Databases

Brief Summary

Relational databases

- Tables

title	director	year
12 Angry Men	Sidney Lumet	1957
Raiders of the Lost Ark	Steven Spielberg	1981
War of the Worlds	Steven Spielberg	2005
Manos: The Hands of Fate	Harold P. Warren	1966

- Modeling – ER diagram
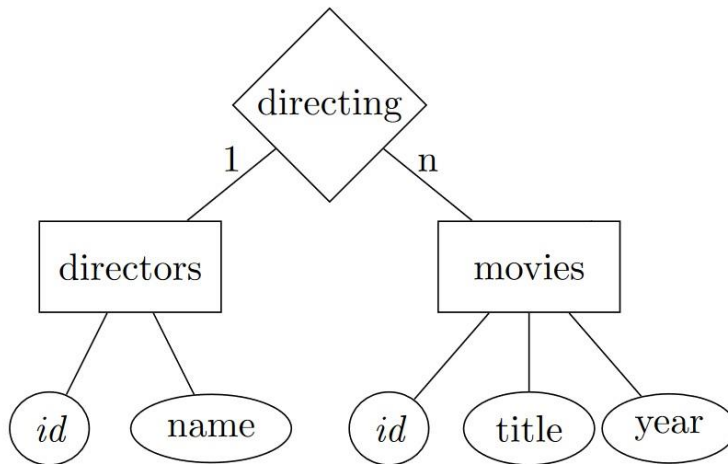
SQL Language

1. Creating databases

   - Data types for fields (eg. CHARACTER(m), INTEGER)

   - CREATE database, table

   - Enforce constraints (eg. UNIQUE, FOREIGN KEY)

SQL Language

2. Various operations

- SELECT fields or rows

- INSERT rows

- UPDATE rows

- DELETE rows

SQL Language

3. More complex queries

- Conditions (WHERE)

- Search for regexp (LIKE)

- Ordering results (ORDER BY)

- LIMIT number of results

- GROUP BY

- JOIN multiple tables

Many further challenges

- Indexing – fast access to records

  - Hash tables

  - B+ trees
    - Balanced ($\rightarrow$ has to be maintained after operations)
    - Entries in leaves

- Transactions

  - Atomic execution vs. Concurrency

  - SQL isolation levels

Verification cheatsheet for SQL exercises

- Exercise 3

    1. Starts with "*A Good Old...*"

    2. "*xXx*", "*tom thumb*"
        (note: because of case sensitivity)

    3. 6300

    4. 87

    5. 2524

    6. 100/0/59.051

    7. 1924, 1939, ...

    8. 12 movies, "*Xenia*" is the first

    9. 7 and 24

    10. 10 movies

- Exercise 5

    1. 11 rows

    2. 577

    3. 20 rows

    4. "*Clouds of...*" by 642

    5. 74.94/642/1

    6. 2 rows

    7. 9 rows