**Deep Learning Project**

**Overview Of the Analysis:**

The purpose of this analysis is to create a deep learning model using a neural network to predict the success of funding applications for Alphabet Soup, a charitable organization. The model aims to classify whether an organization will be successful or not in receiving funding based on various features.

**Data Preprocessing:**

The features for the model include the following columns from the dataset: “APPLICATION\_TYPE”,“AFFILIATION”, “CLASSIFICATION”, “USE\_CASE”, “ORGANIZATION”, “STATUS”, “INCOME\_AMT”, “SPECIAL\_CONSIDERATIONS” and “ASK\_AMT”.

The “EIN” and “NAME” column is removed from the input data as it is neither a target nor a feature.

**Compiling, Training, and Evaluating the Model:**

* The neural network model consists of three layers: two hidden layers and an output layer.
* The first hidden layer has 9 neurons, the second hidden layer has 18 neurons, and the output layer has 1 neuron.
* The activation function used in the hidden layers is the ReLU (Rectified Linear Unit) activation function, which helps introduce non-linearity to the model.
* The output layer uses the sigmoid activation function to produce a binary classification output.
* The model was trained for 80 epochs with a validation split of 15%.
* The training model achieved an accuracy of 72% which was under the desired 75%.

A screen shot of a computer program

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A screen shot of a computer code

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A screenshot of a computer program

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This model created 649 parameters.

**Optimization:**

In the second model, “NAME” is added back to the data set. This time I achieved 78.7% which is approximately 4% over the target with 4276 parameters.

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The deep learning model performed reasonably well with an accuracy of 78.7% on the test data. It shows promising results in predicting the success of funding applications based on the provided features.

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