# Neural Networks

## Data Processing

* The dataset removed irrelevant information such as ‘EIN’ and ‘NAME’ from the model. The remaining columns served as features for the model.
* CLASSIFICATION and APPLICATION\_TYPE was replaced with ‘other’ due to high fluctuation. The data was split into training and testing sets of data.
* The target variable for the model is “IS\_SUCCESSFUL” and is verified by the value, yes is defined as 1 and no is defined as no.
* Each unique value used several data points as a cutoff point to bin “rare” categorical variables together in a new value defined as ‘other’.
* Categorical variables were encoded by ‘pd.get\_dummies()’.

## Compiling, Training, and Evaluation the Model

Neural networking was implemented in both three-layer models. The number of features dictated the number of hidden nodes.

A computer screen shot of a program

Description automatically generated

The first three-layer training model generated 438 parameters with 72.73% accuracy– falling approximately 2% under the desired 75% accuracy.

A screenshot of a computer program

Description automatically generatedA screen shot of a computer

Description automatically generated

## Optimization

The second model achieving 72.35% accuracy. Deep learning models require multiple layers to teach computers to filter inputs through the layers and predict and classify information.