

Assignment 2

CSCI E 63 – Big Data Analytics

Problem 1:

The following is the content of Movies database. Bring that database into Neo4J using curl.

```
CREATE (matrix1:Movie { title : 'The Matrix', year : '1999-03-31' }) return id(matrix1)

CREATE (matrix2:Movie { title : 'The Matrix Reloaded', year : '2003-05-07' }) return id(matrix2)

CREATE (matrix3:Movie { title : 'The Matrix Revolutions', year : '2003-10-27' }) return id(matrix3)

CREATE (keanu:Actor { name:'Keanu Reeves' }) return id(keanu)

CREATE (laurence:Actor { name:'Laurence Fishburne' })

CREATE (carrieanne:Actor { name:'Carrie-Anne Moss' })

CREATE (keanu)-[:ACTS_IN { role : 'Neo' }]->(matrix1)

CREATE (keanu)-[:ACTS_IN { role : 'Neo' }]->(matrix2)

CREATE (keanu)-[:ACTS_IN { role : 'Neo' }]->(matrix3)

CREATE (laurence)-[:ACTS_IN { role : 'Morpheus' }]->(matrix1)

CREATE (laurence)-[:ACTS_IN { role : 'Morpheus' }]->(matrix2)

CREATE (laurence)-[:ACTS_IN { role : 'Morpheus' }]->(matrix3)

CREATE (carrieanne)-[:ACTS_IN { role : 'Trinity' }]->(matrix1)

CREATE (carrieanne)-[:ACTS_IN { role : 'Trinity' }]->(matrix2)

CREATE (carrieanne)-[:ACTS_IN { role : 'Trinity' }]->(matrix3)
```

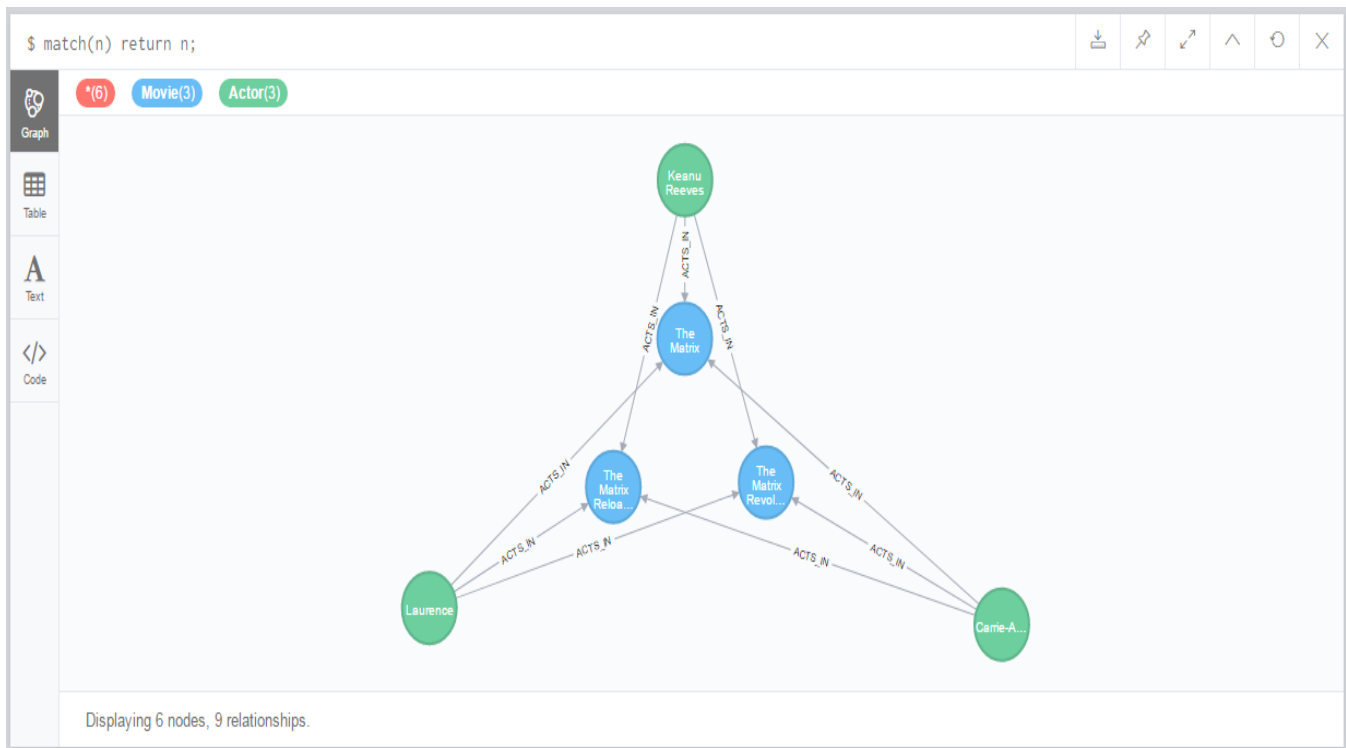
You might want to create a bash script which contains curl command with previous Cypher request and run that script from Cygwin or Linux (Unix) prompt. Following notes could be helpful:

