

Report on the Neural Network Model

Overview:

- The purpose of this analysis was to design a neural network/deep learning model to create a binary classification model that can predict which organizations will be successful.

Results:

- Data Processing:

- The variable 'IS_SUCCESSFUL' was the target for the model.
- The variables 'APPLICATION_TYPE', 'AFFILIATION', 'CLASSIFICATION', 'USE_CASE', 'ORGANIZATION', 'STATUS', 'INCOME_AMT', 'SPECIAL_CONSIDERATIONS', and 'ASK_AMT' were the features for the model.
- The variables 'EIN' and 'NAME' were removed from the input data because they were neither targets nor features, as they were identification columns.

- Compiling, Training, and Evaluating the Model:

- I used two layers, one with 80 neurons and another with 30 neurons. Both layers used a ReLU activation function. I based my decision about the layers on the output given in the starter code, and I chose a ReLU function because it is commonly used in hidden layers.
- This model was not able to achieve the target model performance.
- I tried increasing and decreasing the number of neurons, the number of layers, and the number of epochs, to see if it would improve the model. None of these attempts worked.

Summary:

- The initial model's loss was 0.556824 the accuracy was 0.726880, which did not meet the target model performance of 75%. To optimize the model the number of neurons, the number of layers, and the number of epochs were both increased and decreased. None of the optimization techniques improved the model, except for decreasing the number of neurons, which increased the accuracy by 0.000816. Given that none of the optimization techniques worked, I would suggest trying a different activation function, as well as toggling the number of neurons.

Initial model output:

268/268 – 0s – loss: 0.5568 – accuracy: 0.7269 – 445ms/epoch – 2ms/step
Loss: 0.5568243265151978, Accuracy: 0.7268804907798767

Best optimization output:

268/268 – 1s – loss: 0.5543 – accuracy: 0.7277 – 509ms/epoch – 2ms/step
Loss: 0.5542727112770081, Accuracy: 0.7276967763900757