1. **Overview of the Analysis**

From Alphabet Soup’s business team, I received a CSV containing more than 34,000 organizations that have received funding from Alphabet Soup over the years. The challenge was to build a neural network binary classifier to predict if charities will be successful if they receive funding. To do this, I employed the TensorFlow Keras Sequential model with Dense hidden layers and a binary classification output layer and optimize this model by varying one or more of the nine features.

1. **Results**

* Data Preprocessing
  + What variable(s) are the target(s) for your model? **Target Variable**: **IS\_SUCCESSFUL**
  + What variable(s) are the features for your model? **Feature Variables**: **APPLICATION\_TYPE, AFFILIATION, CLASSIFICATION, USE\_CASE, ORGANIZATION,  STATUS, INCOME\_AMT, SPECIAL\_CONSIDERATIONS, ASK\_AMT**
  + What variable(s) should be removed from the input data because they are neither targets nor features? **EIN, NAME**
* Compiling, Training, and Evaluating the Model
  + How many neurons, layers, and activation functions did you select for your neural network model, and why?

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| --- | --- | --- |
| Parameter | Value/Activation Function | Justification |
| Number of Neurons | 44, 39 | This was a match to the number of columns created after calling the get\_dummies() function. |
| Number of Hidden Layers | 2 Layers/ relu | Simple choice for training with good performance. |
| Number of Output Layers | 1 Layer/ sigmoid | Provides a probability output (value between 0 and 1) for the classification of IS\_SUCCESSFUL. |

* + Were you able to achieve the target model performance? **I obtained the following results: Loss: 0.5547; Accuracy: .7274**
  + What steps did you take in your attempts to increase model performance? **I tried to bin the ASK\_AMT, drop the STATUS FEATURE and increase the number of inputs, but I ultimately did not achieve a test accuracy score of 75%. My last attempt with binning ASK\_AMT resulted in model loss of .556 and model accuracy of .728.**

1. **Summary**

In summary, we could not achieve the target accuracy of 75% and finished with an accuracy of 73%. A possible alternative model could be the to use Random Forest Classifier. This model is used for binary classification and may be advantageous in that there are less parameters to optimize and those which do require attention are more intuitive than those in a neural network.