INFORMATICS INSTITUTE OF TECHNOLOGY

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DEPARTMENT OF BUSINESS MANAGEMENT

FOUNDATION PROGRAMME

2023/2024

DOC327 – WORKING WITH DATA

COURSEWORK - SPECIFICATION

Module Leader	**:** Chathura Wickramasinghe
Assessment	**:** Group Coursework
Date Released	**:** 04th of March 2024
Date Due	**:** 22nd of March 2024
Submission Time	**:** 2:00 PM
Marks Weightage	**:** Document 40%, VIVA 60%

General Coursework Information – Please read carefully.

This **GROUP coursework** must be attempted jointly as a group. Students can find the group details in the DOC327 group details Google sheet, the link to the sheet can be found in the DOC327 module LMS page.

The viva sessions will be scheduled from 25th March 2024 to 29th March 2024.

Individual statements must 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) 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 the report format.

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

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

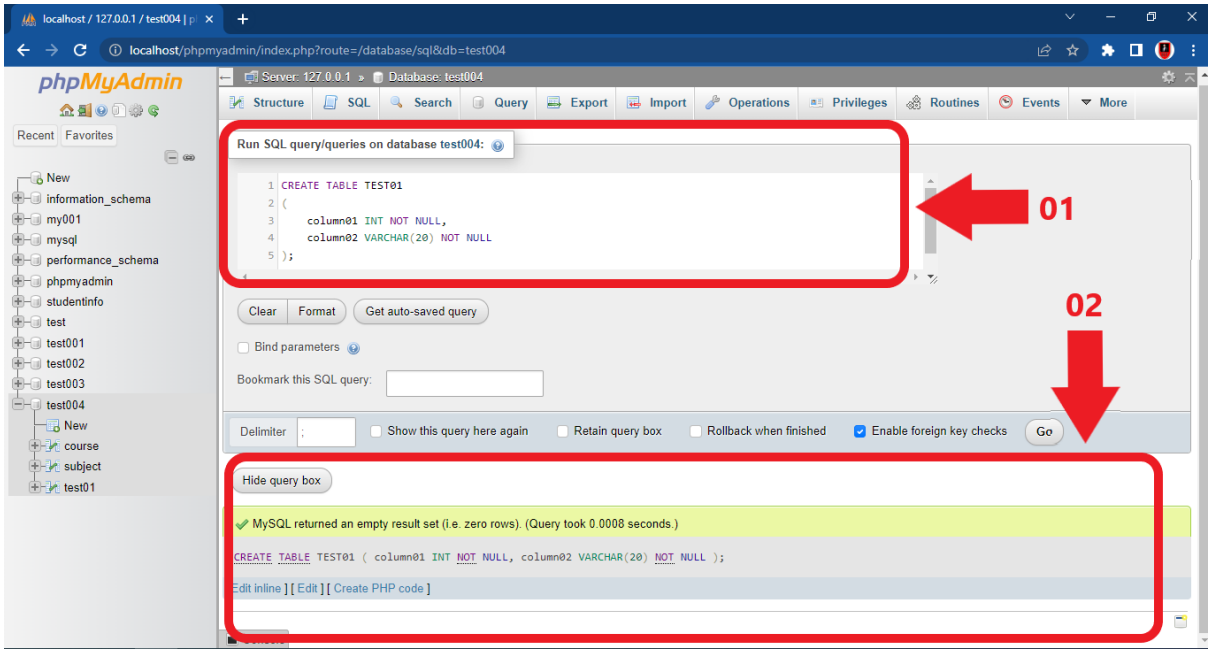

Figure 1 Execution Proof Screen Capture

As shown in figure 01 your screen capture should have the parts below.

01. The SQL query.
02. Query execution proof.

***Before submitting the document check the readability of the contents in the included screen captures. Documents with pixelated screen captures will be awarded 0 marks.**

Marks will be awarded **only** for the Entity Relationship Diagrams designed using the **UML notation**. **Diagrams designed using any of the other notations will be awarded 0 marks.**

Submission Instructions

- There will be a mark allocation for the final document. Therefore, submitting the answers in a properly compiled report is a must.

