SCHOOL OF ARCHITECTURE, COMPUTING, & ENGINEERING

Submission instructions

- Cover sheet to be attached to the front of the assignment when submitted
- All pages to be numbered sequentially
- All work has to be presented in a ready to submit state upon arrival at the ACE Helpdesk. Assignment cover sheets or stationery will **NOT** be provided by Helpdesk staff

Module code	**CN6005**
Module title	**Artificial Intelligence**
Module leader	**Dr Nadeem Qazi**
Assignment tutor	**Dr Nabeela / Dr Nadeem Qazi**
Assignment title	**AI coursework**
Assignment number	
Weighting	**50%**
Handout date	**31/10/2023**
Submission date	**17/12/2023**
Learning outcomes assessed by this assignment (see course handbook)	**Learning Outcomes: 1 – 9**
Turnitin submission requirement	**yes**
Additional information	• ASSESSMENT FEEDBACK - Feedback on your assessment will be available in four working weeks from the submission date. Please refer to the module pages on UEL+ for assessment specific details.

Form of assessment:

☐ Individual work ☒ Group work

For **group work** assessment which requires members to submit both individual and group work aspects for the assignment, the work should be submitted as:

☒ Consolidated single document ☐ Separately by each member

Number of assignment copies required:

☒ 1 ☐ 2 ☐ Other

Assignment to be presented in the following format:

☒ On-line submission
☐ Stapled once in the top left-hand corner
☐ Glue bound
☐ Spiral bound
☐ Placed in a A4 ring bound folder (not lever arch)

Note: To students submitting work on A3/A2 boards, work has to be contained in suitable protective case to ensure any damage to work is avoided.

Soft copy:

☐ CD (to be attached to the work in an envelope or purpose made wallet adhered to the rear)
☐ USB (to be attached to the work in an envelope or purpose made wallet adhered to the rear)
☒ Soft copy not required

Note to all students

Assignment cover sheets can be downloaded from UEL Plus via the following pathway.

Home Page → ACE Information → ACE Helpdesk → Assignment Front Sheets

All work has to be presented in a ready to submit state upon arrival at the ACE Helpdesk. Assignment cover sheets or stationery (including staplers) will NOT be provided by Helpdesk staff. This will mean students will not be able to staple cover sheets at the Helpdesk.

You must be Working in the Group of 4 students Stickly No Indidiviual Work.You will be provided a Peer Review Assessment Form to evualate the working participation of the each member of the group. Your final project marks will be calculated based on the peer review Assessment Form.

Chose any dataset from the following and perform the following Tasks : You may also use any other publicly available dataset for classification.

- o **Wisconsin Breast cancer data**
  https://archive.ics.uci.edu/ml/datasets/breast+cancer+wisconsin+(original)
- o **Teaching Assistant Evaluation data**
  https://archive.ics.uci.edu/ml/datasets/Teaching+Assistant+Evaluation
- o **Ecoli Data**
  https://archive.ics.uci.edu/ml/datasets/Ecoli
- o **Car Evaluation**
  https://archive.ics.uci.edu/ml/datasets/car+evaluation
- o **Haberman's Survival Dataset**
  https://archive.ics.uci.edu/ml/datasets/Haberman's+Survival
- o **Website Phishing**
  https://archive.ics.uci.edu/ml/datasets/Website+Phishing

1. Apply an Explortary Data Analysis on your chosen data using python highlighting descriptive analysis of your chosen data , explaining all the columns of your chosen including the label column , from here define the nature of the problem i.e. is it a classification or clustering problem and how many classes are in the data set. Highlight all the Python code necessary for this task in your report.   **5**

2. **Compare the Accuracy of Parmeteric model with NON Parameteric Model by performing following (30 Marks)**

   2.1 Apply a non parameteric model such as KNN or Decision Tree using python for the classification , you should be able to define the training , testing and validation test , mention the pre-processing steps required for your data set . Find the accuracy of the clasess using Confusin matric and Accuracey curve etc.   **10**

   2.2 Appy a parameteric model such ANN using Python Jupyter Notebook to classify using one of the following data set. , mention the pre-processing steps required for your data set. Use 4-fold cross validation for training, testing and validating the neural network. Describe how you built the artificial neural network in Python Notebook such as How many neurons/layers are in the network? Why? How did you configure the initial weights Compare the

