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| This question paper consists  of 6 printed pages, each is identified by the Code Number LUBS5309M |  |  |
| **© UNIVERSITY OF LEEDS**  C:\Users\bmsjeh\AppData\Local\Packages\Microsoft.Windows.Photos_8wekyb3d8bbwe\TempState\ShareServiceTempFolder\amber icon.jpeg  **(Semester 2, 2024/2025)**  **Assessed Coursework**  **LUBS5309M Forecasting and Advanced Business Analytics**  **100% Assignment** | | |

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| The assignment consists of two equally weighted tasks. You are required to submit your work as a single business report with two sections (one section for each task) in either Microsoft Word (.docx) or PDF format, describing the work you have done. Additionally, you **must** submit the code used in your analysis **in the dedicated folder**, in .R file format. The report must be written in a language and format suitable for the intended audience—the management team of the companies—ensuring they can easily understand the business insights or predictions provided, as well as the reasoning behind them.  **Part 1:**  **Background Information for Part 1:** You are a data analyst working for a start-up that provides data-driven insights for businesses. The company specializes in predicting economic trends, and your current project involves forecasting future US personal consumption expenditures (PCE) based on historical data.  Your task is to evaluate different approaches for forecasting this key economic indicator. You will assess the performance of multiple suitable forecasting techniques, including an appropriate simple forecasting method, exponential smoothing, and an ARIMA model. No additional models are required. Your goal is to identify and describe the best model for predicting future trends in personal consumption expenditures.  **Business Question:** The client needs a reliable model to predict PCE for the upcoming year. Your goal is to identify which forecasting method provides the most accurate predictions and make an estimation for PCE values for the year ahead (next 12 months). This forecast will inform the client’s business strategy for the year ahead.  **Data Provided:** You are given seasonally adjusted historical data on personal consumption expenditures (PCE), expressed in billions of dollars, available in the **PCE.csv** file. In your report for this task, you should clearly describe the steps and decisions made during your analysis process. Additionally, you should present the models' predictions alongside the real values in a clear and interpretable format and provide an estimation of the PCE values of the best model for the next 12 months.  **Part 2:**  **Background Information for Part 2:** You are tasked with analysing customer reviews for hotels collected by Hotel Insight, a company dedicated to improving customer satisfaction in the hospitality industry. The reviews, which are rated on a Likert scale from 1 (low satisfaction) to 5 (high satisfaction), can offer valuable insights into factors influencing customer experience.  Your task is to analyse the reviews, and your goal is to identify the key factors discussed that affect customer satisfaction. This analysis will help the company better understand the elements that contribute to customer satisfaction and dissatisfaction.  **Business Question**: Hotel Insight seeks to gain actionable insights into the factors that affect customer satisfaction/dissatisfaction. Your goal is to identify the main factors discussed in both positive and negative reviews and provide a detailed interpretation of these factors.  **Data Provided:** You are provided with the **HotelData.csv** file, containing customer reviews and satisfaction ratings. Your analysis will involve preprocessing the text and applying an appropriate method to extract key themes from the reviews. In the section of your report covering this task, you should present your findings in a clear and accessible manner to guide business decisions aimed at improving customer experience.  For the text analysis and due to computational demands, you should take a random sample of 2,000 reviews. To do this, use the sample\_n() function from the dplyr package in R. To ensure reproducibility, use the set.seed(XXX) function before applying sample\_n(), where XXX should be the last three digits of your student ID. For example, if your student ID is 2019XX123, your code might look like this:  **set.seed(123)**  **test<-sample\_n(reviews, 2000)**  **Marking Criteria:** You should present your findings using tables, figures, and text as appropriate. The report should be suitable for communicating with the management team. Your report should justify why your approach is the optimal and logical solution.  The submission will be judged per the following marking criteria in line with the [Postgraduate Level 5: LUBS Generic Assessment Criteria (FHEQ 7)](https://students.business.leeds.ac.uk/wp-content/uploads/sites/4/2018/11/PG-Level-5-Marking-Criteria.pdf).   |  |  |  | | --- | --- | --- | | **Success Criteria** | **Description** | **Weighting** | | Overall Presentation | The report should be structured and formatted appropriately for the intended audience, with effective use of tables and visuals. The language should be clear and suitable for the communication it aims to achieve. | 20% | | Business Understanding & Conclusion | The report must demonstrate a clear understanding of the business question and its requirements. It should also provide a well-articulated answer to the initial business question, offering a clear response that addresses the key issue. | 20% | | Data Understanding and preparation | The report must enable the audience to understand the data and support them in answering the business question. It should include an appropriate use of visuals and statistics. The submission must demonstrate that data preparation, including transformation and handling of missing data, has been properly conducted to ensure the answer to the business question is valid. Additionally, it should provide sufficient details about any interpretations, assumptions, and data transformations made, allowing the audience to understand and verify the conclusions drawn. | 20% | | Modelling selection, execution and evaluation | The submission must demonstrate that a model has been thoroughly evaluated and that the recommendation aligns with the set requirements. It should showcase the robustness of the methodology, ensuring that any assumptions made have been critically assessed. Additionally, the submission code must be reproducible, allowing others to verify the analysis and results. | 40% |   **GENERATIVE AI – GUIDELINE**  This assignment is categorised **AMBER for the use of GenAI: generative artificial Intelligence (GenAI) may only be used in an assistive role, as specifically articulated**below. In the rest of this work, you must not use GenAI.  This assignment requires you to independently write the content for all sections. **You are NOT permitted to use GenAI assistance in the writing process.** Since this task is designed to assess your understanding of the module's learning outcomes, it is crucial to showcase your own skills. You will be required to confirm that the submission is entirely in your own words.  You **MAY use GenAI (if you wish) as a tool for enhancing your understanding** of the literature, the business problem, and the overall context. **Additionally, you MAY use GenAI to better understand functions in programming languages for data analytics**, but you are still expected to write your own code. Remember, GenAI should serve as a learning aid, not a replacement for your own work.  **Please note that you may NOT use GenAI tools to create content or write code directly for you, including analytical code.** The core analytical work—such as data preprocessing, model building, and result interpretation—must be entirely your own. Additionally, remember that you are responsible for the final submission; AI tools can be prone to errors and biases, so always review and verify anything you’ve used GenAI for.  Finally, please note that these instructions are particular to this assignment. Other assignments will have different instructions for which parts you may and may not use GenAI. Not all Amber assignments will be the same. |

