COMSATS University Islamabad, Sahiwal Campus

Course Title:	Database Systems			Course Code:	CSC270	Credit Hrs	3,1
Course Instructor:	Syed Nasir Mehdi			Programme Name:	BCS		
Semester:	5	Batch:	SP22	Section:	A	Deadline	23rd May, 2024
Time Allowed:				**Maximum Marks:**		10	
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CLO/SO	**CLO 3-**						

Important Instructions / Guidelines:

Read the question paper carefully and answer the questions according to their statements.
Take care of the deadline. Don't use chatGPT, solve it yourselves.

Assignment 3

Q 1. Develop the logical design using the given data.

a. Using the normalization steps described in book chapter, develop a set of 3NF relations for each of the four user views.

User View 1: Patient Bill

Functional Dependencies:

1. Patient # -> Patient Name, Date Admitted, Date Discharged
2. Code -> Description, Total Charge

3NF Relations:

1. **Patient**

- Patient# (PK)
- PatientName
- DateAdmitted
- DateDischarged

2. **Charge**

- Patient# (FK)
- Code (PK)
- Description
- TotalCharge

User View 2: Room Utilization Report

Functional Dependencies:

1. Patient # -> Patient Name, Exp Discharge Date

2. Location, Accom -> Patient #

3NF Relations:

1. **Patient**

- Patient# (PK)
- PatientName
- ExpDischargeDate

2. **RoomUtilization**

- Location (PK)
- Accom (PK)
- Patient# (FK)

User View 3: Patient Display Report

Functional Dependencies:

1. Patient # -> Patient Name, Patient Address, City-State-Zip, Date Admitted, Date Discharged, Location, Extension, Insurance

3NF Relations:

1. **Patient**

- Patient# (PK)
- PatientName
- PatientAddress
- CityStateZip
- DateAdmitted
- DateDischarged
- Location
- Extension
- Insurance

b. For each user view, draw a relational schema for the 3NF relations you developed in a. be sure to show the functional dependencies and referential integrity constraints for each schema.

User View 1:

Patient

- Patient# (PK)
- PatientName
- DateAdmitted
- DateDischarged

Charge

- Patient# (FK)
- Code (PK)
- Description
- TotalCharge

Functional Dependencies:

1. Patient# -> PatientName, DateAdmitted, DateDischarged
2. Code -> Description, TotalCharge

Referential Integrity:

- Patient# in Charge references Patient# in Patient.

User View 2:

Patient

- Patient# (PK)
- PatientName
- ExpDischargeDate

RoomUtilization

- Location (PK)
- Accom (PK)
- Patient# (FK)

Functional Dependencies:

1. Patient# -> PatientName, ExpDischargeDate
2. Location, Accom -> Patient#

Referential Integrity:

- Patient# in RoomUtilization references Patient# in Patient.

User View 3:

Patient

- Patient# (PK)
- PatientName
- PatientAddress
- CityStateZip
- DateAdmitted
- DateDischarged
- Location

- Extension
- Insurance

Functional Dependencies:

1. Patient# -> PatientName, PatientAddress, City-State-Zip, Date Admitted, Date Discharged, Location, Extension, Insurance

c. Merge the relations for the four user views into a single set of 3NF relations, using the guidelines presented in this chapter. Draw a single relational schema for the 3 user views and show the referential integrity constraints.

Merged Relations:

1. **Patient**

- Patient# (PK)
- PatientName
- PatientAddress
- CityStateZip
- DateAdmitted
- DateDischarged
- Location
- Extension
- Insurance
- ExpDischargeDate

2. **Charge**

- Patient# (FK)
- Code (PK)
- Description
- TotalCharge

3. **RoomUtilization**

- Location (PK)
- Accom (PK)
- Patient# (FK)

Merged Functional Dependencies:

1. Patient# -> PatientName, PatientAddress, CityStateZip, DateAdmitted, DateDischarged, Location, Extension, Insurance, ExpDischargeDate
2. Code -> Description, TotalCharge
3. Location, Accom -> Patient#

Referential Integrity Constraints:

- Patient# in Charge references Patient# in Patient.
- Patient# in RoomUtilization references Patient# in Patient.

Merged Relational Schema:

Patient

Patient# (PK)
PatientName
PatientAddress
CityStateZip
DateAdmitted
DateDischarged
Location
Extension
Insurance
ExpDischargeDate

Charge

Patient# (FK)
Code (PK)
Description
TotalCharge

RoomUtilization

Location (PK)
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