INFORMATICS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF BUSINESS MANAGEMENT

FOUNDATION PROGRAMME
2022/2023

DOC327 – Working with Data

COURSEWORK - SPECIFICATION

Module Leader	**:**	Rasika Alahakoon
Assessment	**:**	Group Coursework (35%)
Date Set	**:**	31st October 2022
Date Due	**:**	8th December 2022
Submission Time	**:**	12.00 pm

General Coursework Information – Please read carefully

This is a **GROUP** coursework and has to be attempted jointly as a group. You must be in groups of 5-6 students. Appoint a team leader.

Individual statements have to be written to describe the work that has been carried out by an individual. Each team member must attach a signed Individual Statement (self-evaluation sheet) bound with the report. Failure to do so will result in a zero mark being awarded for the entire coursework. You **MUST** use the Coursework Report Template provided.

If you find any ambiguity or a lack of information in any part of the coursework, you should make reasonable assumptions and state them clearly.

You must use a word processor for the report, and it should be presented professionally in accordance with the report format.

It is advisable to keep a copy of your work. Acknowledge all your sources. Remember that plagiarism or collusion or copying are considered serious assessment offences and have severe penalties.

You are required to show all DDL and DML and their corresponding result/output tables (the actual screenshots) in the report, else you will automatically be awarded ZERO marks for the question.

The coursework must be submitted to the IIT LMS on or before the given deadline. Submissions should be in the PDF format and should follow the given naming convention.

<Module code_GCW_GroupNo>.pdf
(For example: DOC327_GCW_Group01.pdf)

The usual University penalties will be applied for late submissions.

PART A (60%)
Healthy Foods – Food Manufacturing Company

"Healthy Foods" Pvt Ltd is a world-famous food manufacturing and distribution company located in Oklahoma, USA. A recently conducted internal survey has revealed, the existing information system is not capable of facilitating the expected business expansions for coming years. Thus, the Information systems manager expects to implement a new information system to streamline the business process. The implementation will be carried out in stages to minimize the disturbances to the daily activities of the company. Hence, re-engineering the system database will be completed in the first stage and the following system requirements were captured during the internal survey.

As the chief system analyst of the company, you are asked to prepare a complete conceptual design for the new database considering the given requirements.

- The company operates several food manufacturing plants, which are responsible for different food creation projects that the company undertakes. A plant is given a specific plant code and has a name, location (city, state), official email, and several customer service contact numbers.
- A project always runs under a certain plant while a plant may handle several projects. Each project has a unique code for identification purposes. Further, the project name, type, start date, duration, end date, budget, and project coordinator need to be recorded. Project type can be 'Regular' or 'Customized' according to the requirement.
- The company maintains separate records for their clients as it is essential to keep track of each project owner. A client may invest on several projects, but a certain project can be owned by only one client who is identified by a client ID. Also, it is important to record the client's name, address, and contact number for future reference.
- The company allocates workers to each and every plant according to their employee SSN number. There are number of workers working in a plant and a worker can be allocated to only one plant during his/her stays at the company. For each worker, the name (first name, Surname), date of birth, gender, address (town, city, state), designation, salary grade and joined date are also recoded. The worker can be contacted through his/her official mobile number or the private contact number.
- Workers are assigned to several projects simultaneously according to the availability. Each project has several workers. The assignment date, and assignment duration will be recorded upon each assignment for a particular project.
- Senior workers mentor other workers, but all workers need not be mentored. A worker is mentored by one another worker, but a worker may mentor several other workers.

- The company provides an employee insurance facility as a reward to the workers. However, it is not mandatory to have an employee insurance. One insurance account is strictly issued for a certain worker and a worker can have no more than one insurance account. For each insurance, unique account number, insurance type, valid period and credit limit need to be recorded.

Question 1

Produce an Entity Relationship Diagram to represent the Conceptual Design of the 'Healthy Foods information system. Use software tools to draw the diagram. You are required to:

- Distinctly show all entity types, attributes (including primary key attributes) and relationship types.
- Determine the structural constraints (cardinality and participation constraints) of each relationship type.
- Describe each relationship type shown in the ER diagram. Clearly state any assumptions made.
- DO NOT include any foreign keys at this stage.
- DO NOT add any attributes (including surrogate/artificial keys) not mentioned in the scenario description.

