Assessment Brief

Module title:	Artificial Intelligence and Neural Networks
Module code:	COM7019
Assignment title:	Artificial Intelligence and Neural Network Portfolio
Assignment format:	Formative
Word/time limit:	3000
File type	.docx file
Percentage of final grade	This assignment is worth 100% of your final grade for this module.
Submission deadline	See module iLearn page for date of submission
Grade release	You will normally receive your provisional grade and feedback within 20 working days of the submission deadline

Useful terms:

Learning outcomes (LOs)	The skills and knowledge that you should be able to show in your work.
Rubric/Marking Matrix	A set of rules or guidelines used to grade or assess work.

Task summary:

Description: The assignment is given as two tasks. Each task is to be answered individually, unless multiple components have been given.

- Task 1 is a data investigation designed to check your understanding of AI&NN methodologies for critical model analysis, through a real-world mini AI&NN project. All of which will be written in Python

- Task 2 is a report designed to give you the opportunity to demonstrate your AI&NN critical evaluation skills and ethical considerations, comprehensively written in an easily understandable manner, based upon your investigation.

A clear, concise analysis for all Tasks is to be given within the submission, complimented with screenshot evidence and written justification of all processes and results. **You are to submit a single Word document for all tasks and your code for Task 1 is to be included within an appendix, so that it can be checked and verified it is working correctly. Your student ID number must be clearly defined upon the uploaded file.**

Assignment instructions:

For this task, you must produce a data investigation (Task 1) and full report (Task 2).

Task 1 – Image Classification using MNIST Digits AI&NN Mini Project in Python

You just been hired as an Artificial Intelligence Analyst at a tech startup that builds automated document processing. Your line manager has asked you to build a neural network that can successfully read and classify from the MNIST dataset 28x28 grayscale images of handwritten digits (0-9), which has been given to you by your line manager.

Your goal is to construct a neural network model comprising of an input layer, six hidden layers and an output layer. As part of the comparative accuracy study of the model, you will implement the Sigmoid and Tanh activation functions within the hidden layers to determine the model's accuracy and performance in using each activation functions separately. The output layer will have 10 nodes, one for each digit (0-9) and include an additional activation function of your choice to critically analysis results, ensuring the model outputs a probability distribution over the 10-digit classes. The full investigation is to be written in Python

(70 Total marks)

(LO's: 1 & 2)

(1600 Word Equivalence for the code)

(500 words written Justification)

Task 2 – Critical evaluation report

After the successfully development of your neural network model, the final step requires you to conduct a critical evaluation of the project. You will assess the outcomes of your model and address any ethical and moral issues that you believe may arise from deploying a neural network system in varying practical applications. Your evaluation should be comprehensive, considering both the technical performance and the broader impact of the system, such as end-users, clients and society before general release.

(30 Total marks)

(900 Words)

(LO's: 3 & 4)

Learning outcomes (LO)

By completing this assessment, you will have shown and be assessed on **all** four of the learning outcomes:

1. Critically examine Artificial Intelligence Techniques. LO 1

2. Apply Artificial Intelligence techniques and tools for a given scenario and assess the outcomes. LO 2

3. Appraise the ethical impact of AI in a local and global context and propose appropriate mitigations. LO 3

Graduate attribute:

4. Evaluate and apply digital tools and / or services while critically reflecting on opportunities for developing novel digital capabilities. Identify, select, plan for, use, modify and evaluate digital applications and strategies to enhance the achievement of aims and desired outcomes. LO4

You will be graded based on how well you meet these learning outcomes. Your marker will use a rubric/marking matrix to grade your work, and you can find this on the "My Assessment" tab on the module iLearn page.

Guidelines and policies

You can find links to more useful information about the assignment and university policies below.

Word/time limit policy

Click here to view the Arden University word count/time limit policy

Referencing guidelines

Click here for APA referencing guidelines

Please follow the referencing guidelines that are appropriate for your degree programme. If you are unsure which you should be using, please contact your module team.

Click here for Harvard referencing guidelines

Academic integrity and misconduct policy

Click here to view Arden University's policy on academic integrity and misconduct

Statement on use of artificial intelligence on assessment

Click here to view Arden University's statement on the use of artificial intelligence on assessment

Support information

Click here to view guidance on how to apply for short-term extensions

Click here to view guidance on how to apply for extenuating circumstances

Please click here for link to academic skills team support