CA6001 – AI Algorithms Fundamentals & Application Assignment Brief

Weightage: 50% of total course grade

Submission Format:

- **Group Project** (3–4 students per group)
- Deliverables:
    1. **Final Report** (max 10 pages)
    2. **Slides & Video Recording** (max 12 slides)

Assignment Overview

The project challenges you to identify a real-world problem that can be addressed using artificial intelligence. Your team will design, implement, and evaluate an AI-based solution that demonstrates both technical competency and ethical awareness. The project is an opportunity to apply the AI principles and algorithms covered in this course to create tangible, meaningful impact.

The dataset you choose can be any publicly available dataset from sites such as:

Kaggle - huge repository of community published data & code - https://www.kaggle.com/datasets

Data.world open datasets - https://data.world/datasets/open-data

Github Awesome Datasets - https://github.com/awesomedata/awesome-public-datasets

Singapore Statistics - https://www.singstat.gov.sg/

Singapore Government Published Dataset - https://data.gov.sg/dataset

UCI Machine Learning Repository - https://archive.ics.uci.edu/ml/datasets.php

Google's Dataset Search - https://datasetsearch.research.google.com/

Learning Outcomes (ILOs) Assessed

By completing this assignment, you will demonstrate your ability to:

1. **Explain** the principles behind core AI algorithms (ILO1)
2. **Compare and contrast** algorithms in terms of use cases and limitations (ILO2)
3. **Apply** AI algorithms to solve practical problems (ILO3)
4. **Analyze** datasets to justify algorithmic choices (ILO4)

5. **Implement** algorithms using programming tools (ILO5)
6. **Evaluate** model performance using appropriate metrics (ILO6)

Assessment Criteria

Component	Weight	Description
Problem Analysis & Solution Design	35%	Depth of understanding of the problem, relevance of AI principles, and appropriateness of chosen approach.
Technical Implementation & Performance	35%	Quality of implementation, correctness of algorithms, and demonstration of working results.
Presentation & Summary Report	20%	Clarity, structure, communication of findings, and use of visuals during presentation.
Peer Review	10%	Teamwork, contribution, and collaboration as evaluated by peers.

Grading Rubric

Standard	Description
High Standard (75–100%)	Comprehensive analysis and design; accurate application of AI principles; strong technical execution and demonstration; well-structured report and professional presentation.
Pass Standard (40–74%)	Reasonable analysis and design; basic application of AI concepts; demonstrable results; coherent presentation.
Fail Standard (0–39%)	Insufficient analysis or design; lack of understanding of AI principles; non-functioning implementation; weak or missing presentation/report.

Submission Guidelines

- Submit all files via the NTULearn by **Week 6, Friday, 11:59 PM**.

- Include all code, data (or data source links), and documentation in a compressed folder.

All work must comply with **NTU's Honour Code** and the principles of **academic integrity**.