***Neural Network Model Performance Report***

**Overview**

This report assesses the performance of the deep learning model created for Alphabet Soup, which predicts funding application success. Key aspects of the analysis include data preprocessing, model details and performance.

**Results**

**Data Preprocessing**

Target Variable: The target variable for our model is "IS\_SUCCESSFUL." It indicates whether a funding application was successful (1) or not (0).

Features: The features used in the model include various columns from the input data, such as "APPLICATION\_TYPE," "AFFILIATION," "CLASSIFICATION," "USE\_CASE," "ORGANIZATION," "INCOME\_AMT," "SPECIAL\_CONSIDERATIONS," and "ASK\_AMT."

Variables Removed: "EIN" and "NAME" columns from the input data as they do not provide relevant information for predicting the success of funding applications.

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

Model Architecture: Neurons and Layers: The neural network model consisted of two hidden layers. The first hidden layer contained 80 neurons, while the second had 30 neurons. These choices were based on experimentation to balance model complexity and performance.

Activation Functions: ReLU (Rectified Linear Unit) activation function for both hidden layers to introduce non-linearity and aid in feature extraction. For the output layer, a sigmoid activation function was employed for binary classification (0 or 1).

**Model Performance**

Target Performance: Defined accuracy and loss goals.

Achieved Performance: ~73.38% accuracy, loss of 0.5573.

**Summary**

The deep learning model performs reasonably well with 73.38% accuracy. To improve, explore ensemble methods, hyperparameter tuning, and feature engineering. Consider alternate models like Random Forest.