A logo for college computing

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**Assessment Cover Page**

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| *Student Full Name* | Santhosh Shanmugasundaram |
| *Student Number* | Sba24100 |
| *Module Title* | Programming for AI |
| *Assessment Title* | CA1 |
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**Declaration**

By submitting this assessment, I confirm that I have read the CCT policy on academic misconduct and understand the implications of submitting work that is not my own or does not appropriately reference material taken from a third party or other source.

I declare it to be my own work and that all material from third parties has been appropriately referenced.

I further confirm that this work has not previously been submitted for assessment by myself or someone else in CCT College Dublin or any other higher education institution.

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# Introduction

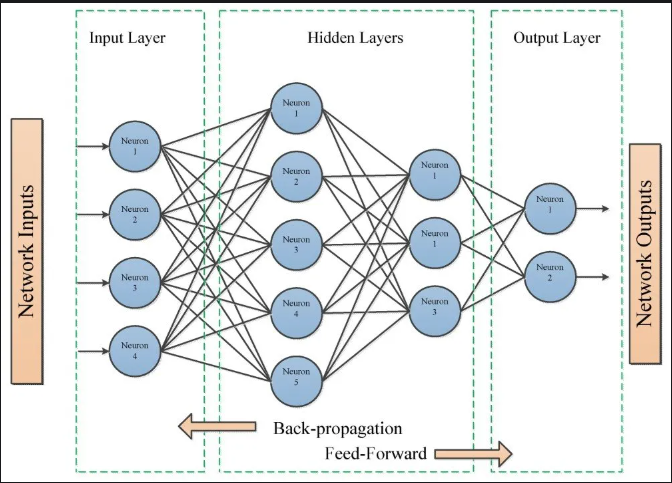
Artificial neural network is a machine learning model which is inspired by the biological neural networks of human brain on how information is processed. In a dense neural network system, there will be one input layer which receives data, one output layer that returns results and there can be 1 or many hidden layers between input and output layer. (Melanie)

Each layer is made up of neurons/nodes and each neuron/node in one layer is connected to the neurons in the previous and/or next layer. Each neurons combine inputs from a dataset with a weight factor and bias factor, to increase or decrease their value. In doing so, neural network system performs calculations.

In addition to neurons, layers, weights and bias, an activation function is performed at each node and a loss function at output nodes. Some of the most used activation functions are RELU, SIGMOID, SOFTMAX and etc. Some of the most used loss functions are ADAM, SGD.

During training of the model, forward propagation and backward propagation activities are performed which modifies the weight and bias factor consistently till model is ready. During testing/prediction phase, based on the weight and bias factors discovered earlier, only forward propagation activity is performed.

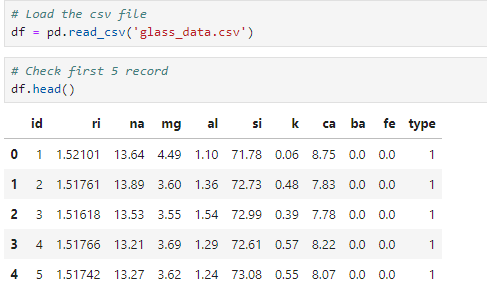
(Corpnce)



# Exploratory Data Analysis

Exploratory Data Analysis (EDA) is a critical step in the machine learning process. EDA provides a deep understanding of the data, enabling data scientists to make informed decisions and select the right algorithms for their machine learning projects. It involves examining datasets to uncover patterns, spot anomalies, and test hypotheses before moving on to model building.

## Understand the Dataset

Import the dataset using panda function (READ\_CSV), followed by displaying the top 5 rows using function ‘head’.   


.

## Calculate Correlation Matrix Using NumPy

coefficient.

# Dense Neural Network Model

**Scope**

.

# Hyperparameter Tuning

data.

## Connect

First

## Database

## Insert

Once

# Classification Report

length.

# References

(Melanie)

Melanie. “Dense Neural Networks: Understanding Their Structure and Function.” *Data Science Courses | DataScientest*, 5 Mar. 2024, datascientest.com/en/dense-neural-networks-understanding-their-structure-and-function.

Available at:

<https://datascientest.com/en/dense-neural-networks-understanding-their-structure-and-function>

(Corpnce)

Corpnce. “Corpnce.” *Corpnce*, 22 Dec. 2023, www.corpnce.com/5541-2/.

Available at:

https://www.corpnce.com/5541-2/

# GitHub Link

<https://github.com/santhosh-sba24100/CA1-Python_Programming>