School of Electrical Engineering and Computing

COMP1140: Database and Information Management

Assignment 1:

SCS Resource Management Database Design Project- Requirement Analysis and Conceptual Design

Due: *11:59 pm, Sunday, August 30, 2020*

WORTH 15% of the final assessment mark

1. Background

The School of Computer Science (SCS) at the University of Sunshine manages and lends resources to staff and students for assignment and project purposes. The resources include rooms, cameras, speakers, software, phones, etc.

Managing such services has become cumbersome and the support services of the School of SCS have requested you to develop a database for their application. The project has been named as "SCS Resource Management".

The proposed database system is developed in various modules, including requirements analysis, conceptual database design, logical database design, and physical database design. In this assignment 1, you are required to develop user requirements specification and the conceptual database model for SCS's database based on the business requirements provided in this document and related discussions in lectures.

Your lecturer will act as your client and you can query him for any further information and clarifications.

2. Mission and objectives

The aim of the *SCS Resource Management* project is to ensure the development of an efficient, convenient system for resource sharing in the School.

Main objectives of the project include:

- Organising resources to provide efficient access to them
- Supporting research and academic activities by providing access to the required resources
- Monitoring equipment demand and use to facilitate best practical delivery of resources at SCS

3. Main Features and Business Requirements

In meeting its objectives, the following main features for the proposed resource management system have been identified.

- **Catalogue Service:** Develop a web-based searchable catalogue of all resources. Facilities will be needed to search the catalogue on various criteria including keyword, name, type etc.

- **Loan Service:** The loan service provides facilities to issue and to return resources. Resources can be classified as either movable (which can be taken away) or immovable. Resources are loaned to students or staff members of the School, who are also known as borrowers. The different types of borrowers are provided with varying degrees of privileges. The privileges of students will be affected by the courses they are working on.

- **Acquisitions:** The School consistently updates its resources. Suggestions for acquiring access to newer and updated materials are elicited from staff and students of SCS. Priority is provided for acquisitions pertaining to the teaching and research needs of the university.

- **Reservation Service:** The members should be able to reserve resources (if available) ensuring that they gain access to resources for specific periods of time. Requests for reservations are authorised on a first-come-first-serve basis.

4. Assignment Tasks (individual assignment)

The proposed database system is developed in various modules, including requirements analysis, conceptual database design, logical database design, and physical database design. In this assignment 1, you are required to complete the first two stages of the database design, i.e., to develop user requirements specification and the conceptual database model for the database based on the business requirements provided in this document and related discussions in lectures. There are two parts to be completed in assignment 1 as described below.

You are required to write and submit a report that includes ***all*** the content of the two parts that are described below. The report must be in Microsoft Word. (Note: in addition to submitting a separate Visio file, you must insert the EER into the Word file, and the EER must be within 2 pages.)

Part 1: Requirements

In this assignment, you are required to develop a user requirements specification truly fulfilling the data requirements (to identify what types of data needs to be stored in the database), transaction requirements (to identify the important and frequent database operations – data manipulation and queries), and business rules (which are based on this document and elaborations in lecture) for the database mentioned above.

Assignment submission format for the Requirements part: The requirements document **MUST** have the following sections:

- Data Requirements – outlining the major data items
- Transaction requirements – outlining the data manipulation and queries
- Business Rules

Hint: Sample user requirement documents are discussed in weeks 2 and 3, and are available in appendices A and B of your main textbook.

You may interview your client (i.e. lecturer) for clarification and include your interview questions and responses.

Part 2: EER Model with Data Dictionary

Draw an EER model for the requirements identified in Part 1. The EER Model must be shown in UML notation which is discussed in class and illustrated in our text.

Please note: other notations (other than UML notation discussed/used in the course) will NOT be accepted, i.e., zero mark will be given for the EER model part if a notation other than UML is used.

The EER model should be accompanied by a data dictionary which includes entity type table, relationship type table, and attribute table.

Assignment submission format for the EER Model with Data Dictionary part: The requirements document **MUST** have the following sections:

- EER Model
- Documentation – Data dictionary details (description of entities, relationships and attributes)

The sample format for documenting the data dictionary is provided below (Note: this is for a different database).

Data Dictionary Format: Use the format described in your main text in documenting the data dictionary. The following provides samples for reference.

ENTITY TYPES

Entity Name	Description	Aliases	Occurrence
Collection	A collection is a physical collect items in the library located at a particular physical location		Physical area of the libra divided into a set of collections
…			

RELATIONSHIP TYPES

Entity name	Multiplicity	Relationship	Multiplicity	Entity name
PhysicalCopy	0..*	LocatedIn	1..1	Collection
…				

ATTRIBUTES

Entity Na	Attributes	Description	Data Typ Length	Null	Multi -valued	Derived	Default
Student	studentId	A unique id given to student	Char (5)	N	N	N	
	name	Name of Student	varchar(50)	N	N	N	
	phoneNo	Contact phone no.s	char(12)	Y	Y	N	

Hint: Sample EER models and documentation is provided in Chapter 16 of your text.

The lecturer will discuss the details of the requirements in class as well as act as the client of the system. You need to implement all the details mentioned in lecture as well as described in this document. You are encouraged to ask questions to the lecturer to clarify requirements.

5. Submission

This is an **INDIVIDUAL** assignment.

Method of submission: A softcopy submission is required:

- zip all required files into one zip file. The file name MUST be identified by 4 sections: A1, your first name, your surname, and your student number, e.g., A1SimonLee1234567.zip. It must be submitted to Blackboard -> Assessment -> AssignmentsSubmission-> Assignment1

- In the report file, you **must** have on the front a **signed** copy of the cover sheet (Assessment Item Cover Sheet – Individual) which is available from: http://www.newcastle.edu.au/__data/assets/pdf_file/0008/75383/AssessmentItemCoverSheet.pdf

  Note: **please make sure to fill in your Tutorial Group (i.e., date/time), Tutor's Name,** as well as other items. Otherwise, your submission marking may be delayed.

Note: Ten percent of the possible maximum mark for the assessment item will be deducted for each day or part-day that the item is late. Weekends count as one day in determining the penalty. Assessment items submitted more than five days after the due date will be awarded zero marks.