CSE 370– Database Systems

Assignment 4

Spring 23

Submission Instructions:

1. Write your name, id, section on top of the first page
2. Solution should be **HAND WRITTEN,** take picture and **make PDF.**
3. Submit Online on the following form: https://forms.gle/Rj1xZVp9Q94TN3V56
4. <mark>Submission Deadline: 27th April, Thursday 11:59 pm (midnight)</mark>
5. **NO LATE SUBMISSION WILL BE ACCEPTED. You are getting more than 2 weeks!!!**

QUESTION 1 [10 Points]:

X	Y	Z	A
abcefg	1	q	10
xyz	2	p	11
feg	3	q	12
xyz	2	p	13
abcdefg	3	q	10

Find out which of the following dependencies are valid or invalid. For each dependency, briefly write the reasons.

A. X -> YZ
B. X -> Z
C. XY -> A
D. A -> XYZ
E. YZ -> X

Consider the following relation:

Computer_Repair(<u>Comp_ID</u>, <u>Engineer_ID</u>, <u>Date_Assigned</u>, Customer_name, address, phone, Engineer_Name, Date_Repaired, Issue, Priority_Level, Service_Charge, Commission_Percentage, Total_Repairs)

The primary key of the relation is underlined

The relation has the following additional functional dependencies:

FD1: Engineer_ID→ Engineer_Name, Total_Repairs, Commission_Percentage
FD2: Comp_ID → Customer_name, address, phone
FD3: Comp_ID, Date_assigned→ Issue, Priority_level, Service_Charge
FD4: Total_Repairs → Commission_Percentage
FD5: Priority_level → Service_Charge

i. Explain if this is in 1NF or not. If not, decompose it to 1NF.   [2]
ii. Explain if this is in 2NF or not. If not, decompose it to 2NF.   [4]
iii. Explain if this is in 3NF or not. If not, decompose it to 3NF.   [4]