Ysgol Reolaeth Gogledd Cymru North Wales Management School

PRIFYSGOL GLYNDŴR WRECSAM WREXHAM GLYNDŴR UNIVERSITY

ASSIGNMENT BRIEF

Module title	Database Systems
Module code	CONL705
Module leader	Bindu Jose
Assessment title	Assignment 1
Launch date	*Week 1*
Submission deadline	Part 1 – Task 1 & Task 2: Monday Week 4 Part 2 – Task 3 & Task 4 – Monday Week 7
Expected date for return of marks and feedback	*What kind of feedback can students expect and when?* *Annotations, grademark and commnets*
Module outcomes assessed	1. Demonstrate an advanced understanding of the principles of the relational database model, data integrity and functional dependency. 2. Apply knowledge of database principles to identify and design appropriate solutions to logical data design problems. 3. Perform data manipulation and information retrieval operations using query language and stored procedure using commercially available DBMS software e.g. ORACLE SQL.
Assessment weighting	70%
Word count (if relevant)	
Assessment task details - provide a description of the task	

Help desk Scenario

A company with a large IT function is setting up an IT Helpdesk to handle hardware and software problems concerning the IT systems. Whenever anyone within the company has a problem they can contact the helpdesk. One of the

helpdesk operators will attempt to deal with the enquiry, but if an immediate answer cannot be given the problem is passed to one of several specialists.

An Information System is needed to log and track the helpdesk queries. This will enable analysts to see how the equipment is performing overall, whether the helpdesk specialists are sufficiently resourced to solve problems in an acceptable time, and whether there are subject areas where training should be given to employees.

Proposed System Operation

When a new call comes into the helpdesk the names of the caller and helpdesk operator are logged along with the time of the call, the serial number of the computer and, if relevant, the operating system and software being used. The caller's name will be checked against a register of all personnel to retrieve the callers' ID number, job title and department. The equipment will also be checked against a register of equipment to find the equipment type and make. The software will be checked to see if it is under a valid license.

Every call is logged and each problem is given a problem number and this is supplied to the caller so it can be quoted on any subsequent calls about the same problem. The helpdesk operator will also record notes and descriptions of the problem. A reason for each call is always recorded even if it is, in the case of a follow-up call, just a note to say how desperate the caller is getting.

When a problem is first reported the helpdesk operator will also allocate a problem type, selecting it from a list of problem types. It is the skill of the operator to know what problem type is most relevant and how specific the problem is. Some problem types are refinements of more general problem types and so it is possible that the problem type allocation may be altered at a later time if more information becomes available.

When the problem area is identified the helpdesk operator can lookup previous problems of the same type to see if the problem has occurred before and if so how it was resolved. It is also possible to lookup previous problems with the

same equipment or from the same caller to see if there were other related problems.

If the problem can't be solved immediately the helpdesk operator will use the system to look up which specialist to refer the problem. Each specialist will be an expert in one or more problem types. If there is no specialist listed for a more specific problem type then a specialist from the more general problem type will be used. The system will also list how many problems the specialist is currently working on so that if there is more than one specialist for a problem type, the specialist who is currently the least loaded can be allocated.

When a problem is eventually resolved, the helpdesk operator or the specialist will log the date and time it is resolved and record some indication of how the problem is resolved and the time taken to resolve the problem.

Given the Help Desk scenario your tasks are as follows:

This assignment is split into two parts, to be undertaken as separate tasks. Part 1 concerns the design of a database and consists of 2 tasks. Part 1 consists of Entity Relationship Diagrams (Task 1), and Relational Schema (Task 2) must be submitted on Monday Week 4. In Part 2 you will implement the Help Desk database (Task 3) using your design and test the database (Task 4) answering data retrieval requests. This part needs to be submitted on Monday Week 7.

Part 1 - Database design ***40%***

Task 1 – Entity Relationship Diagram (20%)

Create a conceptual data model to represent the data requirements of the Help Desk scenario. Your model should include an E-R diagram and entity headings (listing the attributes associated with entity types). List any assumptions you have made.

Task 2 – Relational Schema (20%)

Using your conceptual data model, develop a relational schema consisting of the definitions of the domains and relations that represent the entity and relationship types, including primary keys, foreign keys and any constraints.

Part 2 - Database implementation and Testing ***30%***

Task 3: Database Implementation (10%)

Use your design to implement the Help Desk database using Oracle DBMS. You should use SQL statements to create tables, insert data and queries to provide the following functionality: (Every SQL including the CREATE and INSERT statements, must be documented and saved using notepad or MS Word)

Task 4 – Database Test (20%)

Test your database by answering the following questions. You must document the SQL statement for each question:

Select Queries

1. *List the details of equipment and associated software.*
2. *Produce a list of experts (support staff) for a given problem area*
3. *Produce a list of all unresolved problems with the assigned Specialist*
4. *Produce a list of problems reported by a member of staff, the details of the support staff who attended the problem and the solution provided by the support staff*
5. *Find (display) the average time taken fix fault for a given problem area.*
6. *Display a list of the most common problems and order them in according to the frequency of their occurrence.*
7. *Display the equipment with the most reported problems showing problem details*
8. *Produce a list of problems that have been solved by helpdesk operator*

Update and Delete Queries

9. *Add a new Specialist to the database*
10. *Assign a specialist for a given problem (it must be an unresolved, unassigned and should find a matching Specialist)*
11. *Update the Call-log with appropriate details when the problem has been resolved.*

12. *An item of Equipment which, has previously had a fault reported, has now become redundant so Delete it from the database.*

Submission instructions - What should be the format of the submission? / Where should it be submitted?

