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Dataviz Bootcamp

Deep Learning

Charity Funding Model Analysis

**Overview:**

The purpose of this analysis was to create a model using neural networks to predict what applicants for funding through Alphabet Soup nonprofit foundation, have the best chance of success.

**Results:**

* First the csv file was read into Pandas and then preprocessing the data can begin.
  + Columns that were not beneficial were dropped (EIN and Name column)
  + Determining the number of unique values in each column
  + Choosing a cutoff point and grouping values together into a column called “Other”.
  + Converted categorical data into numeric.
  + Divided the data into target array (IS\_SUCCESSFUL) and features array.
  + Create testing and training dataset.
  + Scaled the training and testing sets.
* The target variable, y, was IS\_SUCCESSFUL and there were 44 features variables.
* Three attempts using neural networks were made to try and achieve the target accuracy of higher than 75%. However, all three models generated accuracy rates of around 72%.
  + Attempt 1:
    - This attempt results in an accuracy score of 72.5%, which means 72.5% of the models predicted values align with true values.
    - 2 layers were used.
      * Layer 1: 10 neurons
      * Layer 2: 20 neurons
      * Activation for both was ‘relu’
    - Plotted the accuracy: A graph with blue lines

      Description automatically generated
  + Attempt 2:
    - This attempt resulted in an accuracy of 72.3%. This was the lowest accuracy.
    - 3 layers were added to try and optimize the model.
      * Layer 1: 10 neurons
      * Layer 2: 20 neurons
      * Layer 3: 30 neurons
      * Activation for all three was ‘relu’
    - Plotted accuracy: A graph with blue lines

      Description automatically generated
  + Attempt 3:
    - This attempt resulted in an accuracy of 72.6%, which was the highest accuracy of all three attempts.
    - In this attempt the layers and number of neurons were the same as the first attempt, the change here was the activation for both layers was ‘tanh’.
    - Plotted accuracy:A graph with blue lines

      Description automatically generated

**Summary:**

In the three attempts made to optimize the model, it was unable to achieve the target accuracy of 75% or higher and stayed at around 72.6%. Another model should be made to see if it is better at predicting if applicants will be successful if they received funding through Alphabet Soup.