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

  <Module code_GCW-batch_GroupNo>.pdf
  (For example: DOC327_Jan2024_GCW_Group01.pdf)

Important Notes:

- The usual University penalties will be applied for late submissions.
- **Each group is required to demonstrate their own SQL query codes in the VIVA using phpMyAdmin.**

PART A (50%)

The following is about the operations and the data of a DVD rental company called Informatics, which is in London. Informatics is a popular movie DVD rental platform in the UK. They provide rent movie DVDs and a set of functionalities and options related to DVD renting. The scenario below describes different functionalities provided by Informatics.

Data Requirements:

- The Informatics DVD rental company has several branches throughout the United States. The data held with branch details are the branch address made up of street, city, state, and zip code, and the telephone number. Each branch is given a branch number, which is unique throughout the company.

- Each branch is allocated staff, which includes a manager. The Manager is responsible for the day-to-day running of a given branch. The data held on a member of staff is his or her name (consisting of first name and family name), position, address, and salary. Each member of staff is given a staff number, which is unique throughout the company. Each branch is managed by a branch manager and the staff members who don't belong to the manager category are managed by the manager.

- Each branch has a stock of DVDs. The data held on a DVD is the catalog number, DVD number, title, category, daily rental, cost, status, and the names of the main actors and the director. The catalog number uniquely identifies each DVD.

- However, in most cases, there are several copies of each DVD at a branch, and the individual copies are identified using the DVD number. A DVD is given a category such as Action, Adult, Children, Drama, Horror, or Sci-Fi. The status indicates whether a specific copy of a DVD is available for rent.

- Before borrowing a DVD from the company, a customer must first register as a member of a local branch. The data held on a member is the first and last name, address, and the date that the member registered at a branch.

- Each member is given a member number, which is unique throughout all branches of the company. Once registered, a member is free to rent DVDs, up to a maximum of ten at any one time.

- The data held on each DVD rented is the rental number, the full name and number of the member, the DVD number, title, and daily rental, and the dates the DVD is rented out and returned. The DVD number is unique throughout the company.

Question 1

Produce an Entity Relationship Diagram to represent the Conceptual Design of the Informatics Systems scenario. Use a software tool to draw the diagram. Use only **UML notation**. You are required to:

1. Distinctly show all entity types, attributes (including primary key attributes), and relationship types.
2. Determine the structural constraints (cardinality and participation constraints) of each relationship type.

- Clearly state any assumptions made.
- **DO NOT include any foreign keys at this stage.**
- Marks will be awarded for the identification of different types of entities, identification of different types of attributes, coming up with suitable keys, and any additional details that you might think will help increase the Informatics systems' operational efficiency.

(35 Marks)

Question 2

Give the data definition (DDL) statements required to create the tables. Include **only** primary key definitions.

(10 Marks)

Question 3

Mention candidate keys, primary keys, composite keys, surrogate keys, and foreign keys for your identified entities if they have the keys. Mention the entity name, the name of the key, and the attribute name.

(05 Marks)

PART B (50%)

The Westminster Hospital System

The Westminster Hospital System contains information about Consult, Department, Diagnosis, Doctor, Patient, Prescription, and Test. The relational structure below captures most of the necessary information for the database.

Refer to the tables given below.

Table Details	
Key	**Primary Key Foreign Key* (Primary Keys are Underlined and Foreign Keys are with *)**
Consult	**consultID, patientSSN*, doctorID*,** dateTime, typeofConsult, **prescription***, **diagnosisID***, **test***
Department	**departmentID**, departmentName
Diagnosis	**id**, description
Doctor	**doctorID**, fName, lName, contact, address, **department***
Patient	**ssn,** fName, lName, dob, address, gender
Prescription	**precID**, details
Test	**testID**, description

Consult Table

Consult							
conultID	**patientSSN**	**doctorID**	**dateTime**	**typeOfConsult**	**prescription**	**diagnosisID**	**tests**
cs01	AAGG8822	D123	1/31/22 8:35 AM	General Consultation	p01	D098	TS01
cs02	pa03	DC556	2/1/22 8:35 AM	Ear Checkup	p02	D099	TS002
cs03	pa24	DC124	2/2/22 8:35 AM	Emergency Treatment	p03	D100	TS003
cs04	pa27	DC13335	2/3/22 8:35 AM	Routine Check UP	p04	D101	TS004
cs05	pa28	D123	2/4/22 8:35 AM	Consult	p05	D102	TS005
cs06	pa29	DC2234	2/5/22 8:35 AM	Consult	p06	D103	TS06
cs07	pa30	DC3345	2/6/22 8:35 AM	Consult	p07	D104	

