**ASSESSMENT 2:**

**K-Means Clustering**

**COMP3003**

**Machine Learning**

**2022/2023**

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# Introduction

The purpose of this study is to explore *supervised* and *reinforcement* machine learning techniques. The study will highlight the differences between these two methodologies, enabling a discussion into the variables and environments that influence the choice of using one technique over the other. The goal of this study is to build knowledge of

# Literature Review

**Topic**

* 1000 words
* Supervised learning techniques + 2 exampls (FOCUS)
* Reinforcement learning techniques + 2 examples
* SL focus, use RL to analyse differences

**What is a literature review?**

* Find existing research, theories and evidence – then discuss own critical evaluation and discussion
  + Summarise research and theories
  + Identify controversy and contested claims
  + Highlight gaps in research to date
* Recent developments: Popular approaches over time?
* Gaps/Weaknesses: what is missing from the literature?
* Pivotal publications: influential theories or studies?
* Controversy: where do sources disagree?
* Link to project: how will this research impact my project? Carried out BEFORE CODE
* Identify themes: concepts or question recurring across literature?

**Structure**

* Chronological? Did SL come before RL? Why? What were the impacts of this?
* Methodological? Two topics, variety research methods? Compare results and conclusions from multiple approaches?

**Point of my argument:**

Supervised and reinforcement learning

1. **Introduction to literature review**

* Introduce and define ML and goal of ML
* Introduce ML areas
* Introduce types of ML
* Introduce ML concerns
* Introduce Literature Review goals
* State what is included in the review and what isnt

Machine Learning (ML) is the most important component of Artificial Intelligence (AI), declared by Zhang (2020), and irrefutably so, as proven by ML’s omnipresence within all manners of modern industry. This is a reasonable deduction when the goals of ML are considered:

1. Automate decision making by analysing Big Data.
2. Reduce the burden on developers on writing extensive amounts code.

Jordan (2015) further outlines “healthcare, manufacturing, education, financial modelling, policing, and marketing” as the most prominent industries upon which ML decision-making has advanced.

Within the field of ML exist two paradigms: Supervised Learning (SL) and Reinforcement Learning (RL).

However, the advancement of this technology brought with it new concerns of ethics and reliability; Plasek (2016) asserts that the biggest errors within ML originate from poor choices of training data, building an argument that data can reflect systemic discriminations. This proves that ML is not a flawless technology that can be used

**2. Body (split into SL and RL)**

**2a. Supervised Learning with #1 and #2 examples**

**2b. Reinforced Learning with #1 and #2 examples**

* Give overview of main points of source – combine into a whole
* Add own interpretations of main points
* Discuss significance of findings in relation to the whole literature
* Mention strengths and weaknesses of source
* Connections, comparisons and contrasts

**3. Conclusion**

**3a. Summarize key findings and significance**

**3b. Differences between RL and SL**

# Implementation

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# Analysis

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# Discussions and Conclusions+6

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# Appendix

Code.m