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Database

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Evaluation test 2 solution

OpenCourseWare

Database
Bachelor in Data Science and Engineering

Middle Exam (1,5 P)

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<u>QUIZ (0,5)</u>

Take the quiz in this paper, there is **only one correct option**. (Correct option: +0.1 p; Incorrect option: -0.05 p).

SOLUTIONS ARE MARKED WITH *

Question 1: According to the following schemes. If you want to represent "*A movie is directed by one or more directors*", what is the correct design option?

A)

MOVIE (<u>code,</u> Title, Year, Time, Lang, Country, code_Director)

└→ DIRECTOR (<u>code</u>, Fname, Lname)

B)   (*)

┌→ MOVIE (<u>Code,</u> Title, Year, Time, Lang, country)

MOVIE_DIRECTOR (<u>Code_Movie, Code_Director</u>)

└→ DIRECTOR (<u>Code</u>, Fname, Lname)

Question 2: According to the following scheme. Could we insert the following tuple? <'Mary', 'M', 'March', 889977664, '1970-03-05', 'Av. University, 30', Woman, 28911, 40000, 80>

Domain:

	Attribute	Definition	Name
	Sex	Character: size 1 Value: M or F	Domain_Sex

EMPLOYEE (Fname, Minit, Lname, <u>Ssn</u> ,Bdate, Address, **Sex**, Salary, Super_ssn,)

A.   YES
B.   (*) NO

Question 3: If the insertion Insert <'Mary', 'F', 'Brown', '577678989', '1969-03-20', '1287 Windswept, Katy, TX', F, 28000, '987654321', 5> into EMPLOYEE is to be performed. What is the correct option?

EMPLOYEE (Fname, Minit, Lname, <u>Ssn</u> ,Bdate, Address, Sex, Salary. Super_ssn, Dno)

DEPARTMENT (Dname, <u>Dnumber</u>, Mgr_ssn, Mgr_start_date)

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date
Research	5	333445555	1988-05-22
Administration	4	987654321	1995-01-01
Headquarters	1	888665555	1981-06-19

A. The operation is not acceptable because the referential integrity constraint is violated.
B. (*) The operation is acceptable.

Question 4: According to the following scheme. If you want to delete a department in the DEPARTMENT relation, but there are employees of the EMPLOYEE relation that are associated with this department. What is the correct option?
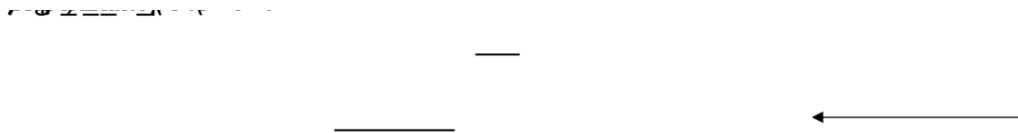
A. (*) Deletion is not performed (the deletion operation is rejected).
B. The deletion can be done, then: the department will be deleted and all employees associated with that department will also be deleted from the DB.

Question 5. According to the following scheme, does this instance have any inconsistency?

MOVIE (<u>Code, Title, Year</u>, Time, Lang, Country, Code_Director)

Code	Title	Year	Time	Lang	Country	Code_Director
901	Vertigo	1958	128	English	UK	201
1230	Vertigo	2019	122	English	UK	230
915	Titanic	1997	194	English	UK	215

a) YES

b) (*) NO

Problem 2 (1 P)

We want to design a Database for the management of traffic fines in Spain. The following semantic assumptions correspond to a simplification of reality.

The requirements of this database are:

It is required to store information about drivers who are characterized by a ID, their name, date of birth and have a driving license that includes date and place of issuance of the card and expiration date as well as a type (B, C1 , ...). For instance, a B driving license allows you to drive vehicles with a weight < 3.500 kg and an A driving license authorizes you to drive motorcycles. A driver can have more than one type of license, each one with its corresponding data and place of issuance as well as expiration date. The database keeps information about the different driving licenses of a driver.

Each driver may be the owner of several cars but one vehicle has only one owner in the database. For each vehicle, we will want to store its license plate, brand, model, VIN (Vehicle identification number), date and place of issuance of the vehicle registration, cylinder capacity (in cm^3) and maximum net power.

The sanctions are imposed by traffic agents (in each report there is a notifying agent and a witness agent). Each agent has an identifier and a name. It is interesting to store which driver committed the infraction and with which vehicle.

