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| University of Central Lancashire logo  **School of Psychology and Computer Science** | UCLan Coursework Assessment Brief | | | Academic Year 2022/23 |
| Module Title: Data Science Module Code: CO3722 | | | Level 6 |
| **Research Report: Emerging Technologies** | This assessment is worth 50% of the overall module mark | | |
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| **THE BRIEF/INSTRUCTIONS** **Context** Businesses and organisations need to continually develop their systems and technologies in order to be able to meet the challenges of the modern globalised world. Their challenge, however, is to be able to make rational decisions about which technologies they should incorporate in their businesses. Academia and other places of research continually invest in new Artificial Intelligence (AI) concepts, including data science and analytics.  One of the key sources for identifying emerging IT products is the annual Gartner Hype curves for a range of application areas, see <https://www.gartner.com/technology/research/methodologies/hype-cycle.jsp> **The Task** You will choose an area of business and a specific Use Case in which data science is exploited (or has the potential) to bring competitive advantage.  You will critically discuss the application of data science, including the:   * acquisition of specific data sources, * data processing, * algorithm selection, * data visualisation and, * data analysis and methods for interpretation of results.   Critically evaluate the case for or against adoption (or current/developing application) of data science for your chosen business and specific Use Case.  This preliminary activity of research and design will better prepare you for assignment 2 in which you will have the background and design tools to carry out your own investigations and data science project. **Deliverables** The **Research Report** assignment will be presented in 4 sections: **Introduction** This section will introduce your project, your business, specific Use Case and potential source of a dataset for analysis. **Critical Discussion of the Application/Developing Expertise of Data Science** This section will relate specifically to your business and Use Case and their approach or potential application for the use of data science. This will cover the challenge of acquiring or using specific data sources for your Use Case, approaches to data processing, description of proposed machine learning algorithms and their design, opportunities for data visualisation and the methods for analysing/interpreting the data required to gain business competitive advantage. **Critical Evaluation of the case for or against uptake of such Technology** You will evaluate the benefits or otherwise, including the challenges of applying machine learning algorithms, maintenance and ethical considerations of a data science model for business insight. **Conclusions and Recommendations** This concluding section will succinctly and persuasively present your conclusions and recommendations. A reference list should follow this chapter.  Note: no coding is required for this assignment however, you may wish to carry out some preliminary data analysis/visualisations to inspect any data and to inform your planning. **Formatting Requirements** You are recommended to use appropriate chapter headings and sub-headings to provide the structure to your report.  Please submit the assignment as a single Word document in the Blackboard Assignment Submission link for the module.  Please note that all assignments will be checked for plagiarism using computer software (Turnitin) as part of the submission process.  **Learning Outcomes for Assessment:** 1, 3 & 4   1. **Perform and evaluate basic descriptive, exploratory and confirmatory data analysis** 2. Write programs in an appropriate language for analysing data 3. **Visualise data in multiple ways** 4. **Summarise, organise and communicate knowledge from data analysis**   **To achieve 40% +**   * you will provide no critical analysis of the use of data science to provide competitive advantage. * There will be description of emerging tools to support data science and of the business/Use Case but detail will be lacking. * Challenges of such technologies are limited/or lacking in description.   **To achieve 50% +**   * you will provide little critical analysis of the use of data science to provide competitive advantage. * There will be largely descriptive content of emerging tools to support data science and of the business/Use Case. * Challenges of such technologies will be highlighted.   **To achieve 60% +**   * you will provide some critical analysis of the use of data science to provide competitive advantage although this could be strengthened through additional literature and examples. * Reference will be made to your dataset with some description of its content and proposed model design. * There will be some discussion of emerging tools to support data science and a description of the business/Use Case. * Challenges of such technologies will also be discussed with some reference to literature.   **To achieve 70% +**   * you will provide critical analysis of the use of data science to provide competitive advantage. * There will be discussion of emerging tools to support data science and a description of the business/Use Case. * Justification will be provided demonstrated by discussion of your chosen dataset and proposed model design. * Challenges of such technologies, including ethical considerations will also be extensively discussed with reference to literature.  **Assessment Criteria for Research Report Assignment**  |  |  |  |  | | --- | --- | --- | --- | | **Criteria** | **Choice of Business and Use Case**  **Overall presentation of work** | **Critical discussion of the application/developing expertise of Data Science** | **Critical evaluation of the case for or against uptake of such technology.** **Conclusions and recommendations** | | Weighting | (20%) | (40%) | (40%) | | 1st (70-100%)  Outstanding - Excellent | **Critically and comprehensively evaluates and justifies** choices of Technology and Business Use Case.  There is a **clear and logical** structure to the analysis and justification.  **Outstanding/excellent** layout and presentation and use of references. | **Critically and comprehensively evaluates and justifies** the purpose and theoretical capabilities of the chosen Data Science Technologies.  There is a **clear and logical** structure to the analysis and justification.  **Outstanding/Excellent level** of knowledge and understanding of the topic. | **Critically and comprehensively evaluates and justifies** the Data Science Technologies.  There is a **clear and logical** structure to the analysis and justification of use of such technologies.  **Outstanding/Excellent level** of understanding of the topic.  Clear and conclusive findings. | | 2:1(60-69%)  Very Good | **Critically evaluates and justifies** choices of Technology and Business Use Case.  There is mostly throughout a **clear** structure to the analysis and justification.  Overall, very good presentation and use of references with minor errors. | **Critically evaluates and justifies** the purpose and theoretical capabilities of the chosen Data Science Technologies.  There is generally a **clear and logical** structure to the analysis and justification.  Very good level of knowledge and understanding of the topic. | **Critically evaluates and justifies** the Data Science Technologies.  There is an overall **clear and logical** structure to the analysis and justification.  Some clear and conclusive findings. | | 2:2 (50-59%)  Good | **Critically evaluates and justifies** choices of Technology and Business Use Case.  There is **some** structure to the analysis and justification.  Good presentation and use of references with some errors. | **Critically evaluates and justifies** the purpose and theoretical capabilities of the chosen Data Science Technologies.  There is **some** structure to the analysis and justification. | **Discusses and justifies** the Data Science Technologies.  There is **some** structure to the analysis and justification.  Good conclusions and some recommendations. | | 3rd (40-49%)  Satisfactory | **Justifies** choices of Technology and Business Use Case.  Fair presentation and use of references with errors throughout. | **Justifies** the purpose and theoretical capabilities of the chosen Data Science Technologies. | **Justifies** the use of some Data Science Technologies.    There is some structure and justification with conclusions and few recommendations. | | Fail (<40%)  Unsatisfactory | **Identifies** choices of Technology and Business Use Case.  Very little use of literature and referencing. | **Identifies** the purpose and theoretical capabilities of the chosen Data Science Technologies. | **Identifies** a basic understanding of Data Science Technologies.    **Few** conclusions and recommendations.  Descriptive and lacks structure. |   **PREPARATION FOR THE ASSESSMENT**  Formative assessment will take place each week following release of the assignment. This will not, however contribute to your final mark and is meant as a teaching and learning exercise.  Preparation and development for this assignment will take place during semester one within seminars, tutorials and weekly formative assessment. | | | | |
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| **RELEASE DATE AND HAND IN DEADLINE**  Assessment Release date: **26th** **September 2022**  Assessment Deadline Date and time: **12th December 2023, 23:55**.  Please note that this is the final time you can submit – not the time to submit!  Your feedback/feed forward and mark for this assessment will be provided on **13th January 2023.** | | | | |
| **SUBMISSION DETAILS**  The Research Report assignment must not exceed 2000 words. Five marks will be deducted if the word count is exceeded. Please ensure you include a word count at the end of your assignment. Images, diagrams, and pseudo code maybe used to inform your understanding of your potential algorithm design and use of data science tools. Such content can be included in your appendices section at the end of the document but must be referenced throughout when discussed. No programming is required for this assignment. Your appendices do not contribute to your word count.  Submission of one word processed document is required through Blackboard using Turnitin. University referencing style should be used throughout. | | | | |
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| **HELP AND SUPPORT**   * You will find information links to all our Library resources in the Library area of the Student Hub. For support with using these resources, please contact your subject librarian at [SubjectLibrarians@uclan.ac.uk](mailto:SubjectLibrarians@uclan.ac.uk). * You can get support with your academic skills (academic writing, critical thinking and referencing) through WISER. For details of the WISER support services go to the [Study Skills section of the Student Hub.](https://msuclanac.sharepoint.com/sites/StudentHub/SitePages/Study.aspx) * If you have not yet made the university aware of any disability, specific learning difficulty, long-term health or mental health condition, please complete a [Disclosure Form](https://forms.office.com/Pages/ResponsePage.aspx?id=gpn262sDxEyyAnrrGUxQZf4Gb8AdfcJGv3uVCD0jKDBUQVpUMkY3VUhHQlROSFEwSDRTWk40NVBYWS4u). The [Inclusive Support team](https://msuclanac.sharepoint.com/sites/StudentHub/SitePages/Inclusive-Support.aspx) will then contact to discuss reasonable adjustments and support relating to any disability.  For more information, visit the [Inclusive Support page of the Student Hub.](https://msuclanac.sharepoint.com/sites/StudentHub/SitePages/Inclusive-Support.aspx) * To access mental health and wellbeing support, please complete our [online referral form](https://msuclanac.sharepoint.com/sites/StudentHub/SitePages/Counselling,-mental-health-and-wellbeing.aspx). Alternatively, you can email [wellbeing@uclan.ac.uk](mailto:wellbeing@uclan.ac.uk), call 01772 893020, attend a drop-in, or visit our [UCLan Wellbeing Service](https://msuclanac.sharepoint.com/sites/StudentHub/SitePages/Counselling,-mental-health-and-wellbeing.aspx) pages for more information. * If you have any other query or require further support you can contact Student Support via [studentsupport@uclan.ac.uk](mailto:studentsupport@uclan.ac.uk).  Speak with us for advice on accessing all the University services as well as the Library services. Whatever your query, our expert staff will be able to help and support you. For more information please visit the Student Hub. * If you have any valid mitigating circumstances that mean you cannot meet an assessment submission deadline and you wish to request an extension, you will need to apply online prior to the deadline. | | | | |
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| Disclaimer: The information provided in this assessment brief is correct at time of publication. In the unlikely event that any changes are deemed necessary, they will be communicated clearly via e-mail and a new version of this assessment brief will be circulated. | | | Version: 1 | |