The University of the West Indies
Department of Computing

COMP3161 – Introduction to Database Management Systems

Assignment 2

(To be completed by a group of up to 4 students for 10 coursework marks)

Background

Consider the following list of basic concepts:

A. A student has an id, name, major, and a faculty
B. A property has a volume and folio number, a location, and an estimated value
C. A vehicle has a model, make, year, an estimated value, and a serial number.
D. An inventory item has a stock code, unit by which it is sold, and a quantity on hand.
E. A book can be either fiction, or nun-fiction and has an author, publisher, and number of pages
F. A receipt is given for payment on a specific invoice and has an amount, and a date of payment.
G. A project activity has a start date, an end date, and a project manager.

Assignment Tasks

a) Develop a set of requirements for a problem that is based on any one of the concepts listed above and draw an entity-relationship diagram (using the Chen notation) for the database solution to the problem. Your attempt will be graded as follows:

i.	Statement of functionality	**[5 pts]**
ii.	Correct syntax (Chen notation strict)	**[5 pts]**
iii.	Appropriate use of a multivalued attribute or a derived attribute.	**[1 pt]**
iv.	Appropriate use of a weak entity	**[1 pt]**
v.	Appropriate use of inclusion of one to one relationship, or total participation in a relationship.	**[1 pt]**
vi.	Appropriate use of many to many relationships.	**[1 pt]**

vii. Neatness **[1 pt]**

b) Convert the ERD in (a) to an equivalent relational schema. **[10 pts]**

c) Identify candidate keys for each relation in (b) **[10 pts]**

d) Discuss the highest normal form that is satisfied by each relation in (b). **[10 pts]**

e) Formulate up to ten (10) CRUD queries on the relational schema that you have developed. Express the queries in **Relational Algebra** and **SQL**: Your responses will be marked for correctness). The queries must include:

i. Two operations that create data **[2 pts]**

ii. Two operations that retrieve data **[2 pts]**

iii. Two operations that update data **[2 pts]**

iv. Two operations that delete date **[2pts]**

v. Two operations of your choice **[2 pts]**

f) Additional pts are awarded for appropriate inclusion of any of the following operations in your responses to (e).

i. Join operation(s) **[1 pt]**
ii. Set difference or union operations or intersection **[1 pt]**
iii. Relational division **[1 pt]**

g. Peer review assessment will be conducted for the remaining points up to 100 points.

Submission Instructions

- Submit a written report (MS Word or PDF format) by midnight **Sunday March 26**.
- A single submission is to be made by one member of the group
- Each submission shall have the id numbers of all group members.
- Late submissions will receive a penalty of 10% per day late.