Faculty of Computing and Information Technology (FCIT)
Department of IT (DIT)
Database Systems - ASSIGNMENT#2
BS(IT) - Fall 2022 (Semester Spring 2022)

Total Marks: 120 Deadline: **June 13, 2022**

Instructions

- You must complete all tasks individually. Absolutely **NO** collaboration is allowed.
- Any traces of plagiarism/cheating would result in an "F" grade in this course.
- Late submissions will **NOT** be accepted, in any case.
- You are also required to submit .docx (Microsoft Word) file to the TAs.
- Name of your file should be **YourRollNumber_Normalization_Assignment** e.g. BITF20M0XX_ Normalization_Assignment. Use the same title as a subject of your email for submission.

Books

A. Carlos Coronel, Steve Morris, "Database Systems" Design, Implementation, Management, 13th Edition" P 6-10
B. Jeffrey Hoffer, "Modern Database Management" Design, Implementation, Management, 12th Edition" 4.57, 4.58
C. Thomas Connolly, "Database Systems: A Practical Approach to Design, Implementation and Management (6th Ed.)" 14.19, 14.20

Quesition#1[10]

Normalize up to 3rd NF.

Accountant Number	Skill Number	Skill Category	Proficiency Number	Accountant Name	Accountant Age	Group Number	Group City	Group Supervisor
21	113	Systems	3	Tahir	55	52	ISD	Sohaib
35	113 179 204	Systems Tax Audit	5 1 6	Zeeshan	32	44	LHR	Saif
50	179	Tax	2	Rehan	40	44	LHR	Saif
77	148 179	Consulting Tax	6 6	Asad	52	25	ISD	Sohaib

Quesition#2 [10]

Normalize up to BCNF.

Visit No.	VisitDate	PatNo	PatAge	PatCity	PhyNo	PhySpecialty	Diagnosis
V10020	1/13/2007	P1	35	DENVER	D1	INTERNIST	EAR INFECTION
V10020	1/13/2007	P1	35	DENVER	D2	NURSE PRACTIONER	INFLUENZZ
V93030	1/202007	P3	17	ENGLEWOOD	D2	NURSE PRACTIONER	PREGNANCY
V82110	1/18/2007	P2	60	BOULDER	D3	CARDIOLOGIST	MURMUR

Quesition#3 [15]

Book A: Problem 6-10

Quesition#4 [15]

Book B: Problem 4.57

Quesition#5 [15]

Book B: Problem 4.58

Quesition#6 [15]

Book C: Problem 14.19

Quesition#7 [10]

Consider the relation R(V, W, X, Y, Z) with functional dependencies

F = {Z → Y, Y → Z, X → Y,X → V, VW → X}.

a. Find the X-closure of all the attributes A,B,C,D, and E
b. Find all candidate keys.

Quesition#8 [15]

You are given the below functional dependencies for relation R(A,B,C,D,E),

F = {AB → C, AB → D, D → A, BC → D, BC → E}.

a. Find all candidate keys.
b. Identify the best normal form that R satisfies (1NF, 2NF, 3NF, or BCNF).
c. Is this relation in BCNF? If not, show all dependencies that violate it.
d. Is this relation in 3NF? If not, show all dependencies that violate it.

Quesition#9 [15]

You are given the below set of functional dependencies for a relation R(A,B,C,D,E,F,G),

F = {AD → BF, CD → EGC, BD → F, E → D, F → C, D → F}.

a. Find all candidate keys.
b. Find F-closure.
c. Find the minimal cover for the above set of functional dependencies.