Accuracy of the ANN model with the accuracy of non paramertric model as found in the above task 3.0 **10**

2.3 Develeop a Convolutation Neural network Model and compare its accuracy with ANN. Highlight which of the models performed best among all the models you used. **10**

3 **Write a research report which should include the following sections: 15**
- **Abstract Lieterature review**
- **Description of the dataset (as you performed in Task 1)**
- **Outline of both the design and implementation of the artificial neural network showing number of layers hidden units etc.**
- **Discussion of the training, testing and validation process you followed**
- **Results comparison and explanation of the all the models .** Accuracy curve,confusion Matrix,precision recall. Include an accuracy curve figure for the training, testing and validation results. The x-axis will represent the number of epochs and the y-axis will represent the percentage accuracy
- **Conclusion What were the main challenges?**
- **What would you do if you had more time?**
- **100 words from each member on their contributions and comments**

You must demonstrate substantial contributions beyond the scope of the lectures.

Your final report must comprise all the task i.e. Task1 ,2,and 3 as mentioned aboveof the following components:

See next page for the format of the research paper.

AUTHOR GUIDELINES FOR PROCEEDINGS MANUSCRIPTS IN 16 POINT TIMES NEW ROMAN, FULLY CAPITALISED AND CENTRED AND ONE BLANK LINE AFTER THE TITLE

Author(s) Name(s) in 14 point times New Roman & Centred
Author Affiliation(s), Italic in 12 point times New Roman & Centred
E-mail Italic in 12 point times New Roman, Centred and give one blank line before starting the abstract

Abstract: Type abstract in, 11 point times New Roman, single-spaced type with zero spacing before and after and the word abstract in bold.
All manuscripts must be in English.
All text after Abstract must be in a two-column format.
Give two blank lines before starting introduction

1. Formatting your page:

Top & Bottom Margins: 2.5cm
Left & Right Margins: 2.5cm
All text after Abstract must be in a two-column format, single spaced in 12 point times New Roman.
Please do not place any additional blank lines between paragraphs.
Columns are to be 7.6 cm wide, with a 0.8cm space between them. Text must be fully justified.

2. First-order headings:

For example, "**1. Introduction**", should be 14 Times New Roman boldface, initially capitalised, flush left, with one blank line before, and one blank line after. Use a period (".") after the heading number, not a colon.

2.1. Second-order headings:

As in this heading, they should be 12 Point Times New Roman boldface, initially capitalised, flush left, with one blank line before, and one after.

2.1.1. Third-order headings. Third-order headings, as in this paragraph, are discouraged. However, if you must use them, use 12 Points Times New Roman boldface, boldface, initially capitalised, flush left, preceded by one blank line, followed by a period and your text on the same line.

3. Page numbering and Footnotes:

Do not exceed eight pages; including graphs, illustrations, references etc.
No page numbering and Do not use any footnotes.

4. Illustrations, Figures, photographs and tables:

All should have captions below and centred 11 Points Times New Roman within TWO columns at the top or bottom of the page with NO Bold face or Italics

5. References:

List all bibliographical references alphabetically in 12 point Times New Roman, single-spaced and one blank line after each reference at the end of your paper. When referenced in the text, enclose the citation like for example, (Smith, 2004).

Smith S., Smith A., Roberts A., "Article Title", *Journal*, Publisher, Location, Date, pp. 1-10.
Smith S., Smith A., Roberts A, *Book Title*, Publisher, Location, Date.

Turnitin Policy

1. We recognise the educational desirability that all of our students should enjoy the opportunity to self-submit their work to Turnitin (before submitting for assessment). We also recognise that Turnitin Originality Reports will sometimes assist in the identification of plagiarised work submitted for assessment.

    2. We will make Turnitin available to all of our students by way of our virtual learning environment (UELPlus) and we will encourage them to use it to improve their referencing skills.

    3. All students will be given the opportunity to make multiple submissions of their written work to Turnitin.

    4. All students will be advised, at the point of enrolment, that their work will be made available to third parties (such as Turnitin) for specified purposes, by way of a clause to be added to the Student Contract (the proposed clause, as suggested by Turnitin UK and JISCPAS, is set out in Annex I) and will be referred to Turnitin's Questions and Answers for Students *.

A Module Leader may decide, in accordance with the policy of the appropriate School, that all student submissions for a particular component of assessment