Department Table

Department Table	
departmentID	**departmentName**
CAD01	Emergency Treatment
CAD02	Cardiology
DAC01	General Care and Surgery
ECU01	Outpatient
ENT01	E N T
NRL01	Neurology
OBGN01	Obstetrics, Gynecology & Neonatal
OT01	Orthopedic
PED01	Pediatric

Diagnosis Table

Diagnosis	
id	**description**
D098	Noncardiac Chest Pain
D099	TMJ syndrome
D100	Pneumothorax
D101	Vitamin Deficiency
D102	Vitamin Deficiency
D103	Minor concussion
D104	Sleeping disorder

Doctor Table

Doctor Table					
doctorID	**fName**	**lName**	**contact**	**address**	**department**
D1134	Maggie	Pierce	11234432	33, Redwood Rd, Staffordshire	CAD02
D123	Miranda	Bailey	11234467	12 Park Road, London	DAC01
D334	Meredeth	Grey	11234543	22, Keele	DAC01
D435	Derek	Shepherd	11234568	12 Fairview, Mount Bay	NRL01
D554	Christina	Yang	11234564	33, Victoria Place	CAD01
D665	Owen	Hunt	12344432	55 Kwan Avenue Swinburne	CAD01
DC124	April	Kepner	11234324	34 East London	ECU01
DC13335	Addison	Montgomery	11234563	12, Park View Terrace	OBGN01
DC2234	Alex	Karev	11234543	22 Redmond Street	PED01
DC3345	Callie	Torres	11234533	14, Berry Bell Avenue	OT01
DC556	Mark	Sloan	11234567	12 New Castle, London	ENT01

Patient Table

Patient					
ssn	**fName**	**lName**	**dob**	**address**	**gender**
AAGG8822	Sam	Smith	12/9/1998	71 Cherry Court, SOUTHAMPTON	Male
pa03	Damien	Johnes	5/1/1978	60 Park Terrace, Girton	Male
pa23	Noah	Williams	4/1/1985	56 Bootham Terrace, Redhill	Male
pa24	Oliver	Brown	3/6/1994	5 Folkestone Road, Winskill	Male
pa25	George	Evans	2/6/1990	5 Connery Rd, Maiden's Green	Male
pa26	Olivia	Stevens	2/10/1984	1 Carnaby Street, Sidcup	Female
pa27	Octavia	Jenkins	11/4/1989	34 Abbey Road, London	Female
pa28	Anne	Pearson	12/12/1992	The Gables, London	Female
pa29	Meryl	Murray	5/9/1995	15 Manchester Road, Doncaster	Female
pa30	Leo	Cooke	3/7/1991	483 The Grove, HEMEL HEMPSTEAD	Male

Prescription Table

Prescription	
precID	**details**
p01	500mg of Amoxicillin, three times a day for seven days.
p02	Phenoxy methyl penicillin 500mg b.d. for splenectomy prophylaxis
p03	Esomeprazole 40 mg twice a day
p04	Indomethacin 20 three times a day 5 days
p05	Zaart 50 two times a day before meals one month

Test Table

Test	
test ID	**description**
TS001	CBC
TS002	Sn345
TS003	DF 234 with urine Culture
TS004	23CDD WBC with Urine culture
TS005	FBC

Question 1

Reverse-engineer the tables given above, use the details, and draw the ER diagram.

Use only **UML notation**. 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.
  - Clearly state any assumptions made.
  - Marks will be awarded for the identification of different types of entities, identification of different types of attributes, coming up with suitable keys, and any additional details that you might think will help to increase the operational efficiency of the Informatics systems.

(25 Marks)

Question 2

Give the DDL (Data Definition Language) statements required to create all the tables above. **Include *primary* and *foreign key* definitions.**

(15 Marks)

Question 3

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)

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