BERLIN SCHOOL OF BUSINESS & INNOVATION

University for the Creative Arts

DEGREE: MSc Data Analytics

Module: Enterprise Data Warehouses and Database Management Systems

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Assignment Title: Database System Design for a Banking System

Assignment Type: Set exercise testing practical Skills.

Word Limit: 3000 words (+/- 300)

Weighting: 100%

Issue Date: 13/07/2023

Submission Date: 11/10/2023

Feedback Date: 25/10/2023

Plagiarism:

When submitting work for assessment, students should be aware of the InterActive/Canvas guidance and regulations in concerning plagiarism. All submissions should be your own, original work. Please note that you must not submit the same assignment for two different modules within your course.

You must submit an electronic copy of your work. Your submission will be electronically checked.

Learner declaration
I certify that the work submitted for this assignment is my own and research sources are fully acknowledged. **Student signature:** **Date:**

Harvard Referencing:

The Harvard Referencing System must be used. The Wikipedia, UKEssays.com or similar websites must **not** be used or referenced in your work.

Introduction

Learning Outcomes:

LO1. Learn the concepts of database and database management systems along with the concepts and approaches of database design, administration and management.

LO2. Learn the principals and science behind querying the data from a database management system to use for business analytics and implement the queries to retrieve the data from MySQL.

LO3. Write advanced SQL queries to manipulate, wrangle and derive insights from large database systems.

Assessment Criteria: Weighting 100%

3000 words

Tasks (All tasks are equally weighted):

Task 1. Design a database system for a bank. This bank can have several branches. In addition, any branch can have many clients. Also, any client can have, maximum, 10 accounts. Moreover, the clients can transfer money to their own accounts as well as to any other account (in this bank). You need to describe all the entities and attributes. In addition, by providing your own supportive reasons, you are requested to choose the proper DBMS (Relational or Non-Relational). (This task is related to **LO1** and **LO2**).

Task 2. Draw an ER Diagram for your database. Describe all possible schemas. Also, define all the tables (including attributes) and specify the types and length using SQL commands (your tables need to be filled by some meaningful data). Write, at least, eight SQL queries and explain the output of the queries*. Note that these eight queries must be complementary for/to each other in the form that they collectively shape a report. This means that they should not be structurally the same (with the same purpose). (This task is related to **LO2** and **LO3**).

TASK 3. Describe and analyse CAP theorem as well as the important factors that affect the efficiency of your database (e.g., Transactions, Consistency, Scalability). (This task is related to **LO1**, **LO2** and **LO3**).

***** *Note that you need to implement the database design in a DBMS (e.g., SQL Server, MySQL). You need to take the screenshot of it in order to prove that it is practical.*

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GUIDANCE ON ASSESSMENT

All materials must be properly referenced under Harvard conventions. The length required is 3000 words with tasks equally weighted. The writing style should be formal academic / report writing style with in-text referencing to support your comments and observations. Originality, quality of argument and good structure are required. The assignment should demonstrate sound understanding and ability to apply knowledge and theory of Enterprise Data Warehouse and Database Management Systems. Additional marks being awarded for juxtaposition and insight of issues.

