



Seminar 6

Model for the Practical Test

Model for the Practical Test

PART I – on the WRITTEN EXAM only

Let M be a table in a SQL Server database with schema M[PK1, PK2, M1, M2, M3, M4, M5]. The primary key is {PK1, PK2}. Answer questions 1-3 using the legal instance below (each question has just one correct answer).

| | PK1 | PK2 | M1 | M2 | M3 | M4 | M5 |
|----|-----|-----|------------------|-------------------|----|------------|----|
| 1 | 11 | 1 | Marin Preda | Editura Didactica | 15 | 2000-12-01 | FB |
| 2 | 11 | 3 | Mihai Eminescu | Editura Didactica | 8 | 1890-04-06 | FB |
| 3 | 11 | 22 | Ion Agarbiceanu | Humanitas | 5 | 1990-01-01 | B |
| 4 | 12 | 1 | Marin Preda | Litera | 10 | 1900-04-09 | B |
| 5 | 12 | 3 | Mihai Eminescu | Carturesti | 6 | 2002-03-05 | S |
| 6 | 12 | 22 | Camil Petrescu | Carturesti | 1 | 1987-06-07 | B |
| 7 | 13 | 1 | Mircea Eliade | Litera | 20 | 2010-01-02 | S |
| 8 | 13 | 3 | Lucian Blaga | Litera | 15 | 2000-11-25 | FB |
| 9 | 13 | 22 | Mircea Cartrescu | Editura Didactica | 10 | 2000-03-14 | E |
| 10 | 14 | 1 | Lucian Blaga | Humanitas | 15 | 2000-12-01 | E |
| 11 | 14 | 3 | Dan Lungu | Polirom | 10 | 1890-04-06 | S |
| 12 | 14 | 22 | Mircea Eliade | Humanitas | 5 | 2002-03-05 | B |
| 13 | 14 | 44 | Dan Lungu | Polirom | 2 | 1990-01-01 | E |

Model for the Practical Test

PART I

1. Consider query Q below:

```
SELECT M2, SUM(M3) TotalM3, COUNT(M3) CountM3
FROM M
WHERE YEAR(M4) >= 2000 OR M1 LIKE '%escu%'
GROUP BY M2
HAVING SUM(M3) > 10
```

- a. Q returns 4 records and value Carturesti is in its result set.
- b. Q returns 4 records and value Litera is not in its result set.
- c. Q returns 3 records and value Carturesti is not in its result set.
- d. Q returns 2 records and values Carturesti and Litera are in its result set.

| | PK1 | PK2 | M1 | M2 | M3 | M4 | M5 |
|----|-----|-----|------------------|-------------------|----|------------|----|
| 1 | 11 | 1 | Marin Preda | Editura Didactica | 15 | 2000-12-01 | FB |
| 2 | 11 | 3 | Mihai Eminescu | Editura Didactica | 8 | 1890-04-06 | FB |
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| 4 | 12 | 1 | Marin Preda | Litera | 10 | 1900-04-09 | B |
| 5 | 12 | 3 | Mihai Eminescu | Carturesti | 6 | 2002-03-05 | S |
| 6 | 12 | 22 | Camil Petrescu | Carturesti | 1 | 1987-06-07 | B |
| 7 | 13 | 1 | Mircea Eliade | Litera | 20 | 2010-01-02 | S |
| 8 | 13 | 3 | Lucian Blaga | Litera | 15 | 2000-11-25 | FB |
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| 10 | 14 | 1 | Lucian Blaga | Humanitas | 15 | 2000-12-01 | E |
| 11 | 14 | 3 | Dan Lungu | Polirom | 10 | 1890-04-06 | S |
| 12 | 14 | 22 | Mircea Eliade | Humanitas | 5 | 2002-03-05 | B |
| 13 | 14 | 44 | Dan Lungu | Polirom | 2 | 1990-01-01 | E |

Model for the Practical Test

PART I

2. How many records does the following query return?

```
SELECT * FROM  
(SELECT PK1, PK2, M3 TotalM3 FROM M  
WHERE PK1 <= PK2) p1  
INNER JOIN (SELECT PK1, PK2, M5  
FROM M  
WHERE M5 LIKE '%B%') p2 ON p1.PK1 = p2.PK1 AND p1.PK2 = p2.PK2
```

- a. 2
- b. 4
- c. 3
- d. 1

| | PK1 | PK2 | M1 | M2 | M3 | M4 | M5 |
|----|-----|-----|------------------|-------------------|----|------------|----|
| 1 | 11 | 1 | Marin Preda | Editura Didactica | 15 | 2000-12-01 | FB |
| 2 | 11 | 3 | Mihai Eminescu | Editura Didactica | 8 | 1890-04-06 | FB |
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| 4 | 12 | 1 | Marin Preda | Litera | 10 | 1900-04-09 | B |
| 5 | 12 | 3 | Mihai Eminescu | Carturesti | 6 | 2002-03-05 | S |
| 6 | 12 | 22 | Camil Petrescu | Carturesti | 1 | 1987-06-07 | B |
| 7 | 13 | 1 | Mircea Eliade | Litera | 20 | 2010-01-02 | S |
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| 11 | 14 | 3 | Dan Lungu | Polirom | 10 | 1890-04-06 | S |
| 12 | 14 | 22 | Mircea Eliade | Humanitas | 5 | 2002-03-05 | B |
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Model for the Practical Test

PART I

3. Table M has a single trigger defined on it:

```
CREATE OR ALTER TRIGGER TrOnUpdate  
ON M  
FOR UPDATE AS
```

```
DECLARE @no INT = 0
```

```
SELECT @no = AVG(d.M3 - i.M3)
```

```
FROM deleted d INNER JOIN inserted i ON d.PK1 = i.PK1 AND d.PK2 = i.PK2 WHERE d.M3 > i.M3
```

```
PRINT @no
```

What's the value returned by the PRINT statement in the trigger when the UPDATE below is executed?

```
UPDATE M
```

```
SET M3 = 3
```

```
WHERE PK1 > PK2
```

- a. 5
- b. 9
- c. 15
- d. 11

| | PK1 | PK2 | M1 | M2 | M3 | M4 | M5 |
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| 11 | 14 | 3 | Dan Lungu | Polirom | 10 | 1890-04-06 | S |
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Model for the Practical Test

PART II – PRACTICAL TEST

Create a database to manage exam schedules from the faculties.

- a) The entities of interest to the problem domain are: Groups, Students, Courses and Professors.
- b) Each student has a name, a surname and a date of birthday and belongs to a group. A group has a number of students, a tutor name and a leader name.
- c) Each course has a name.
- d) Each professor has a name, a surname and a function.
- e) For every student and every course there is scheduled an exam, given by the date and the received mark.
- f) For each professor and each course there is the specialization and the number of credits.

- 1) Write an SQL script that creates the corresponding relational data model.
- 2) Implement a stored procedure that receives a student, a course, a date and a given mark and adds the corresponding exam. If the exam exists, the date and the given mark are updated.
- 3) Create a view that shows the groups in which the maximum mark was obtained.
- 4) Implement a function that lists the names of the professors that have taught at least M courses, where $M \geq 1$ is a function parameter.

Model for the Practical Test

Notation (Grade)

PART II – PRACTICAL TEST

- 1) – 4p
- 2) – 2p
- 3) – 1p
- 4) – 2p

The **Practical Test** will take **1h 15 minutes**.
(Laboratory 13 / Laboratory 14)

1p of