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4/7/2024

# Deep Learning & Neural Networks

## Project: Charity Funding Predictor

Deep Learning & Neural Networks are being used to test the success of applicant's funding by Alphabet Soup, who funded over 34,000 organizations.

### Data Processing

EIN & NAME were dropped from the table, as it was irrelevant, but after a point APPLICATION\_TYPE & CLASSIFICATION was becoming irrelevant due to high fluctuation in the data. After creating an numerically-converted database, the data was split into training and testing models, of which the target variable is "IS\_SUCCESSFUL" and verified by the value – 1 for yes & 0 for no.

### Compiling, Training and Evaluating the Model

I have added three neural network layers, of which the number of features dictated the number of hidden holes

```
# Define the model - deep neural net, i.e., the number of input features and hidden nodes for each layer.
number_input_features = len(x_train_scaled[0])
hidden_nodes_layer1=7
hidden_nodes_layer2=14
hidden_nodes_layer3=21

nn = tf.keras.models.Sequential()

# First hidden layer
nn.add(tf.keras.layers.Dense(units=hidden_nodes_layer1, input_dim=number_input_features, activation='relu'))

# Second hidden layer
nn.add(tf.keras.layers.Dense(units=hidden_nodes_layer2, activation='relu'))

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

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

Python

A three-layer model generated 505 parameters, which garnered me 73% accuracy

```
[17]:
... Model: "sequential"

Layer (type)                 Output Shape              Param #
=====
dense (Dense)                 (None, 7)                 378
dense_1 (Dense)               (None, 14)               112
dense_2 (Dense)               (None, 1)                15
=====
Total params: 505 (1.97 KB)
Trainable params: 505 (1.97 KB)
Non-trainable params: 0 (0.00 Byte)
```

268/268 - 0s - loss: 0.5523 - accuracy: 0.7303 - 363ms/epoch - 1ms/step  
Loss: 0.5522661209106445, Accuracy: 0.7302623987197876