

Report on the Neural Network Model

For this part of the Challenge, you'll write a report on the performance of the deep learning model you created for AlphabetSoup.

The report should contain the following:

1. **Overview** of the analysis:

The primary purpose of this analysis is to be able to predict if an applicant will be successful, based on Alphabet Soup application type, sector of industry, organization classification, use case for funding, organization type, active status, income classification, special consideration for application, and funding amount requested. These are the data columns that had to be cleaned up. Also, the final analysis was achieved from using Machine Learning techniques such as keras and neuron layers to train, fit and evaluate the models.

2. **Results:** Using bulleted lists and images to support your answers, address the following questions.

- Data Preprocessing

- What variable(s) are considered the target(s) for your model? The target is the row that reads "Is_successful"

```
: APPLICATION_TYPE      17
AFFILIATION             6
CLASSIFICATION          71
USE_CASE                 5
ORGANIZATION            4
STATUS                   2
INCOME_AMT              9
SPECIAL_CONSIDERATIONS  2
ASK_AMT                  8747
IS_SUCCESSFUL           2
dtype: int64
```

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

The features of the model are called: APPLICATION_TYPE, AFFILIATION, CLASSIFICATION, USE_CASE, ORGANIZATION, STATUS, INCOME_AMT, SPECIAL_CONSIDERATIONS and ASK_AMT.

- What variable(s) are neither targets nor features, and should be removed from the input data? They were EIN and NAME.
- Compiling, Training, and Evaluating the Model
 - How many neurons, layers, and activation functions did you select for your neural network model, and why?

I decided to use three layers, one neuron unit originally for the first two trial versions then tested with two neurons to improve my accuracy. For the activation functions, I used RELU and SIGMOID because they are reliable and stable to follow through with the epoch testing.

- Were you able to achieve the target model performance?

Unfortunately, I was not able to achieve the performance accuracy of above 73% even with changing out the neuron inputs and layers.

- What steps did you take to try and increase model performance? The steps taken were: I added another layer to my set and it did not increase the accuracy as I had projected it to. Also, the neuron units increased to two units and it still did not increase model performance.

3. **Summary:** Summarize the overall results of the deep learning model. Include a recommendation for how a different model could solve this classification problem, and explain your recommendation.

Overall, the attempts that were taken for this model were fairly close in accuracy percentage. For the next time, I would use another model like Random Forest or Regression to see if it will bring a more significant accuracy percentage increase.