**Report on the Neural Network Model**

**Overview of the analysis:**

The purpose of this analysis is to summarize the overall results of the original deep learning model, which involves evaluating its performance metrics such as accuracy, precision, recall, and F1 score. Additionally, the analysis will also look at the alternative approach for the second model and will end up recommending the best model to use while looking at evidence.

**Results:**

* Data Preprocessing:
  + What variable(s) are the target(s) for your model?

The target variable for my model is “IS\_SUCCESSFUL” which provided insight into the success or failure of previous projects.

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

The feature variables include APPLICATION\_TYPE, AFFILIATION, CLASSIFICATION, USE\_CASE, ORGANIZATION, STATUS, INCOME\_AMT, SPECIAL\_CONSIDERATIONS, and ASK\_AMT.

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

EIN and NAME which were dropped because they are identifiers and do not provide predictive information and that’s why it is neither targets nor features.

* Compiling, Training, and Evaluating the Model
  + How many neurons, layers, and activation functions did you select for your neural network model, and why?

For my neural network model , I have 100 neurons in the first hidden layer and 40 neurons in the second hidden and 1 neuron in the output layer. The first and second hidden layers use the “Relu” activation function, while the output layer uses the “sigmoid” activation function.

A screenshot of a computer

Description automatically generated**Original:**

**Mine:**

A screenshot of a computer program

Description automatically generated

* + Were you able to achieve the target model performance?

Yes, with a result of 76% accuracy.

* + What steps did you take in your attempts to increase model performance?

Including the 'NAME' column among the feature variables helped enhance the accuracy by providing additional crucial data points. Increasing the number of hidden nodes for each layer resulted in an overall improvement in the model's accuracy.

**Summary:**

The deep learning model achieved an overall accuracy of 76% in classifying the data. While this accuracy may be satisfactory for some applications, there is still room for improvement. One recommendation for potentially improving the classification performance is to explore the use of different activation functions for the hidden layers and adding or reducing the number of epochs to the training regimen.