BIRMINGHAM CITY University

Coursework Assignment Brief
Assessment 1 - Undergraduate

Academic Year 2025-26 S1

Module Title: Artificial Intelligence and Machine Learning	
Module Code: CMP5367	

Assessment Type **Deliverable1 (D1):** **Coursework: Report**	Level 5	Weighting 80%	**Word Count** **D1.a** Machine Learning Experiment Portfolio **(60%)** **D1.b** Final Report **(40%)**: 1500-2,000 words (excluding references)
Submission Date D1.a Experiment Portfolio Nov 10th D1.b Report &code Dec 8th	**Submission Time** 3:00 pm	**Module Leader** Hadeel Saadany	

Assessment Brief:

Assessment Information	
Assessment Summary	**D1: Coursework Assessment (80% of total module mark):** There are **two submissions** for this assessment, each contributing to the final report mark: **D1.a**: **Experiment Portfolio** – write-up, insights, and annotated code **(60%)** **D1.b: Final Report & complete codebase (40%)** Includes final report (1500–2000 words) and well-documented, reproducible codebase. **See details of each deliverable below.**
Assessment Title	Artificial Intelligence using Machine Learning Models
Things to include:	See description of the task further below in this document.

Completion of this assessment will address the following learning outcomes:	
1	Compare the different aspects involved in the modern Artificial Intelligence, Machine Learning and Data Science.
2	Critically evaluate and practice a range of Machine Learning algorithms, Data Science tools, and frameworks for developing AI solutions.
3	Apply the learned algorithms, tools and frameworks to solve real life problems.
4	Demonstrate skills in formulating research problems and writing technical reports.

Submission Information

Present any written aspects of the assessment using font size 11 and using 1.5 spacing to allow for comments and annotations to be added by the markers. This assessment will be marked anonymously and should show your student number only. Submit this coursework assessment task via Moodle.

Late Submission

Assessments must be submitted in the format specified in the assessment task, by the deadline and to the submission point published on Moodle. Failure to submit by the published deadline will result in penalties which are set out in Section 6 of the Academic Regulations, available at: https://icity.bcu.ac.uk/Quality-Enhancement-and-Inclusion/Quality-Assurance-and-Enhancement/Academic-Regulations

Word Count

The maximum word count for this module assessment is shown on Page 1. A +10% margin of tolerance is applied, beyond which nothing further will be marked. Marks cannot be awarded for any learning outcomes addressed outside the word count.

The word count refers to everything in the main body of the text (including headings, tables, citations, quotes, lists etc.). Everything before (i.e. abstract, acknowledgements, contents, executive summaries etc.) and after (i.e. references, bibliographies, appendices etc) is **not** included in the word count limit.

Referencing Style

- BCU Harvard

More information on referencing is available here: https://www.bcu.ac.uk/library/services-and-support/referencing

Use of Artificial Intelligence

Whilst AI tools can be helpful in assisting learning, when it comes to assessment, the Academic Misconduct Procedure is clear that this should be a student's own original work and not the work of other people or AI tools. The Use of AI Tools – Student Guidelines document follows the same guidelines your lecturers use. If you are unsure of whether AI is appropriate within your work, please read the guidelines or ask your lecturer. For advice and guidance around academic writing, please visit the Centre for Academic Success.

Academic Integrity Guidance

Academic integrity is the attitude of approaching your academic work honestly, by completing and submitting your own original work, attributing and acknowledging your sources when necessary. Understanding good academic practice in written and oral work is a key element of academic integrity. It is a positive aspect of joining an academic community, showing familiarity with and acknowledging sources of evidence. The skills you require at higher education may differ from those learned elsewhere such as school or college.

You will be required to follow specific academic conventions which include acknowledging the work of others through appropriate referencing and citation as explicitly as possible. If you include ideas or quotations that have not been appropriately acknowledged, this may be seen as plagiarism which is a form of academic misconduct. If you require support around referencing, please contact the Centre for Academic Success

It is important to recognise that seeking out learning around academic integrity will help reduce the risk of misconduct in your work. Skills such as paraphrasing, referencing and citation are integral to acting with integrity and you can develop and advance these key academic skills through the Centre for Academic Success (CAS).

To learn more about academic integrity and its importance at university, you can access CAS resources on Moodle. Furthermore, you can book on to workshops and request 1-2-1 support around key academic skills.

Academic Misconduct

Academic misconduct is conduct that has or may have the effect of providing you with an unfair advantage by relying on dishonest means to gain advantage and which therefore compromises your academic integrity.

