



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

LEVEL/ LEFEL 5

MODULE CODE/ COD Y MODIWL: ACCC5001
DATABASE MANAGEMENT SYSTEMS

ASSESSMENT TYPE/ MATH O ASESU: ASSIGNMENT

ASSESSMENT/COMPONENT/ ASESAD/CYDRAN: 2

COMPONENT WEIGHTING/ PWYSAU'R CYDRAN: 50 %

WORD COUNT/ NIFER Y GEIRIAU: 2000

SUBMISSION DETAILS/ MANYLION CYFLWYNO:

- **Make sure that Your Name , Your Student Number, Your Module Title, Assignment Title and Your Module Lecturer's Name are clearly shown on the front page of your assignment**
- **All assignments must be submitted electronically to Moodle and the report on Distributed Database has to be submitted through Turnitin.**



BACHELORS DEGREE ASSIGNMENT SPECIFICATION

Programme:	BSc Cloud Computing		
Assignment Component:	Assignment 2		
Assignment Title:	Database Management Systems		
Hand Out Date:	The Fourth week of term	Submission deadline:	Please refer to the assessments schedule published on Students' Hall in Moodle and the Assessment Board on campus

• Referencing:	In the main body of your submission you must give credit to authors on whose research your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have read or quoted in order to complete this assignment (e.g. for books: surname of author and initials, year of publication, <u>title of book</u> , edition, publisher: place of publication).
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Late submission will result in a late penalty mark, as follows:

Up to four weeks late, maximum mark of 40% for first attempts and 0% for resubmissions. (Academic Quality Handbook 2015/16 7.5 (5))

Learning Outcomes tested (from module/unit syllabus)	Assessment Criteria To achieve each outcome a student must demonstrate the ability to:
Apply well-established data analysis and design techniques to produce requirements and specifications for a database application showing a requisite understanding of the need for quality and data security.	• Create and document a database design for a given case study. • Create tables and views using SQL statements. • Retrieve the information from the database using appropriate SQL statements. • Demonstrate awareness on database security threats.

TASK DESCRIPTION

This is an individual ASSIGNMENT.

TASK 1

Security and Data Manipulation Triggers

Following the database for the To-Rent estate agent created in previous term, their renting service has grown rapidly and there is a high demand for their services. So, they are even planning to expand their business to different geographical regions in the UK. However, the management of the To-Rent suspects that there are fraudulent activities taking place within the renting and leasing services, with fake visits being recorded and fake leased property assigned to them. They suspect the following activities are taking place:

- Staffs are creating tables to hide property and client details through some activities made;
- Some leased property records are being deleted from the property table;

These activities need to be identified and stopped, and the person(s) responsible are needed to be identified. In your role as the Database Administrator you have been given the task of auditing *properties* and recording the activities for every **Create**, **Insert** and **Delete** operation carried out. You are to create a **Trigger** to automatically record the auditing data.

- (a) Create a Trigger that responds to **CREATE_Table**, **ALTER_Table** and **DROP_Table** commands on To-Rent estate agent database. The Trigger should store the following data:
- Database Name
 - Table Name
 - Event Type
 - Login Name
 - SQL Command
 - Audit Date & Time
- (b) Create a table named **PRGDatabaseAudit** to store the above details in question (a)
- (c) Create a table named *PRGPropertyAudit* to store the following data items:
- AuditID;
 - PropertyInformation (it should contain the ID of Client and leased property inserted, deleted or updated, client affected by the staff, staff responsible for the transaction and the date of transaction).
- (d) Create a Trigger that responds to **Insert** commands on Lease. The Trigger should store the following data:
- ID of Property inserted;
 - Date of insert;
 - Client inserted by the staff responsible;
- (e) Create a Trigger that responds to **Delete** commands on Lease. The Trigger should store the following data:
- ID of Property deleted;
 - Date of Delete;
 - Client deleted by the staff responsible;

(f) Create a Trigger that responds to **Update** commands on Lease. The Trigger should store the following data:

- Details of @Old and @New data;
- Date of update;
- Client updated by the staff responsible;

TASK 2

Report

The management of the *To-Rent estate agent* require a report showing mitigating approaches that you have put in place and how this functionalities work. You must present your security approach and outline why you have chosen them.

