**Deep Learning Challenge**

**Overview:**

The non-profit foundation Alphabet Soup wants to create an algorithm to predict whether applicants for funding will be successful. With knowledge of machine learning and neural networks, we must use the features in the provided dataset to create a binary classifier that can predict whether applicants will be successful if funded by Alphabet Soup.

**Results**:

Data processing was initially started by dropping the columns of EIN and Name. This meant the remaining columns could be used as features. The data was then split for training and testing sets. The target variable was labelled and had values of 1 for yes and 0 for no. The data from the application column was looked at and the classification column used to create bins. Each column was assessed to see the optimal value to be used to create each bin, with any categories below this value being put into the ‘Other’ bin.

Compiling, Training, and Evaluating the Model:

There were two hidden layers used for each model with activation ‘RELU,’ while the output layer was put under activation ‘SIGMOID.’ The model created 5981 parameters, which eventually gave an accuracy of 72.9% accuracy.

A screenshot of a computer program

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Optimization:

I attempted a few methods to optimise the model by attempting to change the number of neurons in the hidden layer and changing the activation function. After optimisation, the model achieved an accuracy of 78.5%, with only the EIN column removed and the NAME column put into bins. The model created 38221 parameters.

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Summary

To summarise, I was able to achieve the threshold set for accuracy, however I felt that the acuracy could be improved even further if more time could be given to run multiple tests, removing and including columns, increasing or decreasing the neuron amounts would help while increasing the epoch would give more chance to further the machine learning however it would take a longer time to achieve the results.