Relational model exercises

Exercise 1

The following relational table is given (primary keys are underlined, optional attributes are indicated with "*"):

LESSON (CourseCode, Date, Time, Classroom, Teacher Code*)

Check if the following relational table instance LESSON is correct based on the schema definition of the table. Justify your answer.

LESSON

CourseCode	**Date**	**Time**	**Classroom**	**TeacherCode***
01_TA	17/10/2021	10:00	12A	DID1
02_XA	22/1/2022	17:00	NULL	DID2
011_TO	30/9/2021	NULL	11	DID3
07_XB	18/12/2021	15:00	2P	DID3
07_XB	18/12/2021	15:00	21A	DID4
20_7TT	2/2/2022	21:00	12B	NULL

Exercise 2

The following relational tables are given (primary keys are underlined, optional attributes are indicated with "*"):

OFFERED_SERVICES (CompanyID, ServiceID, Amount)
USED_SERVICES (CompanyID, ServiceID, Date)

Note: The attribute pair (CompanyID, ServiceID) in the USED_SERVICES table refers to the attribute pair (CompanyID, ServiceID) in the OFFERED_SERVICES table.

Check if the following instances of the relational tables SERVICES_OFFER and SERVICES_USED are correct according to the schema definition of the two tables. Justify your answer.

OFFERED_SERVICES

CompanyID	ServiceID	Amount
A1	S1	100
A1	S2	200
A2	S1	150
A3	S3	150

USED_SERVICES

CompanyID	ServiceID	Date
A1	S1	2022-10-01
A1	S2	2022-10-14
A2	S1	2022-10-14
A1	S1	2022-10-01
A1	S3	2022-10-01
C1	S2	NULL

Exercise 3

The following relational tables are given (primary keys are underlined, optional attributes are indicated with "*"):

CUSTOMER (CustomerID, Name, Surname, Private, email, tel*)
WEBSITE (Domain, CustomerID, ExpirationDate)
STATISTICS (Domain, Date, #visitors)

- The CustomerID attribute in the WEBSITE table refers to CustomerID in the CUSTOMER table
- The Domain attribute in the STATISTICS table refers to Domain in the WEBSITE table.
- The Private field of the CUSTOMER table is of type Boolean (True or False).

Check if the following instances of the tables CLIENT, WEBSITE and STATISTICS are correct according to the definition of the table schemas. Justify your answer.

CLIENT

ClientID	**Name**	**Surname**	**Private**	**email**	**tel***
1	Mario	Rossi	True	m.rossi@gmail.com	NULL
2	Linda	White	False	NULL	+39335412234
3	James	Taylor	No	j.taylor@gmail.com	+390114521

WEBSITE

Domain	**CustomerId**	**ExpirationDate**
abc.com	4	2024-01-19
lol.it	3	NULL
test.io	1	2023-04-12
ciao.it	1	2025-07-01

STATISTICS

Domain	**Date**	**#visitors**
test.io	2022-12-01	10
ciao.it	2022-12-01	45
test.io	2022-12-01	30
ciao.it	NULL	50
test.io	2022-12-02	30
test.io	2022-12-04	30

Exercise 4

The following relational tables are given (primary keys are underlined, optional attributes are indicated with "*"):

USER (UserID, Name, Surname, Email)
VIDEO (VideoID, Title, Description*, Duration, Category)
RATING (VideoID, UserID, Rating)

Use:

- The UserID attribute in the RATING table refers to the UserID attribute in the USER table
- The VideoID attribute in the RATING table refers to the VideoID attribute in the VIDEO table.
- The Rating attribute in the RATING table assumes integer values between 0 and 5.
- The Duration attribute of the VIDEO table takes only positive integer values.

Check if the following instances of the USER, VIDEO, and RATING tables are consistent with the above table schemas. Justify your answer.

USER

UserID	Name	Surname	Email
1	Maria	Verdi	maria.verdi@gmail.com
2	Piero	Neri	p.neri@gmail.com
3	Alice	Wonder	wonderworld@gmail.com
5	Luke	NULL	l.cielo@gmail.com

VIDEO

VideoID	Title	Description*	Duration	Category
1	Foo	Goofy on vacation	50	Fantasy
3	NULL	NULL	100	Yellow
5	Donald Duck	Donald Duck & Co.	238	Comic
9	Memory	NULL	-10	Romantic

RATING

VideoID	UserID	Rating
1	1	4
1	2	8
5	1	3
7	1	5
5	3	2
1	1	3