University of Lincoln
School of Computer Science
Assessment Briefing 2023-2024
CMP9139 Assessment Item 1

The use of AI tools to generate all or part of your assessment submission is **not** permitted unless specifically mentioned below.

Module Code & Title: CMP9139 Research Methods
Contribution to Final Module Mark: 100%
Important Information on Dishonesty, Plagiarism and AI Tools: University of Lincoln Regulations define plagiarism as 'the passing off of another person's thoughts, ideas, writings or images as one's own...Examples of plagiarism include the unacknowledged use of another person's material whether in original or summary form. Plagiarism also includes the copying of another student's work'. Plagiarism is a serious offence and is treated by the University as a form of academic dishonesty. Please note, if you use AI tools in the production of assessment work **where it is not permitted**, then it will be classed as an academic offence and treated by the University as a form of academic dishonesty. Students are directed to the University Regulations for details of the procedures and penalties involved. For further information, see www.plagiarism.org
Description of Assessment Task and Purpose: This assignment is concerned with research data gathering, analysis and interpretation – you will obtain a dataset, investigate quantitative methods for analysing this data using inferential statistics, design an appropriate methodology, conduct your own data analysis using appropriate software, reflect upon the results, and present your findings. The assessment involves writing a 4-page report in the format of a scientific article, and creating a 5-minute video presentation on the same topic. Your first task is to acquire a non-trivial research dataset. We suggest that you take a pre-existing dataset from another source, which should be acknowledged in your report, which you should describe and then focus on the analysis of this data. There are a wide range of sources that could be used. You must ensure that the dataset that you choose is suitable legally (e.g. does not violate GDPR, you have permission to freely use the dataset, etc) and ethically (e.g. data has been collected with the consent of participants, it does not use sensitive/personal information, etc). A few indicative examples of possible datasets could include (but are not limited to):

- “fantasy football” player performance statistics,
- anonymised multi-user virtual reality data,
- classification performance versus ground-truth for a computer-vision recognition system,
- anonymised human performance/usability data when interacting with competing computer systems (e.g. existing vs updated interfaces),
- etc (further sources have been discussed in the lectures for example).

Alternatively, you may generate your own dataset. This task might involve the design of a methodology for collecting data as a primary part of the research – for example, by constructing a survey to elicit data from a chosen user group, or by collecting data from a simulated system under differing conditions, etc.

The choice of dataset can be oriented towards your own personal interests, such as data relating to your Research Project, etc., but you must submit only original work which has not been submitted for any other assignment, or which is not intended to be used for another assignment (e.g. for your Research Project). If in doubt, please discuss the choice of dataset with a member of the module delivery team at the earliest available opportunity. Whether you use an existing dataset or generate your own, your first task is to provide a description of this dataset, also making use of appropriate descriptive statistics.

The next task is to investigate the existing research methods and background literature for acquiring and analysing similar datasets. Please note that the focus of this task should be more than the domain-specific methods used for solving a particular research problem (e.g. if a research paper describes the development of an artificial neural network system for stock market prediction, we are most interested in the methods used to evaluate the system performance in predicting stock market trends, not the details of the neural network model itself). There is no need to develop any artefact to generate the dataset that you subsequently analyse. Please note also that the literature review should focus on literature relating to your own research question, not “textbook” literature on research methods in general.

Based on the background research, design and implement an appropriate methodology for analysing your chosen dataset. You will need to identify an appropriate research question (or questions) and/or hypothesis to test. For example (but are not limited to):

- evaluating the effect of the full moon on behaviour,
- deciding whether hospital carpeting results in more infections,
- selecting the best means to stop smoking,
- testing whether acetaminophen or ibuprofen helps faster with headaches
- etc.

Please note: you must apply inferential statistics and/or Bayesian statistics to draw conclusions about the population under consideration from the sample data, for example, by applying techniques introduced in the module such as confidence intervals or statistical tests (t-Test, ANOVA, Spearman Correlation, etc). Your analysis must be non-trivial – for example, just applying descriptive statistics such as mean and standard deviation would not be sufficient. Descriptive statistics should however be used, as appropriate, to justify the choice of techniques. If you are in doubt, please discuss the choice of methodology with a member of the module delivery team at the earliest available opportunity.

Take care to justify the choice of research techniques in your report, including discussion of the alternatives considered. You should make sure to explain and describe the techniques applied with sufficient clarity to allow other researchers to replicate your findings if desired. Please make sure to describe the approach and software that you used to carry out statistical testing. Consider how to best present your results, e.g. using tables, graphs, etc. Discuss the results obtained and the conclusions inferred with respect to the original research hypothesis or question. Finally, reflect on the value of quantitative approaches in respect to your study. How does this differ from qualitative approaches, and how could the latter be valuable?

There are two required elements for submission to this Assessment:

1. Submission of a report (maximum 4 pages in length using the assigned template, including figures and references), in the style of a scientific paper. Instructions and guidance for this appears below.
2. Submission of a presentation video. This involves submission of a video file (with a maximum length of 5 (five) minutes), a Panopto video, or a link to an unlisted YouTube video. Instructions and guidance for this appears below.

In addition to these required elements, there are two optional elements that may be submitted if you choose to do so. These should be included in the .zip file submitted to the supporting documentation upload area, as described in the Submission Instructions below.