The penalties, according to their severity, penalize with loss of driving license points (for example, driving under the influence of narcotic drugs, psychotropic drugs, stimulants and other substances with similar effects means a loss of 6 pts. in addition to the economic penalty).
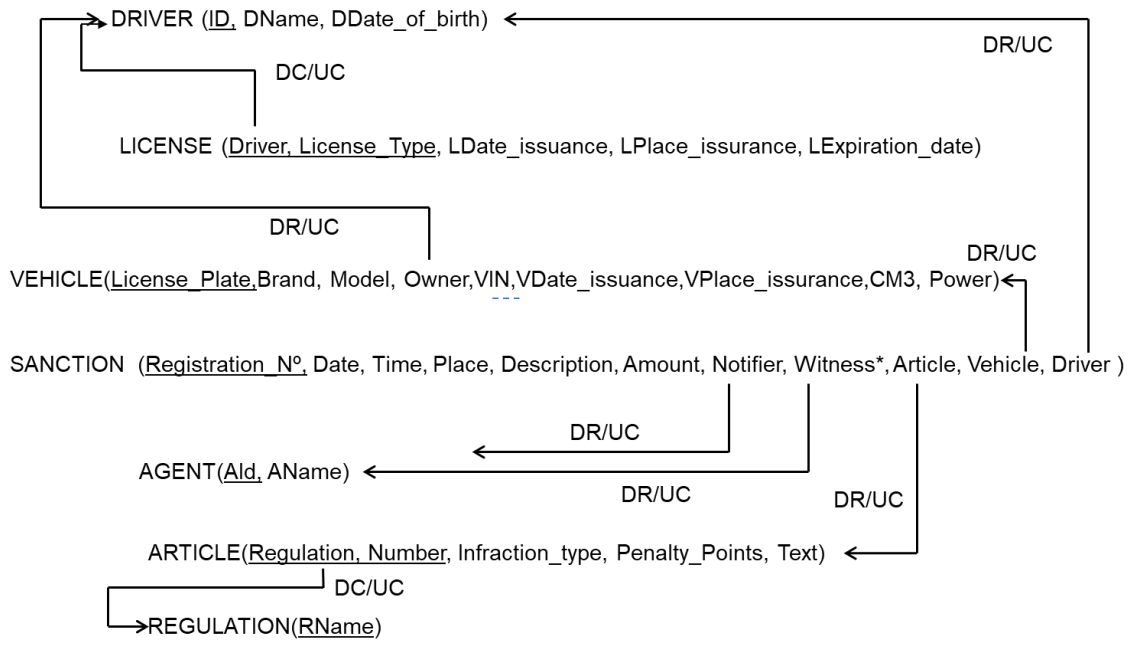
Each sanction is identified by a registration number, a date and time of the complaint, place of the route (for example, KM 32 of the A5), is characterized by a brief description, the penalty points and amount to be paid. In addition, each sanction corresponds to an infringed precept characterized by a regulation and a certain article (for example, article 48 of the General Traffic Regulation that corresponds to speeding in urban areas or article 12 of Drivers Regulation).

We will have the regulations stored with their corresponding articles (the numbers of the articles can be repeated between different regulations). Each article represents an infraction of a type (very serious, serious and slight), and it has a penalty of points (maybe none). The text of the articles is also stored.

You must:

   a) Obtain the relational schema/diagram according to requirements with the primary and alternative keys. Indicate the foreign keys with their delete and update options.
   b) Write additional semantic assumptions to the statement, if needed
   c) Write additional semantic assumptions to the scheme, if needed

Proposed solution:

DRIVER (<u>ID,</u> DName, DDate_of_birth) ←

DR/UC

DC/UC

LICENSE (<u>Driver, License_Type</u>, LDate_issuance, LPlace_issurance, LExpiration_date)

DR/UC

DR/UC

VEHICLE(<u>License_Plate,</u>Brand, Model, Owner,VIN,VDate_issuance,VPlace_issurance,CM3, Power)←

SANCTION (<u>Registration_Nº,</u> Date, Time, Place, Description, Amount, Notifier, Witness*, Article, Vehicle, Driver)

DR/UC

AGENT(<u>AId,</u> AName) ←

DR/UC

DR/UC

ARTICLE(<u>Regulation, Number</u>, Infraction_type, Penalty_Points, Text) ←

DC/UC

REGULATION(<u>RName</u>)

Some Semantic Assumptions:

License_Type= {A, B, C1, ...}

Infraction_type={very serious, serious, slight}