In the brief, you are required to submit a report detailing the problem and solutions provided. The report should be approximately 2000 words (excluding title page, table of contents, references and appendices).

In the report, document the strategies that can be employed by To-Rent estate agent to prevent further fraudulent activities.

Note:

- a) Include in the report a screenshot of sales and audit data table and how they can be used to detect any DDL and DML transaction occurring
- b) Identify the advantages to be gained from your proposed solution and use appropriate examples from your solution (in Task 1) to support your discussion. Show queries that can be ran using the database.

Note: Queries should be neatly presented in the report.

Also, in the report,

- a. Discuss the term Transaction and Concurrency as used in the DBMS.
- b. Explain the ACID properties of Transaction and why they are necessary? Which of the properties are responsible for user?
- c. Discuss the three anomalies such as Dirty Read, Unrepeatable Read and Lost Update caused by interleaved schedule with suitable example for each anomaly.
- d. Explain the two-phase locking and demonstrate how two-phase locking would help to avoid problem caused by Dirty Read using the Dirty Read schedule example mentioned in the above question (c).

Submission Details

You are required to complete the tasks outlined in the 'Task Description' section and to submit:

1. An electronic version of your Assignment Project via Turnitin.
2. Upload the zipped file for Task 1 containing your .sql files work to Moodle.

MARKING CRITERIA AND STUDENT FEEDBACK

This section details the assessment criteria. The *extent* to which these are demonstrated by you determines your mark. The marks available for each criterion are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Common Assessment Criteria Applied	marks available	
1. Research-informed Literature Marks will be awarded based on the quality of the research informed work documented in the Project Specification and Implementation Report.	20	
1. Knowledge and Understanding of Subject Marks will be allocated based on your ability to demonstrate your knowledge and understanding of the SQL data definition language as evidenced by your submission for Task 1.	30	
3. Analysis Marks awarded for Analysis will be based on your ability to analyse the case study problem scenario and implement appropriate solutions for the creation of the database and proposed distributed DBMS solution.	10	
4. Practical Application and Deployment Marks will be awarded based on your ability to build and deploy the database for Veterinary case study evidenced by your submission for Task 1, and for your queries and visualisation in Task 2 .	40	
5. Skills for Professional Practice Skills for Professional Practice will be assessed based on the written and presentational quality of the Project Specification and Implementation Report.	10	

Assignment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)	
	Up to four weeks late	
	First Attempt?	
		%

