

Istanbul Bilgi University

Department of Computer Engineering

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Campus: Santral

CMPE351 DATABASE SYSTEMS I

Homework 3

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

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

Note: We will check this homework together during the lectures'hours.

Resources: Chapter1, par.2.1, chapter3, par.4.1, chapter 7 of the Elmasri & Navathe book.
