

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

<http://www.ksi.mff.cuni.cz/~svoboda/courses/201-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/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/>