İstanbul Bilgi University

Department of Computer Engineering

FALL, 2020

Campus: Santral

CMPE351
DATABASE SYSTEMS I

Quiz 3 (afternoon)

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. ***PLEASE, do write your Name, Surname and student's number on the TOP of the answer sheets.***

1. {100 points} Consider the Hotel database[1] :

(a) This exam is for students with the students' number ending by 0, 2, 4, 6, 8:
Knowing that a customer can make more than one reservation and one reservation is made by only one customer, analyze the given schema:
ResCust= (Res_No, Deadline, C_id, C_name, C_address(Street, City))

(i) {20 points} Draw all functional dependencies (fds)
(ii) {5 points} Create a meaningful snapshot by populating the table ResCust with, at least, 5 rows
(iii) {5+10+ 5 points} Discuss insertion, deletion and modification anomalies
(iv) {10 points} Is ResCust in 1NF? If yes WHY[2]? If not modify ResCust so as to put it in 1NF. Let us call ResCust1 the main relation resulting out of this step
(v) {5 points} Draw the fds of ResCust1
(vi) {10 points} Is ResCust1 in 2NF? If yes WHY[2]? If not modify ResCust1 so as to put it in 2NF. Let us call ResCust2a and ResCust2b the two new relations, i.e. the two relations resulting out of this step
(vii) {20 points} Is ResCust1 in 3NF? If yes WHY[2]? If not, modify ResCust1 so as to put it in 3NF. Let us call ResCust3a and ResCust3b the two new relations, i.e. the two relations resulting out of this step
(viii) {10 points} Draw the fds of ResCust3a and ResCust3b

[1] Ref: Example Quiz: Hotel database with my solution in the synchronous folder of week3
[2] No points without a valid explanation

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(b) This exam is for students with the students' number ending by 1, 3, 5, 7, 9:
Knowing that one reservation can book more than one room and one room may be booked by more than one reservation, at different times, and the same room may have different prices in different reservations, analyze the given schema:
ResRoom = (Res_No, Deadline, State, {Room_id}, price, type)

(i) {20 points} Draw all functional dependencies (fds)
(ii) {5 points} Create a meaningful snapshot by populating the table ResRoom with, at least, 5 rows
(iii) {5+5+5 points} Discuss insertion, deletion and modification anomalies
(iv) {10 points} Is ResRoom in 1NF? If yes WHY[3]? If not modify ResRoom so as to put it in 1NF. Let us call ResRoom1a and ResRoom1b the (only) 2 relations resulting out of this step
(v) {10 points} Draw the fds of ResRoom1a and ResRoom1b
(vi) {25 points} Are ResRoom1a and ResRoom1b in 2NF? If yes WHY[3]? If not modify them so as to put it in 2NF. Let us call ResRoom2a and ResRoom2b the new relations, i.e. the relation resulting out of this step
(vii) {10 points} Draw the fds of ResRoom2a and ResRoom2b
(viii) {5 points} Are ResRoom2a and ResRoom2b in 3NF? If yes WHY[3]? If not, modify them so as to put them in 3NF

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[3]No points without a valid explanation