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**Assessment Cover Page**

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| *Module Title: Higher Diploma Artificial Intelligence* |  |
| *Assessment Title: CA 2 – Programming for AI* |  |
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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.

Contents

[Q1 (25 marks) 1](#_Toc163909292)

[References 2](#_Toc163909293)

[Q2 (25 marks) 3](#_Toc163909294)

[References 3](#_Toc163909295)

[Q3 (10 marks) 4](#_Toc163909296)

[References 4](#_Toc163909297)

[Q4 (15 marks) 5](#_Toc163909298)

[References 6](#_Toc163909299)

[Q5 (25 marks) 7](#_Toc163909300)

# Introduction

Machine learning is a branch of Artificial Intelligence, where algorithms are used to facilitate computers to learn patterns and make predictions based on data, thereby implementing a process learned from the data through inference, model fitting and learning from example (Ayodete, 2010). In developing an approach to exploring and implementing machine learning projects it is useful to look at possible process models that put structure on knowledge discovery endeavors (Wirth and Hipp, 2000). CRISP-DM (Cross Industry Standard Process for Data Mining) is the de facto standard for Artificial Intelligence (Schröer, Kruse and Gómez, 2021). The model is sequential with the following steps:

The code for this assignment can be viewed at https://github.com/burnsjohn1/CCT-Dublin-Machine-Learning-CA1.

# Problem Description

The dataset presents a series of variables that describe the properties of glass. A taxonomy of glass types is also provided in the dataset with 7 different types of glass. This is a classification problem and the brief in this exercise is to build a classification model using a dense es a dense neural network.

# Objectives

The objectives are to develop a model in a structured fashion using the relevant components of the CRISP-DM methodology as follows:

* Explore and understand the data.
* Perform any data preparation necessary for input to the model
* Select and apply the model. In this case it will be a scalable dense neural network model based on the “type of Glass” attribute.
* Evaluate the results of the model

# Methodology

1. Business (Problem) Understanding - focuses on defining the problem to be addressed.
2. Data Understanding includes gathering of data and familiarization with the data.
3. Data preparation encompasses all the activities to develop the final dataset(s) that will be used as input to the modelling tools. Includes feature engineering, data consolidation and cleaning.
4. Modeling is the selection and application of the modeling methods chosen to meet project objectives. It includes model selection, training, and validation of models, tuning hyperparameters, developing visualisations and performance metrics.
5. Evaluation sees the model’s results evaluated in the light of the project objectives.
6. Deployment is the final step that sees the model used to meet the original project objectives.

Steps 2,3,4, and 5 are used for this project.

# Architecture diagram

# Explanation about configurations of neurons, layers, loss functions, and activation functions,

# Interpretation and discussion of findings

# References

     Wirth, R. and Hipp, J. (2000). CRISP-DM: Towards a Standard Process Model for Data Mining. In: *Proceedings of the Fourth International Conference on the Practical Application of Knowledge Discovery and Data Mini*. Fourth International Conference on the Practical Application of Knowledge Discovery and Data Mini. Great Britain: Practical Application Company, pp.29–40.

Schröer, C., Kruse, F. and Gómez, J.M. (2021). A Systematic Literature Review on Applying CRISP-DM Process Model. *Procedia Computer Science*, [online] 181(1), pp.526–534. Available at: https://www.sciencedirect.com/science/article/pii/S1877050921002416.