Report on the Neural Network Model

<u>Overview of the analysis: Explain the purpose of this analysis.</u>

The purpose is to create a binary classifier that predicts whether applicants for funding from Alphabet Soup will be successful if funded. By leveraging machine learning techniques, particularly neural networks, the goal aims to develop a predictive model that can accurately classify new applicants into successful or unsuccessful categories based on characteristics.

<u>Data Preprocessing</u>

The dataset contains information on more than 34,000 organizations that have received funding from AlphabetSoup with various metadata such as application_type, affiliation, organization classification...

What variable(s) are the target(s) for your model?
"IS_SUCCESSFUL" was the target variable model, which helped indicate whether the funding provided to an organization was used effectively.

What variable(s) are the features for your model?
Feature variables for the model included:

- **EIN** and **NAME**—Identification columns

- **APPLICATION_TYPE**—Alphabet Soup application type

- **AFFILIATION**—Affiliated sector of industry

- **CLASSIFICATION**—Government organization classification

- **USE_CASE**—Use case for funding

- **ORGANIZATION**—Organization type

- **STATUS**—Active status

- **INCOME_AMT**—Income classification

- **SPECIAL_CONSIDERATIONS**—Special considerations for application

- **ASK_AMT**—Funding amount requested

What variable(s) should be removed from the input data because they are neither targets nor features?
I removed EIN and NAME variables as they do not provide predictive value and is solely for identification purposes.

Compiling, Training, and Evaluating the Model

How many neurons, layers, and activation functions did you select for your neural network model, and why?
The neural network model consists of two hidden layers with 8 and 5 neurons, and one output layer with 1 neuron.

Were you able to achieve the target model performance?
Using the test data, the model's performance resulted in an accuracy of approximately 72.51% and a loss of 0.5623.

Summary:
The provided deep learning model achieved a moderate level of performance with an accuracy of approximately 72.51% on the test data. It's essential to evaluate the model's performance using appropriate metrics and possibly iterate through multiple iterations of experimentation and refinement to achieve the desired level of performance for the classification problem at hand.