Graph Database Topics.

Assignments – Neo4j

You will be querying three Neo4j databases, provided to you together with the software. These databases are: (1) A graph representation of the Northwind operational database, denoted northwindhg.db; (2) A database containing information about movies, denoted movies.db; (3) A database containing historical information about the world cups, from the start through the 2014 world cup, denoted worldcup.db.

Once you login to your account (in Linux), you need to go to the /tmp folder. Once there, open a terminal and type the following commands:

cd /tmp
tar xJf /serveur/neo4j.tar.xz
cd neo4j

At this point, you are about to start the Neo4j server. First, you need to choose the database you will work with. For this, you go to the conf folder, and edit the neo4j.conf file. You will find something like this:

```ini
#dbms.active_database=graph.db
#dbms.active_database=trajectories-NYC-4sq.db
#dbms.active_database=trajectories.db
#dbms.active_database=worldcup.db
#dbms.active_database=web.db
#dbms.active_database=telco.db
dbms.active_database=northwindhg.db
#dbms.active_database=movies.db
#dbms.active_database=calls.db
```

Since dbms.active_database=northwindhg.db is unmarked, when you start the server, you will also load the northwindhg.db database. To change it to the movies.db, you mark dbms.active_database=northwindhg.db, and unmark dbms.active_database=movies.db. Save the changes, and quit the file. Then you run: . /bin/neo4j console

And the server starts. Then, open a browser, and type the following url:
localhost:7474.
Now you can start writing Cypher queries.
Assignment 1.

Consider the Northwind database, whose schema is:

This database has been exported to Neo4j, and you can find it at: /……/data/databases/northwindhg.db. The graph schema is:
Write in Cypher the following queries over the northwindhg.db database:

1 - List products and their unit price.

2 - List information about products 'Chocolade' & 'Pavlova'.

3 - List information about products with names starting with a "C", whose unit price is greater than 50.

4 - Same as 3, but considering the sales price, not the product’s price.

5 - Total amount purchased by customer and product.

6 - Top 10 employees, considering the number of orders sold.

7 - For each employee, list the assigned territories.

8 - For each city, list the companies settled in that city.

9 - How many persons an employee reports to, either directly or transitively?

10 - To whom do persons called “Robert” report to?

11 - Who does not report to anybody?

12 - Suppliers, number of categories they supply, and a list of such categories

13 - Suppliers who supply beverages

14 - Customer who purchases the largest amount of beverages

15 - List the 5 most popular products (considering number of orders)

16 - Products ordered by customers from the same country than their suppliers
Assignment 2.

Switch to the movies.db database. For this, stop the server, using the ctrl-c command in the terminal. Then, edit the neo4j.conf as explained, and unmark the movies.db line. Then, star the server again. When you open the browser and type the url localhost:7474, you’ll have the neo4j database available. The schema is (you can get this writing call db.schema at the prompt):

Write in Cypher the following queries over the movies.db database:

1 - Actors who played in two movies directed by the same director. Return the actor, the films, and the director.

2 - Actors who played in the same film with Kevin Bacon.

3 - Actors who played in a movie directed by Robert De Niro.

4 - For each actor, list the number of actors she played with in a movie.

5 - Actors who played in a movie with Samuel L. Jackson.

6 - Shortest path between Robert De Niro and Kevin Bacon.

7 - Shortest path between Kevin Bacon and Stephen Lang.

8 - Shortest path between Kevin Bacon and any other actor.
Assignment 3.

Switch to the worldcup.db database, doing the same steps as in Assignment 2. Now, the database is worldcup.db. The schema is:

Write in Cypher the following queries over the worldcup.db database:

1 - Who hosted the world cup?

2 - Who hosted the World Cup more than once, and when.

3 - Hosts that won the World Cup, and the result of the final match.

4 - Top scorers per world cup.

5 - Top scorer playing in the 2018 World Cup.

6 - Which hosts won the World Cup that they hosted?

7 - Which countries have never won a match at a World Cup?

8 - What's the highest number of goals scored in a World Cup match?

9 - Which stadium has hosted the most World Cup matches?

10- Which country has scored the most goals across all World Cups?

11 - Which country has participated in the most World Cups?
12 - Which hosts won the World Cup that they hosted?

13 - Which countries have never won a match at a World Cup?

14 - What's the highest number of goals scored in a World Cup match?

15 - Which stadium has hosted the most World Cup matches?

16 - Which country has scored the most goals across all World Cups?

17 - Which country has participated in the most World Cups?