**Database System & Security Assignment Brief**

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| **Module Details** | | | |
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| **Module code:** | LDS7002M | **Level of Study:** | 7 |
| **Module Leader(s):** | Lakmali Karunarathne | **Credits:** | 20 |
| **Assessment format:** | Portfolio – Database case study with accompanying written report | **Method of submission:** | Turnitin within Moodle- insert link |
| **Deadline or Assessment Period:** | 21st Jan 2025, 12Noon | **Feedback date and place:** | 12th Feb 2025, Turnitin within moodle submission |
| **Assessment limits:** length, load, word count, etc. | N/A | **Component number:** | 1 of 1 |
| **Is this exempt from anonymous marking under the policy?** | No | **Component weighting:** | 100% |

| **Assignment Description** |
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| **Assessment Task: Database Management System for a Restaurant Chain**  You have been hired by a growing restaurant chain to design and implement a new database system to manage their operations. The restaurant chain has multiple locations and offers a diverse menu that includes appetizers, main courses, desserts, and beverages. Each location serves a large number of customers daily.  The restaurant chain needs a system that can handle various aspects of their operations, including managing menu items, tracking customer reservations, and processing daily sales. They also want to monitor inventory levels for ingredients and receive alerts when stock levels are low.  **Develop a Database Management System (DBMS) for the restaurant chain that manages reservations, inventory, menu items, and sales. The system should also handle customer information and provide reporting capabilities.**  **Requirements:**   * The system should allow customers to make and manage reservations online. * The system should track inventory levels of ingredients and automatically update them as items are used. * The system should process daily sales, including generating daily revenue reports and itemized sales. * The system should store customer information such as name, contact details, and reservation history. * The system should store menu information including item names, descriptions, prices, and categories (e.g., appetizers, main courses, desserts, beverages). * The system should provide reporting capabilities such as sales reports by menu category, daily sales summaries, and inventory reports. * The system should be secure and protect sensitive data, including customer contact information and payment details.   **Deliverables:**   * A data model including an ER diagram to define the tables and relationships needed for the DBMS. * Normalization of the designed ERD up to 3NF. * A SQL script to create the tables and populate them with sample data. * Write and implement SQL queries to retrieve the following information:   1. Total sales for each menu category for a given date range.   2. Top 10 most popular menu items for a given date range, including item name, category, and total sales.   3. Customer reservation history, including name, contact details, and number of reservations made in the last month.   4. Current inventory levels for each ingredient, including ingredient name, category, and quantity in stock.   5. Revenue generated by each restaurant location in the last year, including location name and total revenue.   **Assume that the following information is available:**   * **Menu Information:** menu item ID, item name, item description, price, category ID. * **Category Information:** category ID, category name, category description. * **Customer Information:** customer ID, customer name, email, phone number. * **Reservation Data:** reservation ID, customer ID, restaurant location ID, reservation date, number of people. * **Sales Data:** transaction ID, customer ID, menu item ID, transaction date, quantity sold, total price. * **Inventory Data:** ingredient ID, ingredient name, quantity in stock, unit of measure.   **General Considerations:**   * Provide a solution by creating a database schema, ER diagram, normalization, and sample SQL queries to retrieve the requested information. * Each ERD, Normalization, tables, SQL queries (screenshots required in figure formats) should be fully described in your assessment. Support the implementation with written documentation. * Submit a report summarizing findings, including tables and charts to support the analysis. Include a brief discussion of any limitations or caveats to your design. * Provide proper in- text citations.   **Report should include supportive screenshots (should formatted into figures) along with well justify explanations for the provided screenshots.**  **Note:** Convert the assessment report and program code into a single PDF/DOCX file and other materials ((ERD in PNG.JPEG), SQL file and etc) should allocated into one folder and convert the folder into zip folder before submission. Make sure that **you should NOT zip the assessment report**. Assessment report and the Zip folder should submit to the given submission link before the submission date.  It is important that the content is underpinned with the inclusion of relevant academic theory, concepts, and models where appropriate, as well as contemporary industrial insights. These should be accurately cited and referenced according to [**York St John Harvard Referencing**](https://www.yorksj.ac.uk/students/referencing/)throughout. |

| **Learning Outcomes** |
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| You must successfully achieve the following Learning Outcomes to pass this assessment:  PLOs **7.2-7.5, 7.9**  **7.2** Develop abstract thinking and design ability to analytically demonstrate concepts relating to data science.  **7.3** Use research-based knowledge for the design of experiments, analysis, and interpretation of data to provide valid results.  **7.4** Critically evaluate and analyse advanced data science topics, and concepts, and implement them in workplace.  **7.5** Identify and implement appropriate programming and software tools to critically analyse big data applications in workplace.  **7.9** Critique legal, social, and ethical within the field of data science and Applicable ancillary sectors, as applied to contemporary research and industry practice. |

