

1. The purpose of this analysis is to build a neural model to predict if the application will be successful in securing fundings.

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

* The target variable for the model is IS_SUCCESSFUL, which is a binary variable indicating whether the application was successful (1) or not (0).

*What variable(s) are the features for your model?

APPLICATION_TYPE, AFFILIATION, CLASSIFICATION, USE_CASE, ORGANIZATION, INCOME_AMT, STATUS, SPECIAL_CONSIDERATIONS, ASK_AMT, SPECIAL_CONSIDERATIONS

* What variable(s) should be removed from the input data because they are neither targets nor features?

EIN is a unique identifier and does not contribute predictive value.

NAME is a textual identifier and does not provide any useful features for prediction.

Neurons, Layers, and Activation Functions:

- Number of Layers: Three hidden layers were used.

Layer 1: 150 neurons

Layer 2: 23 neurons

Layer 3: 15 neurons

The goal was to achieve an accuracy of 75% or higher.

- Achieved Performance: The model achieved an accuracy of approximately 75% during training, which meets the target performance. However, further optimization could improve the performance.

Steps Taken to Increase Model Performance:

Combined rare categories for APPLICATION_TYPE and CLASSIFICATION variables into an "Other" category to reduce the number of unique categories and avoid overfitting on rare categories.

3. Overall Results: The deep learning model performed reasonably well, achieving an accuracy of around 75%. Data preprocessing steps like encoding categorical variables and scaling continuous

variables were essential in improving model performance. Regularization techniques such as dropout and batch normalization also helped improve the stability and generalization of the model