COMMON ASSESSMENT AND MARKING CRITERIA

	OUTRIGHT FAIL	UNSATISFACTORY	SATISFACTORY	GOOD	VERY GOOD	EXCELLENT	EXCEPTIONAL
Assessment Criteria	0-29%	30-39%*	40-49%	50-59%	60-69%	70-79%	80-100%
1. Research-informed Literature Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions	Little or no evidence of reading. Views and findings unsupported and non-authoritative. Referencing conventions largely ignored.	Poor evidence of reading and/or of reliance on inappropriate sources, and/or indiscriminate use of sources. Referencing conventions used inconsistently.	References to a limited range of mostly relevant sources. Some omissions and minor errors. Referencing conventions evident though not always applied consistently.	Inclusion of a range of research-informed literature, including sources retrieved independently. Referencing conventions mostly consistently applied.	Inclusion of a wide range of research-informed literature, including sources retrieved independently. Selection of relevant and credible sources. Very good use of referencing conventions, consistently applied.	A comprehensive range of research informed literature embedded in the work. Excellent selection of relevant and credible sources. High-level referencing skills, consistently applied.	Outstanding knowledge of research-informed literature embedded in the work. Outstanding selection of relevant and credible sources. High-level referencing skills consistently and professionally applied.
2. Knowledge and Understanding of Subject Extent of knowledge and understanding of concepts and underlying principles associated with the discipline.	Major gaps in knowledge and understanding of material at this level. Substantial inaccuracies.	Gaps in knowledge, with only superficial understanding. Some significant inaccuracies.	Evidence of basic knowledge and understanding of the relevant concepts and underlying principles.	Knowledge is accurate with a good understanding of the field of study.	Knowledge is extensive. Exhibits understanding of the breadth and depth of established views.	Excellent knowledge and understanding of the main concepts and key theories. Clear awareness of challenges to established views and the limitations of the knowledge base.	Highly detailed knowledge and understanding of the main theories/concepts, and a critical awareness of the ambiguities and limitations of knowledge.
3. Analysis Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence	Unsubstantiated generalisations, made without use of any credible evidence. Lack of logic, leading to unsupportable/missing conclusions. Lack of any attempt to analyse, synthesise or evaluate.	Some evidence of analytical intellectual skills, but for the most part descriptive. Ideas/findings sometimes illogical and contradictory. Generalised statements made with scant evidence. Conclusions lack relevance.	Evidence of some logical, analytical thinking and some attempts to synthesise, albeit with some weaknesses. Some evidence to support findings/views, but evidence not consistently interpreted. Some relevant conclusions and recommendations, where relevant	Evidence of some logical, analytical thinking and synthesis. Can analyse new and/or abstract data and situations without guidance. An emerging awareness of different stances and ability to use evidence to support the argument. Valid conclusions and recommendations, where relevant	Sound, logical, analytical thinking; synthesis and evaluation. Ability to devise and sustain persuasive arguments, and to review the reliability, validity & significance of evidence. Ability to communicate ideas and evidence accurately and convincingly. Sound, convincing conclusions / recommendations.	Thoroughly logical work, supported by evaluated evidence. High quality analysis, developed independently or through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Strong, persuasive, conclusions, justifiable recommendations.	Exceptional work; judiciously selected and evaluated evidence. Very high quality analysis, developed independently or through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Highly persuasive conclusions
4. Practical Application and Deployment Effective deployment of appropriate methods, materials, tools and techniques; extent of skill demonstrated in the application of concepts to a variety of processes and/or contexts; formulation of innovative and creative solutions to solve problems.	Limited or no use of methods, materials, tools and/or techniques. Little or no appreciation of the context of the application.	Rudimentary application of methods, materials, tools and/or techniques but without consideration and competence. Flawed appreciation of the context of the application.	An adequate awareness and mostly appropriate application of well established methods, materials, tools and/or techniques. Basic appreciation of the context of the application.	A good and appropriate application of standard methods, materials, tools and/or techniques. Good appreciation of the context of the application, with some use of examples, where relevant.	A very good application of a range of methods, materials, tools and/or techniques. Very good consideration of the context of the application, with perceptive use of examples, where relevant. Evidence of some innovation and creativity.	An advanced application of a range of methods, materials, tools and/or techniques. The context of the application is well considered, with extensive use of relevant examples. Application and deployment extend beyond established conventions. Innovation and creativity evident throughout.	Outstanding levels of application and deployment skills. Assimilation and development of cutting edge processes and techniques.
5. Skills for Professional Practice Demonstrates attributes expected in professional practice including: individual initiative and collaborative working; deployment of appropriate media to communicate (including written and oral); clarity and effectiveness in presentation and organisation.	Communication media is inappropriate or misapplied. Little or no evidence of autonomy in the completion of tasks. Work is poorly structured and/or largely incoherent.	Media is poorly designed and/or not suitable for the audience. Poor independent or collaborative initiative. Work lacks structure, organisation, and/or coherence	Can communicate in a suitable format but with some room for improvement. Can work as part of a team, but with limited involvement in group activities. Work lacks coherence in places and could be better structured.	Can communicate effectively in a suitable format, but may have minor errors. Can work effectively as part of a team, with clear contribution to group activities. Mostly coherent work and is in a suitable structure.	Can communicate well, confidently and consistently in a suitable format. Can work very well as part of a team, with very good contribution to group activities. Work is coherent and fluent and is well structured and organised.	Can communicate professionally and, confidently in a suitable format. Can work professionally within a team, showing leadership skills as appropriate, managing conflict and meeting obligations. Work is coherent, very fluent and is presented professionally.	Can communicate with an exceptionally high level of professionalism. Can work exceptionally well and professionally within a team, showing advanced leadership skills. Work is exceptionally coherent, very fluent and is presented professionally.