ifis

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Relational Databases I

Exercise Sheet 11: Application Programming I (until Thursday, 26.01.2017) (30 points)

Please note: you need **50%** of all exercise points to receive the *Studienleistung* for this lecture. In order to pass the RDB I Module, you need both the Studienleistung **and** you need to pass the exam. Exercises have to be turned in until **Thursday before the lecture** either in the lecture hall or into our mailbox at the IFIS floor (Mühlenpfordtstraße 23, 2nd floor). Please do not forget your **Matrikelnummer** and your **tutorial group number** on your solutions. **If you forget** to write your Matrikelnummer and/or your tutorial group number, you get **automatically 0 points**. Your solutions may be in German or English. Unless otherwise specified: **Always use your own words!**

Exercise 11.1 (12 points)

Answer the following questions

1) What problems may arise with updatable views? (2 points)
2) Briefly explain each property of the ACID principle. (4 points)
3) Why is the ACID principle needed in databases? (2 points)
4) When a View is updateable? (2 points)
5) Why do we need indexes in databases? (2 points)

Exercise 11.2 (15 points)

Consider the following SQL statements:

```
CREATE TABLE movie(
       id INT NOT NULL PRIMARY KEY,
       title VARCHAR(255) NOT NULL,
       year INT NOT NULL
)

CREATE TABLE actor(
        id INT NOT NULL PRIMARY KEY,
        name VARCHAR(255) NOT NULL,
        gender CHAR(1) CHECK (gender IN('m', 'f')),
        birthday VARCHAR(100) NOT NULL
)
```

1) Create a View called "classics" that contains all the movies between 1950s and 1960s. (2 points)
2) Create a View called "males" that contains only tuples of the table actor that are males. (2 points)
3) Consider the following view:

```
CREATE VIEW actors_born_in_january AS
SELECT * FROM actor WHERE birthday LIKE '%.01.%'
WITH CHECK OPTION
```

Suppose that there are no tuples in the actor table with id greater than 5. Is it possible to insert the following tuples in the view males_born_in_january? Explain why. (3 points)

i. (5, 'Brad', 'm', '19.01.1986')

ii. (6, 'Dakota', 'f', '21.01.1992')

iii. (7, 'Sophie', f, '12.01.1979')

4) Create an index on the attribute name of the actor table. (2 points)

5) Consider the following relation schema from previous exercises.

Movie(id, title, year)
Person(id, name, gender, birthday)
Genre(name, description)
actor(person → Person, movie → Movie, role)
director(person → Person, movie → Movie)
reviewer(person → Person, movie → Movie, stars)
hasGenre(movie → Movie, genre → Genre)

a) Write a SQL statement to find the name of all reviewers who have reviewed the movie "Rogue One". (2 points)

b) Provide SQL statements for creating all necessary indexes to speed up the SQL query from a). (4 points) **HINT**: remember that some attributes already have an index defined.

Exercise 11.3 (3 points)

Imagine you want to execute a transaction:

1) How do you suppress the behavior that every statement is executed separately in the first place? (1 point)

2) During the transaction you discover an exceptional state and you want to discard all operations you have done until now. How can you do that? (1 points)

3) If all operations have been executed successfully, how can you express that you want to save all changes persistently and close the transaction afterwards? (1 point)