE can be employed to reduce the number of features and increase the computing power of the model.