NIE-PDB: **Advanced Database Systems**

http://www.ksi.mff.cuni.cz/~svoboda/courses/221-NIE-PDB/

Practical Class 5

# Neo4j

**Martin Svoboda**
martin.svoboda@fit.cvut.cz

29. 11. 2022

**Charles University**, Faculty of Mathematics and Physics
**Czech Technical University in Prague**, Faculty of Information Technology

# Data Model

Database system structure

Instance ($\rightarrow$ **database**) $\rightarrow$ single **graph**

**Property graph** = directed labeled multigraph
- Collection of vertices (nodes) and edges (relationships)

**Node**
- Internal identifier
- Set of labels, set of properties

**Relationship**
- Internal identifier
- **Direction**, start and end node
- Exactly one type, set of properties

# First Steps

**Connect to our NoSQL server**

- SSH / PuTTY and SFTP / WinSCP
- **10.38.6.127:42222**

**Start Cypher shell and access our database**

- `cypher-shell -u login -p password`
  - Password option can be omitted, you will then be prompted

**Get familiar with basic commands**

- `:help`
- `:exit`

# Exercise 1

Express the following Cypher query
- **Find movies with identifier *medvidek***
- Return movie nodes together with title properties

# Exercise 2

Express the following Cypher query

- **Find actors born in *1965* or later**
- Return actor names and years they were born
- Sort the result using years (in descending order) and then names (in ascending order)

# Exercise 3

Express the following Cypher query
- **Find titles of movies in which *Jiri Machacek* played**

# Exercise 4

Express the following Cypher query
- **Find movies where at least one actor played**

# Exercise 5

Express the following Cypher query
- **Find actors who played with *Ivan Trojan***

# Exercise 6

Express the following Cypher query

- **Find all friends of actor *Ivan Trojan***
- Include friends of friends etc.
- Return actor names

# Exercise 7

Express the following Cypher query

- **Find pairs of movies and their actors**
- Include movies without actors as well

# Exercise 8

Express the following Cypher query

- **Find actors who played in movies having above average number of actors**
- Return actor names

# References

Embedded database and traversal framework

- https://neo4j.com/docs/java-reference/current/

JavaDoc

- https://neo4j.com/docs/java-reference/current/javadocs/

Cypher query language

- https://neo4j.com/docs/developer-manual/current/cypher/

Cypher reference card

- https://neo4j.com/docs/cypher-refcard/current/