Charity Funding Predictor

***Overview*:** In this analysis, I took data from the non-profit foundation Alphabet Soup to create an algorithm in order to predict an applicant’s chance of receiving funding. In this model, I used Deep Learning conduct the predictive analysis.

***Data Preprocessing:***

Variables Used In Analysis:

* **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 consideration for application
* **ASK\_AMT**—Funding amount requested
* **IS\_SUCCESSFUL**—Was the money used effectively (Target Variable)

**Variables Removed From Analysis:**

* **EIN**
* **Name**

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

**Model 1:**

**Table

Description automatically generated**

**Model 2:**

**Table

Description automatically generated**

**Model 3:**

**Table

Description automatically generated**

In the first model, I decided to use two hidden layers with utilizing eight hidden nodes in layer 1 and five hidden nodes in layer 2. I chose to use activate these layers with the Relu activation because in my experience the Relu model has been more accurate than the Sigmoid. My initial intention was to keep it simple with two hidden layers to see the results I would achieve. In Model 1, I achieved a 72.5% accuracy, so I decided in Model 2 to add an additional model layer to see if that would help with the efficacy of the model. Sadly, the results stayed similarly. For Model 3, I decided to try to decrease the parameters to gauge if that would increase performance. I did this by dropping the SPECIAL\_CONSIDERATIONS and AFFILIATION columns as I felt these variables are the least relevant categorical data. However, after dropping these two columns, the accuracy dropped to 65%.

With this model of determining if loans will be approved, it is relatively accurate, but not reliable in determining the accuracy. The issue I see are the following: 1) credit worthiness of the individuals asking for loans 2) if they have been approved before. These two factors would help improve the efficacy of the model because lenders do not want to give to unproven borrowers.