| **Advice and Guidance** |
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| If you require support with your academic skills, please visit: [**https://www.yorksj.ac.uk/london-campus/student-support/student-support-and-guidance/**](https://www.yorksj.ac.uk/london-campus/student-support/student-support-and-guidance/)  The work you present should be your own work, and not just copied from others.  You can quote from others, but you must say who the author is and use quotation marks or paraphrase.  If you do not do so, we will investigate your work for academic misconduct.  This is particularly likely if your Turnitin similarity score is above 25% and/or individual matches are above 6%.  Please refer to the York St John University [**Code of Practice for Assessment and Academic-Related Matters**](https://www.yorksj.ac.uk/policies-and-documents/code-of-practice-for-assessment/).  We ask that you pay particular attention to the [**Academic Integrity**](https://www.yorksj.ac.uk/students/policies-for-students/) and [**Academic Misconduct Policies**](https://www.yorksj.ac.uk/media/content-assets/registry/policies/code-of-practice-for-assessment/24.Academic-Misconduct-Policy-2023-24.pdf) within. Penalties will be applied where a student is found guilty of academic and/or ethical misconduct, including termination of your programme of study.  You are required to keep to the word limit set for an assessment and to note that you may be subject to penalty if you exceed that limit. You are required to provide an accurate word count on the cover sheet for each piece of work you submit in accordance with [**Section 32: Agreed Penalties Policy**](https://www.yorksj.ac.uk/media/content-assets/registry/policies/full-code-of-practice-for-assessment/Code-of-Practice-for-Assessment-2023-24-FINAL-V2.pdf)**.**  For late or non-submission of work by the published deadline or an approved extended deadline, a mark of 0NS will be recorded. Where a re-assessment opportunity exists, a student will normally be permitted only one attempt to be re-assessed for a capped mark in accordance with [**Section 45: Scheme B Reassessment Policy**](https://www.yorksj.ac.uk/media/content-assets/registry/policies/code-of-practice-for-assessment/45.Scheme-B-Reassessment-2023-24.pdf)**.**  An extension to the published deadline may be granted to an individual student if they meet the eligibility criteria of [**Section 18: Exceptional Circumstances Policy**](https://www.yorksj.ac.uk/media/content-assets/registry/policies/code-of-practice-for-assessment/18.Exceptional-Circumstances-Policy-2023-24-V2.pdf)  **Please see the assessment criteria below.** |

| **How is this assessment marked?** |
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| Your work will be marked according to the assessment instructions provided within this document and the selected Learning Outcomes’ (LOs) (see above).  Furthermore, this assessment is marked using the assessment marking criteria or a similar rubric that aligns with the University’s Generic Assessment Descriptors (see below).[[1]](#footnote-1) This is to ensure all assessment decisions are comparable regardless of the discipline or mode of assessment.  Please note that you **must** meet the required baseline standards (50 – 59%) which will include the LOs and minimum expectations of the assessment. Further still, you must ensure you meet the requirements of each grade boundary to progress to the next, i.e., you should demonstrate your learning through the standards of the Pass, Merit and Distinction to reach a Distinction (70 – 84%). These standards are designed to scaffold and build your learning to achieve your fullest potential in each criterion being assessed. |

| **Marking Criteria** |
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| **Pass Grade Bands (100 – 50)** (Learning Outcomes must be met)  **Fail Grade Bands (49 – 0)** (Learning Outcomes are not met)  *Assessors, please insert your own assessment marking criteria relevant this module which provides further detail and disciplinary specificity, etc. For more information on how to use the GAD to guide your assessment marking criteria visit* [*Marking Criteria.*](https://blog.yorksj.ac.uk/assessment/marking_criteria/) |

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| **Criteria** | **Deliverables** | **Marks** |
| 1. Research Skills | Learner should demonstrate good knowledge of Database Management System Techniques. Learners should provide a rationale for the choices they have made. | 5 |
| 2.Thinking skills & Creativity | Learner should identify the requirements for the DBMS. This includes understanding the business processes and data requirements for the system.  Based on the requirements, design the database schema and normalization. This includes defining the tables, columns, relationships between the tables and Normalization up to 3NF. | 30 |
| 3. Practical and Professional Learning skills | Learners should be able to demonstrate technical ability to create the database using the chosen database management system, such as MySQL or PostgreSQL and populate the database with sample data to test the system. | 30 |
| Learner should be able to apply SQL queries to retrieve the requested information and also test the system to ensure that it meets the requirements and works correctly | 20 |
| Deploy the system to the production environment to compliance with security standards and best practices. Learner should document the system, design and technical aspects. | 10 |
| 4. **Professional Conventions** | Citations are provided in Harvard’s style and the report is well organized and presented. Producing a clear and concise written report that summarizes the analysis and findings.  Presenting the results in a visually appealing and informative way. | 5 |

