MIE-PDB.16: **Advanced Database Systems**

http://www.ksi.mff.cuni.cz/~svoboda/courses/181-MIE-PDB/

Practical Class 6

Neo4j

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Data Model

Database system structure

> Instance → 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
- **nosql.ms.mff.cuni.cz:42222**

Start Neo4j shell and create your database

- `neo4j-shell --path directory`

Get familiar with basic commands

- `help`
- `exit`

Fill your database with sample data

- See `/home/NOSQL/FIT-MIE-PDB/neo4j/data.cypher`

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/