Grading Criteria

	Generic Criteria	90 - 100	80 - 89	70 - 79	60 - 69	50 - 59	40 - 49	30 - 39	0 - 29
Level 7	**Knowledge of contexts, concepts, technologies and processes** The extent to which knowledge is demonstrated: *relevant contextual or theoretical issues are identified, defined and described* *historical or contemporary practices are identified, defined and described* *appropriate technologies, methods and processes are identified, defined and described*	Exceptional and remarkable critical understanding of current issues and historical contexts demonstrating knowledge at the forefront of the discipline Exceptional and highly original understanding of techniques methods and processes	Excellent and highly sophisticated critical understanding of current issues and historical contexts demonstrating knowledge at the forefront of the discipline An excellent and highly impressive understanding of techniques, materials and processes	Comprehensive critical understanding of current issues and historical contexts much of which is at, or informed by, the forefront of the discipline. Comprehensive knowledge of techniques and processes, and a critical understanding of their potential to advance scholarship in the discipline.	Significant understanding of current issues and historical contexts, much of which is at, or informed by, the forefront of the discipline. Significant knowledge of the techniques and processes applicable to understanding research and advanced scholarship in the discipline	Sound understanding of knowledge of current issues and historical contexts, some of which is at, or informed by, the forefront of the discipline. Sound knowledge of the techniques and processes applicable to research and advanced scholarship in the discipline	Passable understanding of knowledge of current issues and historical contexts, some of which is at, or informed by, the forefront of the discipline. Acceptable knowledge of the techniques and processes applicable to research and advanced scholarship in the discipline	Insufficient understanding of knowledge of the contextual, historical or theoretical issues that inform the discipline. Insufficient knowledge of techniques applicable to research and advanced scholarship in the discipline.	Very poor demonstration of understanding of contextual, historical or theoretical issues that inform the discipline. Very weak knowledge of technologies, methods and processes
	Understanding through application of knowledge The degree to which research methods are demonstrated: *relevant knowledge and information is compared, contrasted, manipulated, translated and interpreted* *knowledge and information is selected, analysed, synthesized and evaluated in order to generate creative ideas, solutions, arguments or hypotheses*	Exceptional and remarkable demonstration of research methods which generate highly developed critical insights into existing knowledge Exceptional and remarkable critical evaluation of existing knowledge leading directly to new hypotheses Exceptional and remarkable judgements made in relation to creative practice, current ideas, arguments and hypotheses	Excellent and highly sophisticated demonstration of research methods leading to impressive critical insights into existing knowledge Excellent and highly sophisticated critical evaluation of existing knowledge working towards new hypotheses Excellent and highly sophisticated judgements made in relation to creative practice, current ideas, arguments and hypotheses	Rigorous use of established methods of research combined with the ability to generate new concepts or insights into existing knowledge. Critical evaluation of current knowledge to evaluate methodological practices and propose new hypotheses. Carefully considered judgements on highly complex or 'under-researched' problems showing evidence of systematic analysis and deduction and creative processes to resolve them.	Confident use of established methods of research combined with the ability to recognise new concepts using existing knowledge. Critical evaluation of current knowledge to analyse methodological practices and propose hypotheses Informed judgements made on highly complex research problems showing evidence of systematic analysis and deduction and creative processes to resolve them	Sound use of established methods of research to develop and interpret existing knowledge. Critical evaluation of current knowledge and recognition of methodological practices. Sound judgements made on complex research problems showing evidence of systematic analysis and deduction and creative processes to resolve them.	Passable use of established methods of research to develop and interpret existing knowledge. Evidence of critical evaluation of current knowledge and recognition of methodological practices. Passable judgements made on complex research problems showing evidence of systematic analysis and deduction and creative	Insufficient use of existing methodologies to develop knowledge. Inability to fully understand or interpret relevant knowledge and methodological practices. Research problems are insufficiently complex and require mainly routine analytic and creative	Inability to use and interpret existing research methodologies Little or no ability to evaluate existing knowledge Inability to define a research problem and to generate solutions or hypotheses through research and practice

							processes to resolve them.	processes to resolve them.	
	Application of technical and professional skills The degree to which: *appropriate materials and media are selected, tested and utilised to realise and present ideas and solutions* *appropriate technologies, methods and processes are demonstrated* *transferable, professional skills are effectively demonstrated* *self management and independent learning are demonstrated*	Exceptional and remarkable critical and evaluative skills utilised leading to highly original solutions to very complex problems Outstanding application of advanced technical skills that fundamentally challenges current understanding and practices Exceptional and remarkable demonstration of professionalism, self-management and independent learning	Excellent and highly sophisticated critical and evaluative skills utilised leading to impressive solutions to very complex problems Highly impressive application of advanced technical skills that challenge current understanding and practices Excellent demonstration of professionalism, self-management and independent learning	Evidence of a high level of critical and evaluative skills in order to create original solutions to a range of highly complex problems. Application of advanced skills, techniques and processes that challenge knowledge and understanding of the discipline. Demonstration of a very high level of professionalism, self-management and independent learning	Evidence of the critical and evaluative skills necessary to construct solutions to a range of complex problems Application of advanced skills, techniques and processes that contribute to knowledge and understanding of the discipline. Demonstration of a competent level of professionalism, self-management and independent learning	Evidence of the critical and evaluative skills necessary to identify solutions to a range of complex problems. Application of advanced skills techniques and processes that sustain independent learning in the discipline. Clear demonstration of professionalism, self-management and independent learning	Evidence of the critical and evaluative skills necessary to identify solutions to a range of varied problems. Application of advanced skills techniques and processes that sustain independent learning in the discipline. Acceptable demonstration of professionalism, self-management and independent learning	Inability to demonstrate the critical and evaluative skills necessary to identify solutions to problems Insufficient ability to demonstrate the skills necessary for sustained independent learning Insufficient evidence of professional and transferable skills	Very poor ability to apply appropriate materials and media to present ideas and solutions Very poor judgement shown in choice of methods and processes Inability to manage self, meet deadlines, work professionally and independently