NDBI040: PRACTICAL CLASS 6

NEO4J

(RECOMMENDED) REQUIREMENTS

▸ Database concepts

▸ macOS / Linux command line or PuTTy / WinSCP on Windows

SERVER ACCESS

CONNECT TO NOSQL SERVER

▸ ssh on macOS / Linux

▸ PuTTy on Windows

▸ nosql.ms.mff.cuni.cz:42222

▸ Login and password send by e-mail

▸ Change your initial password (if not yet changed) by passwd

TRANSFER FILES

▸ scp on macOS / Linux

▸ WinSCP on Windows

DATA MODEL

▸ 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

CYPHER: WRITE CLAUSES

▸ **CREATE** - creates new nodes or relationships

▸ **DELETE** - deletes nodes or relationships

▸ **SET** - updates labels or properties

▸ **REMOVE** - remove labels or properties

▸ ...

CYPHER: READ AND GENERAL CLAUSES

▸ `MATCH` - specified graph patterns to be searched for

  ▸ Either the whole pattern is matched, or nothing is matched

▸ `OPTIONAL MATCH` - attempts to find matching data, but when no solution is found, one specific solution with all the variables bound to NULL is generated

▸ `WITH` - allows query parts to be chained together

▸ `WHERE` - adds additional filtering constraints

▸ `RETURN` - defines what the query result should contain

▸ `ORDER BY` - describes how the query result should be ordered

▸ `SKIP` - excludes certain number of solutions from the result

▸ `LIMIT` - limits the number of solutions to be included

▸ ...

CYPHER: EXPRESSIONS

LITERAL EXPRESSIONS

‣ Integers: decimal, octal, hexadecimal

‣ Floating-point numbers

‣ Strings

    ‣ Enclosed in double or single quotes

    ‣ Standard escape sequences

‣ Boolean values: true, false

‣ NULL value (cannot be stored in data graphs)

OTHER EXPRESSIONS

    ‣ Collections, variables, property accessors, function calls, path patterns, boolean expressions, arithmetic expressions, comparisons, regular expressions, predicates, ...

‣ SIZE(...), EXISTS(...), COUNT(...), AVG(...), DESC / DESCENDING, ASC / ASCENDING, DISTINCT, AS, ...

NEO4J: FIRST STEPS

START NEO4J SHELL AND CREATE YOUR DATABASE
▸ neo4j-shell --path directory

BASIC COMMANDS
▸ help

▸ exit

FILL YOUR DATABASE WITH SAMPLE DATA
▸ See /home/NOSQL/neo4j/data.cypher

EXERCISE 1

▸ Find movies with identifier medvidek

▸ Return movie nodes together with title properties

EXERCISE 2

▸ 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

▸ Find titles of movies in which Jiri Machacek played

EXERCISE 4

▸ Find movies where at least one actor played

EXERCISE 5

▸ Find actors who played with Ivan Trojan

EXERCISE 6

▸ Find all friends of actor Ivan Trojan

▸ Include friends of friends etc.

▸ Return actor names

EXERCISE 7

▸ Find pairs of movies and their actors

▸ Include movies without actors as well

EXERCISE 8

▸ 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/cypher-manual/current/

▸ Cypher reference card

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