

Overview

The purpose of this analysis is to create a model that will help Alphabet Soup determine if applicants for funding will be successful or not; with historical data containing quantitative and qualitative values we are going to determine which values are pertinent to be used as features and what is the target value we are looking at.

Results

This are the details for the First Model

FEATURES	TARGET	Model Spec
'APPLICATION_TYPE', 'AFFILIATION', 'CLASSIFICATION', 'USE_CASE', 'ORGANIZATION', 'STATUS', 'INCOME_AMT', 'SPECIAL_CONSIDERATIONS', 'ASK_AMT',	IS_SUCCESSFUL (YES OR NO)	3 Layers, Units: 50 > 25 > 1

Model: "sequential"

Layer (type)	Output Shape	Param #
=====		
dense (Dense)	(None, 50)	2300
dense_1 (Dense)	(None, 25)	1275
dense_2 (Dense)	(None, 1)	26
=====		
Total params: 3,601		
Trainable params: 3,601		
Non-trainable params: 0		

```
nn = tf.keras.models.Sequential()

# First hidden Layer
nn.add(tf.keras.layers.Dense(units=50, activation="relu", input_dim=len(X_train_scaled[0])))

# Second hidden Layer
nn.add(tf.keras.layers.Dense(units=25, activation="relu"))

# Output Layer
nn.add(tf.keras.layers.Dense(units=1, activation="sigmoid"))

# Check the structure of the model
nn.summary()
```

Results:

Loss: 0.559521496295929, Accuracy: 0.7278134226799011

After the first model we decided to do different iterations and try different models and combination of features

Here are the details to the 3 models we try afterwards:

MODEL	FEATURES	TARGET	MODEL Spec.
1	'APPLICATION_TYPE', 'AFFILIATION', 'CLASSIFICATION', 'USE_CASE', 'STATUS', 'INCOME_AMT', 'ASK_AMT',	IS_SUCCESSFUL (YES OR NO)	2 layers Units: 50 > 1 relu > sigmoid
2	'APPLICATION_TYPE', 'AFFILIATION', 'CLASSIFICATION', 'USE_CASE', 'STATUS', 'INCOME_AMT', 'ASK_AMT',	IS_SUCCESSFUL (YES OR NO)	3 layers Units: 25 > 50 > 1 relu>softsign>sigmoid
3	'APPLICATION_TYPE', 'AFFILIATION', 'CLASSIFICATION', 'USE_CASE', 'STATUS', 'INCOME_AMT', 'ASK_AMT',	IS_SUCCESSFUL (YES OR NO)	3 layers Units: 25 > 50 > 1 selu>selu>sigmoid

This is how the models performed

	Model	Model Loss	Model Accuracy
0	1	0.557543	0.729329
1	2	0.555614	0.730029
2	3	0.555962	0.728163

Using different features, and reducing the numbers of unique values for other in combination with different models using different number of layers, and activation modes; we were able to achieve better results. This points to a good direction and with more time and iteration we should be able to find a model that provides higher accuracy.

Given that 75% accuracy was not achieved no-new model has been saved.