The Academic Misconduct procedure sets out the process we will follow, and the penalties we may apply, in cases where we believe you may have compromised your academic integrity by committing academic misconduct. The Academic Misconduct Procedure and information about academic support is available at: https://icity.bcu.ac.uk/Student-Affairs/Appeals-and-Resolutions/Academic-Misconduct-Procedure

BIRMINGHAM CITY UNIVERSITY
FACULTY OF COMPUTING, ENGINEERING AND THE BUILT
ENVIRONMENT
COURSEWORK ASSIGNMENT BRIEF
CMP5367 – Artificial Intelligence and Machine Learning

BIRMINGHAM CITY
University

Title: Artificial Intelligence using Machine Learning Models .

Style: Coursework consisting of a report, dataset, and programming scripts / notebooks. There are <mark>two submissions</mark> for this deliverable, each contributing to the final report.

Rationale: This coursework is most suited for assessing the learning outcomes of the module providing the practical nature of the AI field. The area is growing fast and the interest in machine learning solutions constantly increases. Learning to formulate and solving practical and research-oriented data-driven projects will ensure your continuing employability through development of analytical soft skills.

Description:
You are required to:
- work on a publicly available dataset, formulate a **classification** or **regression** model to address a real-life problem (e.g., predict whether a person is eligible for a loan/credit card). You are expected to identify an appropriate set of algorithms that can be used to attempt to solve the classification or regression task.

- build and evaluate a machine learning model that would address the problem, and draw conclusions and recommendations based on your findings. There are <mark>two components</mark> to this deliverable, each deliverable builds towards the final report. See detailed description below. Your work should be original and produced by you. Copying whole tutorials, scripts from other sources is not allowed. Any material you borrow from other sources to build on should be clearly referenced (use comments to reference in Python scripts); otherwise, it will be treated as plagiarism, which may lead to investigation and subsequent action.

D1: Portfolio & Report (80% of total mark)
There are <mark>Two components</mark> to this deliverable each deliverable builds towards the final report. The following sections explain each component focus and its expected deliverables.

D1.a: Machine Learning Experiment Portfolio (60%)

Timing: Mid-module (Week 3-9)
Focus: Technical development and documentation of the ML workflow
Includes:
1. **Dataset Exploration & Research Questions (10% of D1 Mark)**
   - Students work on an open-source dataset (from sources like Kaggle, UCI, etc.).
   - Formulate 2–3 meaningful research questions or hypotheses on the dataset.
   - Justify dataset choice (relevance, size, features, etc.).
   - Discuss potential challenges (missing data, imbalance, etc.).
2. **Exploratory Data Analysis (EDA) (20% of D1 Mark)**
   - Data cleaning (handling missing values, outliers)
   - Feature understanding (distributions, correlations, etc.)
   - Visualizations (histograms, box plots, pair plots, etc.)
   - Feature engineering (if applicable)

3. **Predictive Modelling & Evaluation (30% of D1 Mark)**
   - Model selection (e.g., decision trees, SVM, logistic regression, etc.)
   - Training and testing split.
   - Performance metrics (accuracy, precision, recall, F1-score, ROC-AUC).
   - Hyperparameter tuning and cross-validation.
   - Discussion of model strengths and limitations.

Deliverables:
   - Annotated Jupyter notebook(s) or Python script for items 1,2, and 3.
   - Short technical summary (2–3 pages) explaining key decisions and findings.
   - Optional: GitHub repo or ZIP file submission for reproducibility

D1.b Final Report & Code Submission Group Work (40% of D1 Mark)

Timing: End of module (**Deadline December 8th**)
Focus: Integration, reflection, and communication of findings
   - Implement steps 1,2 and 3 on an open-source dataset.
   - Summarise the key results of the experiment, emphasising the effectiveness of your models and any significant findings.
   - Reflect on challenges, limitations and ethical considerations.
   - Include final cleaned and commented code of the experiment.

Grading Split:
   - Code quality and reproducibility (25%).
   - Written report (15%)

Deliverables:
   - Final report (structured like a research paper: introduction, methods, results, discussion, references). **Check report template on Moodle**.
   - Complete codebase (GitHub repo or ZIP file)

Note on References

   - Include a comprehensive list of all references cited in your report.
   - Follow a consistent citation style as per your academic guidelines.
   - Include references to any coding tutorial that have been used in the experiments.

Note on Dataset:

Before using any open-source dataset, ensure you review its licensing terms and publishing rights to confirm that it permits academic use, redistribution, and modification—respecting data ownership and ethical guidelines is essential in responsible AI research.

