**Write a Report on the Neural Network Model**

For this part of the Challenge, you’ll write a report on the performance of the deep learning model you created for AlphabetSoup.

The report should contain the following:

1. **Overview** of the analysis: Explain the purpose of this analysis.

Purpose of this analysis is to build a machine learning model for nonprofit organization Alphabetsoup using historical data for previous funding to predict whether or not applicants for future funding will be successful.

1. **Results**: Using bulleted lists and images to support your answers, address the following questions.

* Data Preprocessing
  + What variable(s) are considered the target(s) for your model?

‘IS\_SUCCESSFULL’

* + What variable(s) are considered to be the features for your model?

‘APPLICATION\_TYPE', 'AFFILIATION', 'CLASSIFICATION', 'USE\_CASE', 'ORGANIZATION', 'STATUS', 'INCOME\_AMT', 'SPECIAL\_CONSIDERATIONS', 'ASK\_AMT', 'IS\_SUCCESSFUL'

* + What variable(s) are neither targets nor features, and should be removed from the input data?

‘EIN’ and ‘NAME’

* Compiling, Training, and Evaluating the Model
  + How many neurons, layers, and activation functions did you select for your neural network model, and why?

Total no of neurons : 111

Layers: 3

Activation functions: Relu, Sigmoid

I kept the no of neurons in between too low or too high to avoid underfitting or overfitting.

* + Were you able to achieve the target model performance?

No,

* + What steps did you take to try and increase model performance?

Attemp1: Dropping two non-beneficial columns 'STATUS' and 'SPECIAL\_CONSIDERATIONS' to improve accuracy

Attemp2: 1. Increased no of neurons in first hidden layer

2.reducing the number of epochs to the training regimen.

Attempt3: Adding more hidden layers

**Summary**: Summarize the overall results of the deep learning model. Include a recommendation for how a different model could solve this classification problem, and explain your recommendation.

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| **Attempt** | **Model Description** | **Results** |
| Initial Attempt | First hidden layer  units=80, activation="relu"  Second hidden layer  units=30, activation="relu"  Output layer  units=1, activation="sigmoid"  no of epoch - 100 | Loss: 0.5733078718185425,  Accuracy: 0.7207375168800354 |
| 1st attempt to optimize the model | [\*\*Deleted two additional columns 'STATUS'and'SPECIAL\_CONSIDERATIONS' ]  First hidden layer  units=80, activation="relu"  Second hidden layer  units=30, activation="relu"  Output layer  units=1, activation="sigmoid"  no of epoch - 100 | Loss: 0.5721405148506165, Accuracy: 0.7219045162200928 |
| 2nd attempt to optimize the model | Increased no of neurons in first hidden layer  reducing the number of epochs to the training regimen.  First hidden layer  units=320, activation="relu"  Second hidden layer  units=30, activation="relu"  Output layer  units=1, activation="sigmoid"  no of epoch - 50 | Loss:  0.5656766891479492,  Accuracy:  0.7245886325836182 |
| 3rd attempt to optimize the model | Adding more hidden layers increasing no of epoch  First hidden layer  units=45, activation="relu"  Second hidden layer  units=15, activation="relu"  Third hidden layer  units=15, activation="relu"  Output layer  units=1, activation="sigmoid"  No of epoch =75 | Loss:  0.5665891170501709,  Accuracy: 0.7226047515869141 |