AlphabetSoupCharity Report

Overview:

The objective of this endeavor is to devise a machine learning algorithm and employ neural networks to forecast the likelihood of applicants achieving success when they receive funding from the fictional non-profit organization, Alphabet Soup.

Results:

**Deep Learning Attempt**APPLICATION\_TYPE cutoff = 275  
CLASSIFICATION cutoff = 1500  
layer1 = 80 : activation function = relu  
layer2 = 30 : activation function = relu

Epochs: 100

Loss: 0.5542781949043274, Accuracy: 0.7243148684501648

A loss value of 55.4% suggests room for further optimization in the model. The accuracy rate indicates that 72.4% of the model's predictions are in agreement with the actual values within the original dataset. To achieve a 75% accuracy target, certain adjustments are necessary.

**This is Optimization Attempt #1**APPLICATION\_TYPE cutoff = 10  
CLASSIFICATION cutoff = 100  
layer1 = 50 : activation function = relu  
layer2 = 12 : activation function = relu

Epochs: 100

Loss: 0.5522711277008057, Accuracy: 0.7255976796150208

After adjusting the cutoffs and neurons a loss value of 55.2% suggests room for further optimization in the model. The accuracy rate indicates that 72.5% of the model's predictions are in agreement with the actual values within the original dataset. To achieve a 75% accuracy target, certain adjustments are necessary.

**This is Optimization Attempt #2**APPLICATION\_TYPE cutoff = 50  
CLASSIFICATION cutoff = 10  
layer1 = 100 : activation function = sigmoid  
layer2 = 42 : activation function = sigmoid

Epochs: 75

Loss: 0.5742185711860657, Accuracy: 0.724781334400177

After adjusting the cutoffs, neurons, activation function, epochs, and dropping the ORGANIZATION column a loss value of 57.4% suggests room for further optimization in the model. The accuracy rate indicates that 72% of the model's predictions are in agreement with the actual values within the original dataset. To achieve a 75% accuracy target, certain adjustments are necessary.

**This is Optimization Attempt #3**APPLICATION\_TYPE cutoff = 100  
CLASSIFICATION cutoff = 100

layer1 = 99 : activation function = tanh  
layer1 = 33 : activation function = relu  
layer2 = 11 : activation function = sigmoid

Epochs: 125

Loss: 0.5551036596298218, Accuracy: 0.7269970774650574

After adjusting the cutoffs, neurons, activation function, epochs, and adding another layer a loss value of 55.5% suggests room for further optimization in the model. The accuracy rate indicates that 72.7% of the model's predictions are in agreement with the actual values within the original dataset. To achieve a 75% accuracy target, certain adjustments are necessary.

Summary:

Across my three attempts, the model fell short of surpassing a predictive accuracy of 72.7%. Even after applying hyperparameter tuning, there was negligible enhancement. Exploring an alternative classification model might be worth considering to better predict the success of applicants funded by Alphabet Soup. If you're looking to improve predictive accuracy for the same problem you could consider using a Random Forest classifier as an alternative to the neural network model. This forest classifier combines multiple decision trees to help reduce overfitting and improve generalization.