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| **Criteria** | **Pass**  **(50 – 59)** | **Merit**  **(60 – 69)** | **Distinction (70 – 84)** | **Distinction (85 – 100)** | **Borderline Fail (45 - 49)** | **Fail**  **(30 - 44)** | **Fail**  **(0 - 29)** | **Marks** |
| 1. Research Skills | Basic understanding of DBMS techniques with a simple rationale for choices. | Good understanding of DBMS techniques with a clear and logical rationale. | Comprehensive understanding of DBMS techniques with well-reasoned rationale for all choices. | Outstanding insight into DBMS techniques with strong, insightful rationale. | Limited understanding of DBMS techniques with weak rationale. | Poor understanding of DBMS techniques with flawed rationale. | No understanding of DBMS techniques or rationale provided. | 5 Marks |
| 2. Thinking Skills & Creativity | Basic identification of requirements; schema design with minimal normalization. potentially only to 1NF, with some relationships between entities correctly defined, though may lack sophistication. Limited consideration of data integrity and consistency issues. | Good identification of requirements; schema design with normalization to 2NF, with relationships clearly established between most entities. Shows awareness of potential data integrity issues and takes steps to address them. | Thorough requirements identification: schema design normalized to 3NF, ensuring data redundancy is minimized, with well-defined relationships and constraints. Clear thought process in designing schema that anticipates future data needs or changes. | Exceptional identification of requirements; schema fully normalized to 3NF with advanced optimization, and data security. Innovative approaches to schema design that consider advanced data management strategies, such as partitioning, denormalization (where appropriate), or the use of specialized database features. | Incomplete or superficial identification of requirements with major gaps or omissions. Schema design is partially normalized but lacks coherence, with many relationships and constraints improperly defined or missing. Shows little consideration of data integrity or consistency. | Poor identification of requirements, missing key elements or making significant errors in understanding the task. Weak and poorly normalized schema design, likely stuck at 1NF with major flaws in relationships and constraints. Minimal consideration of data integrity, leading to potential inconsistencies or errors. | No identification of requirements. No functional schema design, or design that fails to meet even basic normalization and relational database principles. Total lack of consideration for data integrity, consistency, or any relevant database principles. | 30 Marks |
| 3. Practical & Professional Learning Skills | Able to create a functional database that meets the minimum requirements of the task, with basic sample data that demonstrates core functionalities. Simple SQL queries are used effectively to retrieve data, though they may lack complexity or fail to address all required scenarios. Limited or basic testing of the database, with some issues potentially overlooked. | Good technical ability is demonstrated by creating a well-structured database populated with relevant data, covering most use cases. SQL queries are well-constructed and effective, retrieving data for a variety of scenarios, with some use of more advanced features like joins, subqueries, or aggregate functions. Database is tested adequately, with a clear effort to ensure reliability and performance, though some minor issues may persist. | Strong technical skills are evident in the creation of a well-populated and thoroughly tested database, which is both functional and efficient. SQL queries are advanced and cover complex scenarios, including the use of nested queries, transactions, views, and stored procedures. Demonstrates a clear understanding of database optimization, with thoughtful indexing, query performance tuning, and the inclusion of security measures. | Exceptional technical skills are displayed in the creation of a highly optimized, secure, and fully functional database, exceeding the basic requirements. SQL queries are not only advanced but also innovative, efficiently handling complex data retrieval scenarios with a focus on performance and accuracy. Extensive testing of the database is conducted, covering edge cases, stress tests, and ensuring security, scalability, and maintainability of the system. | Limited technical ability is shown in the creation of a database that may be incomplete or lacks necessary features and data. SQL queries may be overly simplistic, poorly constructed, or fail to retrieve the correct data, with significant flaws or omissions. Minimal or ineffective testing, with major functionality or performance issues unaddressed. | Poor technical ability demonstrated by a database that is non-functional or seriously flawed, with significant missing components or errors. SQL queries are ineffective, incorrect, or fail to meet the basic requirements of the task. Little to no testing conducted, with major issues left unresolved, leading to a non-viable database solution. | No technical ability demonstrated, with no database created or a database that is completely non-functional and irrelevant to the task. No SQL queries provided, or those that are provided do not function or meet any criteria. No testing or consideration of database functionality, performance, or security. | 60 Marks |
| 4. Professional Conventions | Basic report with some structure; Harvard citations are used but with errors. | Well-structured report; Harvard citations mostly accurate; some visual appeal in presentation. | Professionally structured report; accurate Harvard citations; results presented clearly and attractively. | Exceptionally well-organized and clear report; perfect Harvard citations; highly informative and visually appealing presentation. | Report lacks clear structure; Harvard citations poorly applied. | Report is poorly organized; citations are incorrect or missing. | No report or citations provided; presentation is confusing or absent. | 5 Marks |

1. A rubric is a type of scoring guide that markers use to set out specific components and expectations for an assignment for their students. It is then used to guide the marking they undertake.  [↑](#footnote-ref-1)