**Assignments should be a maximum of 3500 words in length.**

All coursework assignments that contribute to the assessment of a module are subject to a word limit, as specified on the assessment brief. **The word limit is an extremely important aspect of good academic practice, and must be adhered to.** Unless stated otherwise in the relevant module handbook (if one has been provided), the word count includes EVERYTHING (i.e. all text in the main body of the assignment including summaries, subtitles, contents pages, tables, supportive material whether in footnotes or in-text references) except the main title, reference list and/or bibliography and any appendices. It is not acceptable to present matters of substance, which should be included in the main body of the text, in the appendices (“appendix abuse”). It is not acceptable to attempt to hide words in graphs and diagrams; only text which is strictly necessary should be included in graphs and diagrams.

You are required to adhere to the word limit specified and state an accurate word count on the cover page of your assignment brief. Your declared word count must be accurate, and should not mislead. Making a fraudulent statement concerning the work submitted for assessment could be considered academic malpractice and investigated as such. If the amount of work submitted is higher than that specified by the word limit or that declared on your word count, this may be reflected in the mark awarded and noted through individual feedback given to you.

**The deadline date for this assignment is 12:00:00 noon on Tuesday 6th May 2023**

An electronic copy of the assignment must be submitted to the Assignment Submission area within the module resource on the Blackboard MINERVA website no later than 12:00:00 noon prompt on the deadline date.

Faxed, emailed or hard copies of the assignment will not be accepted.

Failure to meet this initial deadline will result in a reduction of marks, details of which can be found at the following place:

<https://students.business.leeds.ac.uk/assessment/code-of-practice-on-assessment/>

**SUBMISSION**

Please ensure that you leave sufficient time to complete the online submission process, as upload times can vary. Accessing the submission link before the deadline does **NOT** constitute completion of submission.You **MUST** click the ‘**CONFIRM**’ button before 12:00:00 noon for your assignment to be classed as submitted on time, if not you will need to submit to the Late Area and your assignment will be marked as late. It is your responsibility to ensure you upload the correct file to the MINERVA, and that it has uploaded successfully.

**It is important that any file submitted follows the conventions stated below**:

**MITIGATING CIRCUMSTANCES**

If you are affected by circumstances that will have a short-term impact on your ability to complete coursework assessments (for example a minor illness), you can make an application for an extension to a coursework deadline. Please note, all extension requests must be made prior to the original assessment deadline. To read more about this process please click here - [https://students.business.leeds.ac.uk/student-support/mitigating-circumstances-extensions-and-additional-consideration/](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fstudents.business.leeds.ac.uk%2Fstudent-support%2Fmitigating-circumstances-extensions-and-additional-consideration%2F&data=05%7C01%7CM.F.Lambert%40leeds.ac.uk%7C923a9c103a2a456f8bb508db44cc7f28%7Cbdeaeda8c81d45ce863e5232a535b7cb%7C1%7C0%7C638179417312676267%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=hAC1lXJg3Dtvm8lgLIVOdyPNZDJqF6%2FEwhl8tF%2Fz%2B1g%3D&reserved=0)

**FILE NAME**

The name of the file that you upload must be your student ID only.

**ASSIGNMENT TITLE**

During the submission process the system will ask you to enter the title of your submission. This should also be your student ID only.

**FRONT COVER**

The first page of your assignment should always be the Assessed Coursework Coversheet (individual), which is available to download from the following location:

<https://students.business.leeds.ac.uk/forms-guidance-and-coversheets/>

**STUDENT NAME**

You should **NOT** include your name anywhere on your assignment

**END**