

Quiz 2

Databases

4 March 2026

Full name:

You have 10 minutes to answer this quiz, directly on this sheet of paper. No electronic devices or material of any kind is allowed. Do not forget to add your name above. Every question amounts to 2 points; the quiz is graded out of 10 points.

Questions

Q1. Circle the correct answer.

In the relational algebra, the join operator:

- a. Can only be applied to relations with exactly the same schema.
- b. Always returns a relation with the same schema as its left operand.
- c. Can be expressed using renaming, cross product, selection, and projection.
- d. Is an elementary operator that cannot be expressed using other operators.

Q2. Consider the relational algebra expression (under set semantics):

$$\Pi_{\text{room}}(\sigma_{\text{guest}=2}(\text{Reservation}))$$

Explain what this query returns in English.
.....

Q3. Consider the SQL query:

```
SELECT *  
FROM Reservation  
WHERE arrival > '2026-01-12' AND guest = 2;
```

Write the corresponding relational algebra expression

.....

Q4. In SQL, what is the result of the following query:

```
SELECT *  
FROM Guest  
WHERE email = NULL;
```

- a. No tuple
- b. All tuples of the table
- c. All tuples where `email` is NULL
- d. A syntax error

Q5. Circle all valid relational algebra expressions in what follows (there may be zero or more than one), with respect to the schema `Guest(id, name, email)` and `Reservation(id, guest, room, arrival, nights)`.

- a. $\rho_{id \rightarrow guest}(Guest)$
- b. $\Pi_{email}(Reservation \bowtie_{guest=id} Guest)$
- c. $Guest \cup Reservation$
- d. $\Pi_{name, room}(Guest)$