

Exercise Sheet No. 8 - Database

Energy Informatics

Winter 2016

Submission deadline: 10.02.2017, at 11:15 a.m.

Exercise 1: (3 pts)

Give the SQL-query that finds the city (city name) that has the maximum average of gas consumption. Its average of gas consumption should be part of the result as well.

Exercise 2: (2 pts)

For each of the following SQL-queries, indicate which of the tables E_i are the results when executing the respective query.

	<table><tr><th>A</th><th>B</th></tr><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr><tr><td>2</td><td>3</td></tr><tr><td>3</td><td>2</td></tr><tr><td>4</td><td>1</td></tr><tr><td>4</td><td>3</td></tr><tr><td>4</td><td>4</td></tr><tr><td>5</td><td>1</td></tr><tr><td>5</td><td>5</td></tr></table>	A	B	1	1	2	2	2	3	3	2	4	1	4	3	4	4	5	1	5	5		<table><tr><th>B</th></tr><tr><td>2</td></tr><tr><td>3</td></tr><tr><td>4</td></tr></table>	B	2	3	4		$E_1 :$	<table><tr><th>A</th></tr><tr><td>2</td></tr><tr><td>3</td></tr><tr><td>4</td></tr></table>	A	2	3	4		$E_2 :$	<table><tr><th>A</th></tr><tr><td>2</td></tr><tr><td>2</td></tr><tr><td>3</td></tr><tr><td>4</td></tr><tr><td>4</td></tr></table>	A	2	2	3	4	4		$E_3 :$	<table><tr><th>A</th></tr><tr><td>1</td></tr><tr><td>2</td></tr><tr><td>3</td></tr><tr><td>4</td></tr><tr><td>5</td></tr></table>	A	1	2	3	4	5
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- (1) SELECT A FROM R NATURAL JOIN S
- (2) SELECT A FROM R NATURAL JOIN S GROUP BY A
- (3) SELECT DISTINCT A FROM R LEFT OUTER JOIN S ON R.B = S.B
- (4) SELECT DISTINCT A FROM R RIGHT OUTER JOIN S ON R.B = S.B

Exercise 3: (3 pts)

Consider the following SQL query Q :

```
SELECT COUNT(*) AS NUM
FROM (
  SELECT * FROM T
  WHERE A NOT IN
    (SELECT B FROM T)
);
```

a) Consider the following instance t_1 from T:

<i>A</i>	<i>B</i>
1	2
2	<i>null</i>
4	4
3	1

Give the result of Q on t_1 . Justify your answer.

b) Consider now the following instance t_2 from T:

<i>A</i>	<i>B</i>
1	2
2	2
<i>null</i>	4
3	1

Give the result of Q on t_2 . Justify your answer.

Exercise 4: (2pts)

Explain why the following queries are wrong. Give, for each, the corresponding correct SQL-query.

a) List the names of all cities with the number of their buildings.

```
SELECT name, count(*) AS building_count
FROM citya natural JOIN building
GROUP BY cityid
ORDER BY building_count DESC;
```

b) The city with the maximum population along with its id.

```
SELECT MAX(population), cityid
FROM citya ;
```