İstanbul Bilgi University

Department of Computer Engineering

FALL, 2020

Campus: Santral

CMPE351
DATABASE SYSTEMS I

Quiz 1 (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.

1. Your task is to design a database for a small train company storing information about TRAIN(s), TRIP(s), SEAT(s) and STATION(s). Considering (ONLY) that:

(a) One train makes a trip passing through different stations; that is, every trip starts from one station and ends into another one, but it has also intermediate stations

(b) A trip offers seats and for every seat it is necessary to store *also* its "price" and "state" (free, reserved, booked). Be careful because *information about the state of the seat are kept for each trip*; that is, a "seat_number" is unique only within one trip (10 points)

(c) Every station has *at least* a unique "name", a composite "address" (5 points), and a multi-valued "telephone" attributes (5 points)

(d) Every seat has only the "seat_no", "price" and "state" attributes (10 points)

(e) Every train makes more than one trip and a trip is made by only one train (5 points)

(f) One trip passes through different stations and a station is visited by more than one trips (5 points)

(g) All stations in the database are visited by *at least* one trip (5 points)

(h) For every trip and station it is important to memorize the departure and arrival times (5+5 points)

(i) The database stores info of *old* trains, which do not make trips any more (5 points)

Questions:

(i) {5 + 5 points} Design the ER diagram and schema

(ii) {5 + 5 points} Which type of relationships do you have? Discuss both the cardinality and the participation constraints

(iii) {10 points} Give the corresponding relational schema of your database

(iv) {5 points} Give a possible snapshot of your database containing at least 5 (IF mean full 5 points more) entries