- Appendix to the 4-page report: if you choose to submit this, it should be a single .pdf file (your choice of presentation format, no template is specified). This appendix may contain, for example, extended characterisation/analysis details, code, etc. Note: the 4-page report must be able to stand alone, with no need to refer to the appendix. Therefore the appendix is an optional submission component.
- Presentation slides to support your video presentation: if you make use of presentation slides to support your presentation video, then you may submit them as part of the supporting documentation .zip file. If you choose to do so, submit the presentation slides in either .pptx or .pdf format. Since the use of presentation slides in your presentation video is not required, this is an optional submission component.

In summary, there are two submission components that are required for this assignment. Furthermore, there are two submission components that are optional, which are in addition to the required components. The CRG describes how full marks can be achieved by submitting only the required components. The submission of the optional elements (particularly the Appendix) may assist in providing further evidence to support a higher grade, but should not be relied on to fulfil the essential requirements of the assignment that are outlined in the paragraphs above.

This is an individual assessment. While you are encouraged to discuss your approaches and results with your course colleagues, all work and reporting thereon (i.e. the report/presentation to be submitted) must be your own work.

Learning Outcomes Assessed:

On successful completion of this component a student will have demonstrated competence in the following areas:

[LO1] Identify an appropriate area for study contextualised by the award being studied.

[LO2] Critically evaluate, select and apply research methods in the specialist area of study.

[LO3] Demonstrate practical skills in the development of a research proposal and literature survey.

[LO4] Evaluate legal, social, ethical and professional issues in the area of study.

Please refer to the Assessment Item 1 CRG for further details.

Knowledge & Skills Assessed:

Subject Specific Knowledge, Skills and Understanding: Literature searching, Referencing, Numeracy, Project Planning, Techniques and Skills (statistics, data analytics), Subject-specific knowledge.

Professional Graduate Skills: Independence and personal responsibility, adaptability, verbal communication, written communication, creativity, critical thinking, IT skills, self-reflection and life-long learning, problem solving, effective time management, working under pressure to meet deadlines, leadership.

Emotional Intelligence: Self-awareness, self-management, motivation, resilience, self-confidence.

Career-focused Skills: Skills (see above) and attributes (see above) required by employers.

Assessment Submission Instructions:

The deadline for submission of this work is included in the SoCS Submission dates spreadsheet on Blackboard. There are two files to be submitted for this assessment:

1. Submission of your report must be made electronically through Blackboard to the *Assessment Item 1 upload area* for this module. It must be a single PDF file using the required template, with a maximum length of four pages (including figures/tables and references). A presentation penalty may be applied for reports that exceed this 4-page limit.

2. You must also submit your presentation video as either a single video file (contained in a .zip file), a Panopto video, or a plaintext file containing a link to an unlisted YouTube video (contained in a .zip file), in the *Supporting Documentation area for Assessment Item 1*. This .zip file must be named with your full name and student ID number. The video file must be contained within a compressed folder in .zip format: other file types will not be accepted. Be aware of possible file-size upload limits. Your video should show yourself speaking, but may be accompanied by appropriate graphics (presentation slides from MS PowerPoint, for example). A presentation penalty may be applied to video submissions that exceed 5-minutes in length. The two optional submission components, if you choose to submit them, should also be included in this .zip file.

DO NOT include this briefing document with your submission.

Date for Return of Feedback:

Please see the School assessment dates spreadsheet.

Format for Assessment:

Two items are required for submission: a report and a presentation.

Report:

Write a 4-page report using the IEEE conference paper format (see: https://www.ieee.org/conferences/publishing/templates.html where both LaTeX and Word templates may be obtained) with a maximum of 4 pages including figures and references. Additional pages are not permitted. The report should be written in your own words and follow the general format of a scientific paper, with all sources appropriately referenced. The report should have the following sections (*with a suggested length for each – this is only guidance, not a requirement*):

- Title
- Abstract
- Introduction (*approx. ½ page*), including motivation for the topic, choice/description of dataset, legal/ethical appropriateness, and research hypothesis or question(s).
- Related Work, comprising a literature survey of existing research methods considered for data acquisition and analysis with respect to the chosen dataset (*less than 1 page*).
- Methodology (*less than 1 page*), including a thorough description of the research techniques applied in practice.
- Results (*less than 1 page*).
- Conclusion (*approx. ½ page*), including further discussion of the results and your conclusions with respect to the original research hypothesis or question.
- References

Your written work for this part of the assessment must be submitted via Blackboard (PDF format), to the *Assessment Item 1 submission area*, according to the Submission Instructions above.

Presentation video:

You are required to create a video of you presenting your work, maximum 5-minutes long, covering the work included in your report. It should show you speaking, and may be accompanied by supporting visual aids (e.g. presentation slides, images, etc). The presentation should briefly justify & motivate your dataset choice and research question(s), justify the analysis method you have employed, and discuss the outcome of your analysis (roughly mirroring the structure of the report). For this part of the assessment you must submit your presentation video in one of three ways: a video file (contained within a .zip file), a Panopto video, or a link (contained within a plain-text file which is added to a .zip file) to an unlisted YouTube video. The .zip file should be submitted to the *Supporting Documentation for Assessment Item 1* upload area, according to the Submission Instructions above. If you choose to submit either/both of the *optional* submission components, these should also be included in this .zip file.

Assessment Support Information:

Students are encouraged to use any lecture/workshop notes and their own personal notes to assist them with the completion of the assessment. Also, students are allowed to use any library and/or online resource as a guide on how to solve the assessment problems. Any additional resources should be appropriately acknowledged if used.

Feedback Format:

Feedback will be provided on Blackboard based on fulfilled criteria outlined in the associated CRG. Further feedback may also be provided to students who request clarifications.