**BTEC Assignment Brief**

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| **Qualification** | Pearson BTEC Higher Nationals in Digital Technologies |
| **Unit number and title** | Unit 5: Big Data & Visualisation |
| **Learning aim(s)** | **LO1** Examine big data and visualization for decision-making  **LO2** Investigate statistical and graphical techniques, tools, and industry software solutions for big data and visualization  **LO3** Demonstrate the use of industry software to manipulate data and prepare visual presentations for a given data set  **LO4** Assess the role, responsibilities and challenges of data specialists. |
| **Assignment title** | Evaluate Operational Efficiency |
| **Assessor** | Behzod Qurbonov |
| **Issue date** |  |
| **Hand in deadline** |  |
| **Scenario or Context** | **Scenario:**  **You have been hired as a junior data analyst at a vehicle sales company.**  The company plans to improve operational efficiency in its offices by leveraging existing big data and advanced visualization techniques. In this project, you will be required to develop a series of practical results and decisions based on the following theoretical approaches, data analysis, and visualization:   * Fundamental concepts of big data. Data collection, cleaning and their strategic role. The importance of targeted visualization, stages, design principles and benefits of data-driven decision-making * Select and apply statistical and graphical methods using industry-leading tools and software solutions for data analysis and visualization. * Manipulate data and conduct targeted analysis processes * Prepare visual presentations using industry software. * Roles in a data-driven industry, their respective responsibilities and strategies for ensuring data compliance.   Formatting criteria:  Follow the Harvard referencing style.  Font family: Times New Roman or Calibri  Font color: Black ONLY  Font size: 12  Font header size: 14  Word limit: minimum 3,000 words |
| **TASK** | The first requirement of this project is to provide preliminary documentation where you have to satisfy:   1. Explain the fundamental concepts of big data. 2. Investigate the value of data for decision making to both end users and organizations. 3. Analyze the advantages and challenges of data-driven decision making to an organization. 4. Evaluate the potential impact of data on both users and organizations when using data for decision making. 5. Describe statistical and graphical techniques for big data and visualization used in industry. 6. Review different industry-leading tools and software solutions available for analyzing and visualizing data. 7. Compare how different industry-leading tools and software solutions are used to analyze and visualize data, with examples 8. Evaluate own data preparation and manipulation, justifying your choice of statistical techniques, to show how this meets the needs of stakeholders for a given data set. 9. Laboratory work Demonstration (provided by a tutor): 10. Select an industry-leading tool and software solution to manipulate data for a given data set. 11. Demonstrate the use of queries to summarize and group data for a given data set. 12. Prepare a visual presentation to summarize data for a given data set. 13. Explain the different roles, responsibilities, and challenges faced by data specialists. 14. Review the different strategies used by data specialists to ensure data compliance. 15. Analyze the role, responsibilities, and challenges faced by data specialists when building ethics into a data-driven culture. |
| **Sources of information to support you with this Assignment** | *Dietel, P. (2020) Intro to Python for Computer Science and Data Science: Learning to Program with AI, Big Data and The Cloud. London: Pearson.*  *Franks, B. (2020) 97 Things About Ethics Everyone in Data Science Should Know. USA: O’Reilly Media.*  *Graesser, L. and Keng, W. L. (2020) Foundations of Deep Reinforcement Learning: Theory and Practice in Python. London: Addison-Wesley Professional.*  *Kirk, A. (2019) Data Visualisation: A Handbook for Data Driven Design. London: Sage Publications.*  *Knaflic, C. N. (2015) Storytelling with Data: A Data Visualization Guide for Business Professionals. USA: John Wiley & Sons.*  *Loukides, M., Mason, H. and Patil, D. J. (2018) Ethics in Health Data Science. USA: O’Reilly Media.*  *Marr, B. (2017) Data Strategy: How to Profit from a World of Big Data, Analytics and the Internet of Things. London: Kogan Page.*  *McCormick, K. and Salcedo, J. (2017) SPSS Statistics for Data Analysis and Visualization. USA: John Wiley & Sons.*  *Freeman, M., Ross, J. (2019) Data Science Foundations Tools and Techniques: Core Skills for Quantitative Analysis with R and Git. London: Addison-Wesley Professional.*  *Viescas, J. L. (2018) SQL Queries for Mere Mortals: A Hands-On Guide to Data Manipulation in SQL. 4th Edition. London: Addison-Wesley Professional.*  *Wilke, C. O. (2019) Fundamentals of Data Visualization: A Primer on Making Informative and Compelling Figures. USA: O’Reilly Media.* |

**Learning Outcomes and Assessment Criteria**

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| **Pass** | **Merit** | **Distinction** |
| **LO1** Examine big data and visualization for decision making | | **D1** Evaluate the potential impact of data on both users and organizations when using data for decision making. |
| **P1** Explain the fundamental concepts of big data.  **P2** Investigate the value of data for decision making to both end users and organizations. | **M1** Analyze the advantages and challenges of data-driven decision making to an organization. |
| **LO2** Investigate statistical and graphical techniques, tools and industry software solutions for big data and visualization | | **LO2 and LO3**  **D2** Evaluate own data preparation and manipulation, justifying your choice of statistical techniques, to show how this meets the needs of stakeholders for a given data set. |
| **P3** Describe statistical and graphical techniques for big data and visualization used in industry.  **P4** Review different industry-leading tools and software solutions available for analyzing and visualizing data. | **M2** Compare how different industry-leading tools and software solutions are used to analyze and visualize data, with examples. |
| **LO3** Demonstrate the use of industry software to manipulate data and prepare visual presentations for a given data set | |
| **P5** Select an industry- leading tool and software solution to manipulate data for a given data set.  **P6** Demonstrate the use of queries to summarize and group data for a given data set. | **M3** Prepare a visual presentation to summarize data for a given data set. |
| **LO4** Assess the role, responsibilities and challenges for data specialists | | **D3** Analyze the role, responsibilities and challenges faced by data specialists when building ethics into a data-driven culture. |
| **P7** Explain the different roles, responsibilities and challenges faced by data specialists. | **M4** Review the different strategies used by data specialists to ensure data compliance. |