(40 Marks)

Question 2

Give the data definition statements required to create the tables. Include all the attributes with the primary key definitions. (Foreign keys are not required at this stage)

(20 Marks)

PART B (40%)

THE BLUE BIRD LIBRARY SYSTEM

The Blue Bird Library System contains information about its branches, members, books, loans, and reservations. The relational structure below captures most of the necessary information for the database.

Member	**(memberNo, name, address, telephoneNo, dateOfBirth, status, branchNo*)**
Branch	**(branchNo, name, address, telNo)**
Book Title	**(ISBN, title, author, publisher, year, classification)**
Reservation	**(reservationNo, memberNo*, ISBN*, reservationDate, reservationFulfilled)**
Book Copy	**(copyNo, ISBN*, purchaseDate, purchasePrice, loanType)**
Loan	**(loanId, memberNo*, copyNo*, issueDate, dueDate,returnDate)**
Key: Primary Key	**Foreign Key ***

Member **Table**

memberNo	name	address	telephoneNo	dateOfBirth	status	branchNo
A2345	James Ward	81 George Street, London	020-8456-1122	04/Dec/1980	Staff	B111
R3456	Joan Lees	35 Kings Hill, Edinburgh	01318-234561	14/Jan/1983	Researcher	B222
S4567	Dave Smith	12 Avery Hill, London	020-7822-1024	24/Mar/1986	Student	B111
S7654	Marie Hans	45 The Ash, Dartford	01322-451399	18/Jun/1989	Student	B222
P8764	Sam Jones	17 Lower Street, London	020-7551-1003	16/Nov/1990	Researcher	B111

Branch **Table**

branchNo	name	Address	telNo
B222	Merryhills	115 Kings Street, Edinburgh	01318-333564
B111	Oakwood	32 High Street, London	020-8756-5432

BookTitle **Table**

ISBN	title	author	publisher	year	classification
1201708574	Database Systems	T Connolly	Addison Wesley	2001	Computing
2409708614	Marketing Strategies	G Armstrong	Pitman	1998	Business
4558602453	Business Basics	J Melton	Morgan Kauffman	1993	Business
6547654322	Database Solutions	T Connolly	Addison Wesley	2004	Computing
9876543210	Success in Business	R Burke	Pearsons	2001	Business

Reservation **Table**

reservationNo	memberNo	ISBN	reservationDate	reservationFullfilled
R101	R3456	1201708574	14/Jan/05	Yes
R102	S4567	4558602453	25/Feb/06	No
R103	S7654	4558602453	06/Apr/06	Yes
R104	S4567	1201708574	30/Sep/06	Yes
R105	P8764	9876543210	21/Feb/07	No

***BookCopy* Table**

copyNo	ISBN	purchaseDate	purchasePrice	loanType
C001	1201708574	14/Jan/2005	32.50	Reference
C002	1201708574	12/Feb/2005	38.99	Regular
D001	2409708614	11/Mar/2006	24.99	Short Loan
E001	9876543210	21/Apr/2006	28.99	Reference
E002	9876543210	14/Jan/2007	33.99	One-week

***Loan* Table**

loanId	memberNo	copyNo	issueDate	dueDate	returnDate
L001	A2345	C002	05/Jan/2006	05/Feb/2006	05/Feb/2006
L002	S4567	C002	15/Feb/2006	15/Mar/2006	
L003	R3456	D001	25/Jun/2006	25/Jul/2006	15/Jul/2006
L004	R3456	D001	01/Jan/2007	11/Feb/2007	
L005	P8764	E002	11/Feb/2007	21/Mar/2007	

Write *My SQL* queries and run them for the following questions/cases. Give meaningful names to columns in the output/result table of each query. ***You MUST submit the screenshots of queries and their results/output tables in the report.*** Make sure you clearly label each query/question.

Question 1

Give the DDL (Data Definition Language) statements required to create the tables 'Member, 'Branch', 'Book Title', and 'Reservation'. Include *primary* and *foreign key* definitions.

(20 Marks)

Question 2

Insert data into the tables listed in Question 1.

(a) Populate the tables using the data provided above.

(b) Give the statements required to enter all these records into the tables.

(10 Marks)

Question 3

List all researchers and students registered with the library system. Show their name, address, status, and telephone numbers sorted by member name in alphabetical order.

Give the relevant SQL statements. ***(5 Marks)***

Question 4

List the full details of books which are written on 'Business', published before the beginning of the year 2000.

Give the relevant SQL statements.

(5 Marks)

<<<<**End of coursework specification**>>>>