**Report on Neural Network Model:**

**Overview:**

The goal of this module was to use machine learning and neural networks to predict whether an applicant will be successful if funded by Alphabet Soup.

**Results:**

**Data Preprocessing**

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

Is\_successful int 64

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

APPLICATION\_TYPE object

AFFILIATION object

CLASSIFICATION object

USE\_CASE object

ORGANIZATION object

STATUS int64

INCOME\_AMT object

SPECIAL\_CONSIDERATIONS object

ASK\_AMT int64

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

EIN and NAME should be removed since they are not target or feature variables.

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

* **How many neurons, layers, and activation functions did you select for your neural network model, and why?**

2 hidden layers were used. Attempt 1 used a hidden layer 8,5 and achieved 74% accuracy. Attempt 2 used a hidden layer 16,10 and achieved 74% accuracy. Attempt 2 used a hidden layer 30, 15 and achieved 74% accuracy.

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

No, target was 75%.

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

I attempted to use different hidden layers to increase model performance.

**Summary:**

The model did not achieve the 75% target accuracy. The highest accuracy achieved was 73% of the three model attempts. The ‘ein’ and ‘name’ columns were removed from the data frame, and two hidden data layers were used using Relu and Sigmond activation functions.

Using multiple hidden layers for each model didn’t result in a significant difference in accuracy. By adding back in feature columns, you could optimize accuracy.