Submission Details:

Format: Upload assessments to Moodle within the relevant upload points

Regulations:

- The minimum pass mark for a module is 40%
- Re-sit marks are capped at 40%

Late Penalties
If you submit an assessment late at the first attempt, then you will be subject to one of the following penalties:

- if the submission is made **between 1 and 24 hours** after the published deadline the original mark awarded will be reduced by **5%**. For example, a mark of 60% will be reduced by 3% so that the mark that the student will receive is 57%.
- if the submission is made between **24 hours** and **one week (5 working days)** after the published deadline the original mark awarded will be reduced by 10%. For example, a mark of 60% will be reduced by 6% so that the mark the student will receive is 54%.

==if the submission is made after 5 days following the deadline, your work will be deemed as a fail and returned to you unmarked.==

The reduction in the mark will not be applied in the following two cases:

o the mark is below the pass mark for the assessment. In this case the mark achieved by the student will stand

o where a deduction will reduce the mark from a pass to a fail. In this case the mark awarded will be the threshold (i.e., 40%)
Please note:
If you submit a re-assessment late then it will be deemed as a fail and returned to you unmarked.
Feedback:

Marks and Feedback on your work will normally be provided within 20 working days of its submission deadline.

D1 [Individual]: Report -- Table of Marking Criteria (80%)

Criterion	0-20% Fail	20-39% Fail	40-49%	50-59%	60-69%	70-79%	80-100%
Dataset(s) & Question(s) (10% of overall assessment 1 mark)	Inappropriate dataset or lack of its initial analysis and understanding; ill-formulated questions.	Dataset selected but poorly justified. Questions vague or irrelevant.	Satisfactory dataset and questions, but significant errors in initial dataset analysis or not fully justified questions.	Satisfactory dataset and justified questions, but some minor errors in initial analysis.	Good choice of dataset and questions with fair impact and no errors in initial analysis.	Very good choice of dataset and questions with strong impact, no errors in initial analysis.	Excellent choice of dataset and questions with major impact, no errors in initial analysis. Research-level questions.
Exploratory Data Analysis (20% of overall assessment 1 mark)	Missing or inappropriate data visualisation and exploration.	Incomplete or insignificant EDA analysis and result interpretation	Basic EDA with limited insights. Few visualizations or conclusions on the output.	EDA covers key aspects. Some insights and visualizations with limited comments and/or analytical inspection of the output.	Good data analysis employing different preprocessing and visualisation techniques with detailed comments on output.	Strong EDA, error free, using diverse techniques for data preprocessing and visualisations. The analysis provides valid comments on the analysis and visualisation and analytical insights on the output.	Excellent EDA, error free using advanced data preprocessing and visualizations techniques with detailed explanations, including thorough insights into data distribution, relationships between variables, and identification of any patterns or anomalies.
Predicative Modelling and Evaluation (30% of overall assessment 1 mark)	Missing or inappropriate model building and evaluation.	inappropriate model building and evaluation.	Basic model with minimal evaluation. Metrics mentioned but not interpreted.	Model implemented with basic evaluation. Metrics interpreted and limited analysis of the results.	Good model building with good insightful evaluation with a detailed analysis of the evaluation.	Strong choice of model building and evaluation. Analytical comments show an understanding of the evaluation metrics.	Excellent model building with advanced techniques employed and strong evaluation. The analytical evaluation shows advanced knowledge of the metrics and their interpretation.
Code (25% of overall assessment 1 mark)	Missing or not compiling/ executing.	Compiling and executing but implementing only some deliverables.	All deliverables are implemented, but there are some major errors, and/or lack of comments.	All deliverables are implemented, but there are some minor errors, and/or insufficient/ inaccurate comments.	All deliverables are implemented with no errors, but code is not optimised and/or with insufficient comments.	All deliverables are implemented in efficient way, following s/w principles, with clear and accurate comments, and no errors.	All deliverables are implemented in efficient way, following s/w principles, employing some advanced methods, with clear and accurate comments, and no errors.
Report (15% of overall assessment 1 mark)	Not appropriately structured with main sections missing.	Badly planned and/or some sections and/or referencing to code missing.	All required sections are covered, but structure is not well planned or major details missing.	Well planned with all required sections present, but some details or code referencing missing or not clearly explained.	Well planned and clearly formulated with all required sections present, but with some minor details missing.	Very well planned and clearly presented, with appropriate and sufficient referencing to code and literature.	Excellent, complete, clearly presented professional work, with appropriate and sufficient referencing to code and literature.