Kurs
Datenbankgrundlagen und Modellierung

Sebastian Maneth, Universität Bremen

maneth@uni-bremen.de

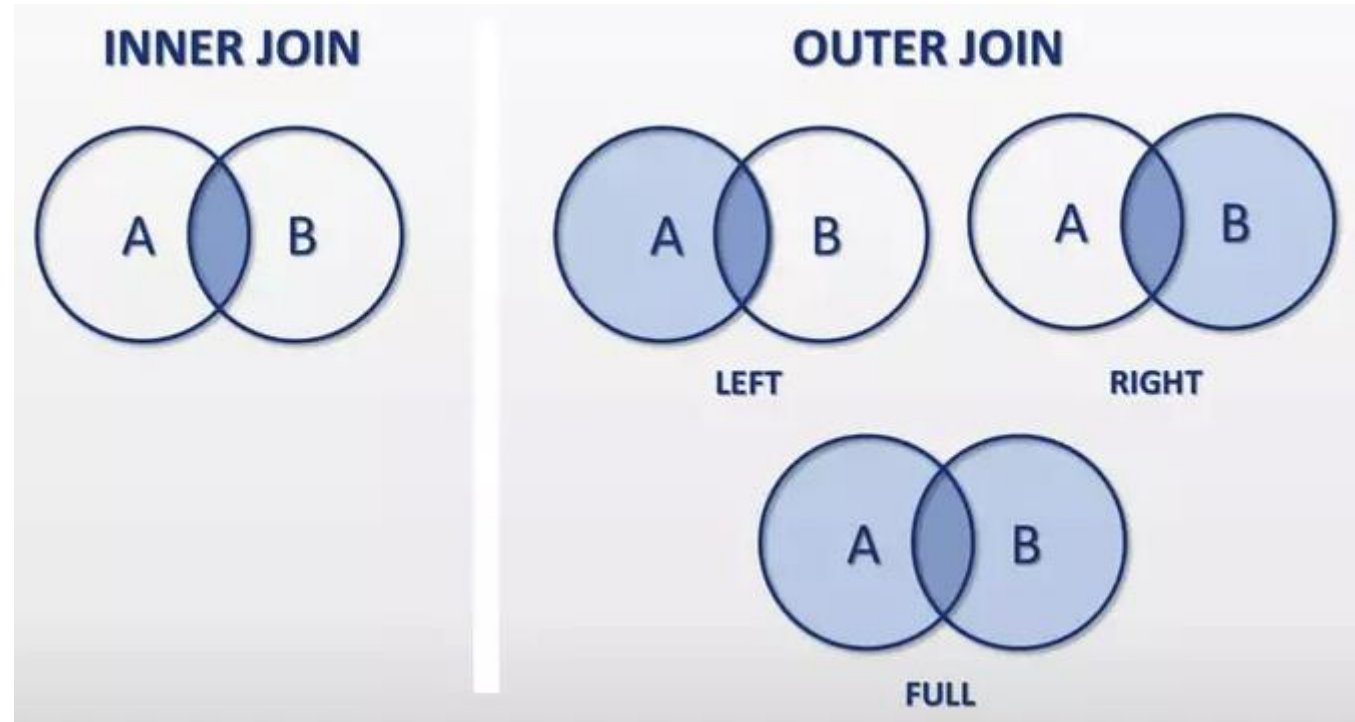SoSe 2023

17.05.2023

Tutorial 2: Database Decomposition
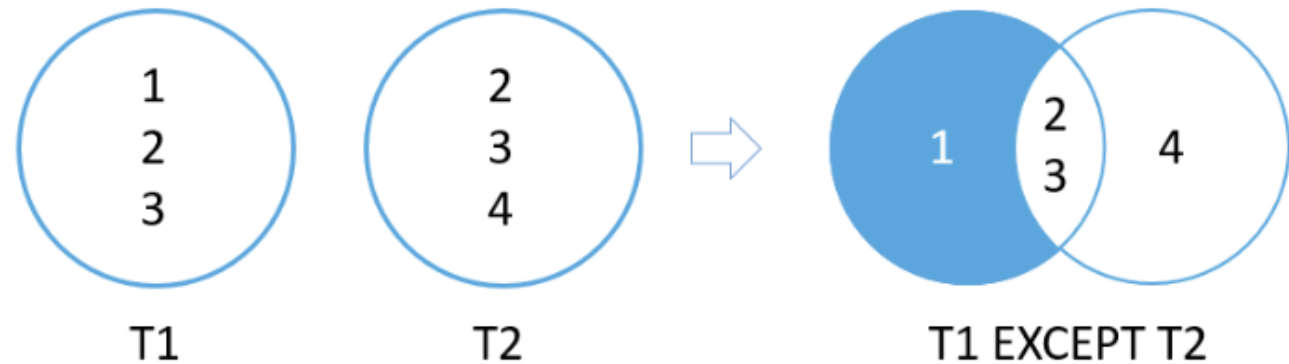
Tutor: Marcel Westenberg

Questions?

- OUTER JOIN
- NOT IN
- NOT EXISTS
- EXCEPT
  - EXCEPT ALL

INNER JOIN

OUTER JOIN

LEFT

RIGHT

FULL

https://www.ionos.de/digitalguide/hosting/hosting-technik/sql-outer-join/

1
2
3

T1

2
3
4

T2

1

2
3

4

T1 EXCEPT T2

https://www.sqlitetutorial.net/sqlite-except/

Database Decomposition:

1. Have a table, that has NULL-values (CREATE TABLE xy)
2. Find a way to separate the table into sub-tables without NULLS
3. Rename original table (ALTER TABLE xy RENAME TO xy_new)
4. Create the sub-tables (CREATE TABLE xy)
5. Fill each sub-table (INSERT INTO)
6. Check if everything worked (OUTER JOIN)
7. Prove it, idea: $A - B = 0 \land B - A = 0 \Rightarrow A = B$ (EXCEPT)
   if something goes wrong: (DELETE FROM table WHERE condition)
   or: (UPDATE table SET column_1 = new value_1, ... WHERE condition)

Using our knowledge:

- OUTER JOIN
  - not supportet by sqlite3
- (NOT) IN
  - Find every entry in names, that doesn't have a first name, that starts with ‚J'
- (NOT) EXISTS
  - Find every person, that has an entry in birthdays
- EXCEPT
  - Find every person, that has no entry in birthdays

Last weeks queries:

- Which movie made the most profit and when was it released?
- Who directed it?
- Which movie has the most directors and how many?
- How many movies have the same title?
- What are the
  - most popular actor names?
  - Top 10 Movies with the least/most actors?
  - Top 20 directors who made the most movies
  - Top 20 directors with the most awards?
  - Top 10 Actors that played in the most movies?

General Form of an SQL Query:

```
SELECT     list of attributes
FROM       list of tables
WHERE      condition over attributes
GROUP BY   list of attributes
HAVING     condition over aggregates
ORDER BY   list of attributes
LIMIT      number
```

aggregate functions:

```
COUNT      VARIANCE
SUM        STDDEV
AVG        BIT_OR
MAX        BIT_AND
MIN
```