İstanbul Bilgi University

Department of Computer Engineering

FALL, 2018

Campus: Santral

CMPE 351
DATABASE SYSTEMS I

Homework 5: Normal Forms, RA, others

Make sure that you explain in detail all your steps - thoughts. You may get extra points for an appropriate observation, you may lose some marks due to an obscure solution.

1. Consider the ER schema of relation F= (A, B, C, {D}, E, F). Knowing that there are the following (functional) dependencies: fd1: $\{A\} \rightarrow \{C, E\}$, fd2: $\{A\} \rightarrow \{D\}$, fd3: $\{A, B\} \rightarrow \{F\}$.

(a) {5 points} Is F in 1NF? If yes why? If not modify F so as to put it in 1NF. Let us call F1 the result of this step

(b) {10 points} Is F1 in 2NF? If yes why? If not modify F1 so as to put it in 2NF. Let us call F2 the result of this step

(c) {5 points} Is F2 in 3NF? If yes why? If not modify F3 so as to put it in 3NF

2. Consider the following schema:
Employee = (Ssn, Name, Address)
works_on = (W_Ssn, W_Dnumber, Since)
Department = (Dnumber, Dname, MgrSsn), where MgrSsn is a foreign key corresponding to the Ssn of the employee who manages that department, this is the implicit implementation of 'manages' (!!!).

(a) {20 points} Draw the ER diagram corresponding to the given schema

(b) {20 points} Use relational algebra formal language to retrieve the address of all employees working in Dnumber=2

(c) Give the catalogue of this database

Note: We will check this homework together during the lectures'hours.
Resource: Normal Forms' chapter from the Elmasri & Navathe book.