Part 1 Submission

A single Word or PDF document combining Task 1, Task 2 must be submitted via University VLE (Canvas). Follow the notations and standards discussed in week 1 and 2.

- ***Task 1:*** *Your Entity Relationship Diagram, entity listing, constraints and assumptions. The diagram must be neatly drawn.*
- ***Task 2:*** *Your schema definitions, indicating key fields (both primary and foreign keys). Relational Schema must list every attribute for each entity, datatype and constraints*

Part 2 Submission -

A single Word or PDF document combining Task 3 and Task 4 must be submitted via University VLE (Canvas).

- ***Task 3:***
  - *You must implement the database in the ORACLE server.*
  - *You should document the CREATE Table queries in a Text file or Word document. Make sure the script includes the constraints definitions (Primary Key, Foreign Key Definitions and any other constraints).*
  - *You must populate enough sample data (use INSERT Queries). The INSERT queries must be documented in a Text file or word-processed file.*
  - *The above scripts must be included in the document for submission*
- ***Task 4:***
  - *SQL queries you devised to test the database*
    - *For the SELECT queries include the SQL statement and the query result – word processed in the submission document.*
    - *For the UPDATE and DELETE queries include the SQL statement and the systems message in the submission document.*

Hints and tips
e.g. Your report should follow the template provided on the module space. *All submitted work is expected to observe academic standards in terms of referencing, academic writing, use of language etc. Failure to adhere to these instructions may result in your work being awarded a lower grade than it would otherwise deserve**.***
Marking and moderation
Assessment Criteria: *In order to achieve an **A grade (70% and above)**, the work must be excellent in almost all respects, only very minor limitations achieved with no assistance after the review period.* *In order to achieve a **B+ grade (60 – 69%)**, the work should show strength in most respects, but perhaps has limitations in one or two areas achieved with minimal assistance after the review period. A good piece of work nevertheless.* *In order to achieve a **B grade (50 – 59%)**, the work should be of a satisfactory standard, showing strength in some areas, but perhaps let down by poor presentation, or poor written explanations where required, possibly achieved with some assistance after the review period.* *In order to achieve a **C grade (40 – 49%)**, the work should be of a satisfactory standard but may have significant shortcomings in some areas possibly achieved with considerable assistance after the review period. Nevertheless, shows at least a basic understanding of the concepts and a basic practical ability.* *A **Refer (0 – 39%)** will be given to work that is unsatisfactory or contains serious errors/limitations.*
Employability Skills Applied
On successful completion of this module, a student will have had opportunities to demonstrate achievement of the following Employability Skills; *Tick all that apply.*

CORE ATTRIBUTES	
Engaged	✓
Creative	✓
Enterprising	
Ethical	
KEY ATTITUDES	
Commitment	

Curiosity	✓
Resilient	
Confidence	
Adaptability	✓
PRACTICAL SKILLSETS	
Digital fluency	✓
Organisation	✓
Leadership and team working	
Critical thinking	
Emotional intelligence	✓
Communication	

MARKING CRITERIA

TASK	***Refer** 0-39%*	**C** 40-49%	**B** *50-59%*	**B+** *60-69%*	**A** *>=70%*
Task 1 (20) **Entity Relationship diagram**	Poor attempt, inappropriate choice of entities & relations	A number of serious errors, but some evidence of understanding of conceptual design	Satisfactory but with some significant errors/ limitations	As for **A** but with some minor errors/ limitations	Excellent choice of entities and relations
Task 2 (20) **Derivation of Normalised Tables and Schema design**	Poor attempt, inappropriate choice of tables & attributes, foreign keys mostly incorrect	A number of serious errors, but some evidence of understanding of process of deriving normalised tables	Satisfactory but with some significant errors/ limitations	As for **A** but with some minor errors/ limitations	Excellent choice of tables and attributes, primary and foreign keys are correct
Task 3 (10) **Creation of tables with integrity rules implemented** **&** **Creation of indexes with written justifications**	Inappropriate tables, poor attempt at implementing integrity rules	Some tables and associated integrity rules created correctly	Satisfactory but with some significant errors/ limitations	As for **A** but with some minor errors/ limitations	All tables created correctly, including foreign keys. Appropriate implementation of integrity rules
	Little or no evidence of indexes	Little or no evidence of indexes	Satisfactory but with some significant errors/ limitations	As for **A** but with some minor errors/ limitations	Excellent choice, justification, and creation of indexes
Task 4 (20) **Development of queries as described above**	Little or no evidence of successful/ appropriate query development	Some evidence of sensible choice and implementation of queries	Satisfactory but with some significant errors/ limitations	As for **A** but with some minor errors/ limitations	Excellent choice and implementation of queries, demonstrating appropriate use of all required querying techniques