- 1) you might want to use notepad++ to create and edit the bash file, and go to edit --> EOL conversion --> Unix.
- 2) Specify the user name and password like "-user neo4j:neo4jneo4j" before the local host url.
- 3) Add one space and one \ at each point you want to have a line break.
- 4) In the string of query, every double quote " should be changed to \".

Assignment 2

CSCI E 63 – Big Data Analytics

Answer:



Solution:

For this problem, I've used a bash script that contains a curl command. The curl command in turn uses a JSON file with create commands in Cypher Query Language (CQL).

➔ Files used:

```
λ ls -ltr
total 5
-rwxr-xr-x 1 KBHANDARKAR 1049089 185 Sep 12 17:41 curlMovieScript.bash*
-rw-r--r-- 1 KBHANDARKAR 1049089 976 Sep 12 18:48 movieImport.json
```

➔ Bash Script (curlMovieScript.bash):

```
#!/bin/sh
```

```
curl -i -H accept:application/json -H content-type:application/json --user neo4j:M@nchesterUn7ted -XPOST http://localhost:7474/db/data/transaction/commit -d @movieImport.json
```

Assignment 2

CSCI E 63 – Big Data Analytics

➔ JSON File (movieImport.json):

```
{
  "statements": [
    {
      "statement": "CREATE (matrix1:Movie { title : 'The Matrix', year : '1999-03-31' }) CREATE
(matrix2:Movie { title : 'The Matrix Reloaded', year : '2003-05-07' }) CREATE (matrix3:Movie { title : 'The
Matrix Revolutions', year : '2003-10-27' }) CREATE (keanu:Actor { name:'Keanu Reeves' }) CREATE
(laurence:Actor { name:'Laurence Fishburne' }) CREATE (carrieanne:Actor { name:'Carrie-Anne Moss' })
CREATE (keanu)-[:ACTS_IN { role : 'Neo' }]->(matrix1) CREATE (keanu)-[:ACTS_IN { role : 'Neo' }]-
>(matrix2) CREATE (keanu)-[:ACTS_IN { role : 'Neo' }]->(matrix3) CREATE (laurence)-[:ACTS_IN { role :
'Morpheus' }]->(matrix1) CREATE (laurence)-[:ACTS_IN { role : 'Morpheus' }]->(matrix2) CREATE
(laurence)-[:ACTS_IN { role : 'Morpheus' }]->(matrix3) CREATE (carrieanne)-[:ACTS_IN { role : 'Trinity' }]-
>(matrix1) CREATE (carrieanne)-[:ACTS_IN { role : 'Trinity' }]->(matrix2) CREATE (carrieanne)-[:ACTS_IN
{ role : 'Trinity' }]->(matrix3)"
    }
  ]
}
```

➔ Changes made to provided statements:

The create statements need to be run as a batch command in the same session in order to use the IDs created for relationship mapping. For this purpose, return statements need to be removed. An alternative could have been to use the IDs created in subsequent queries.

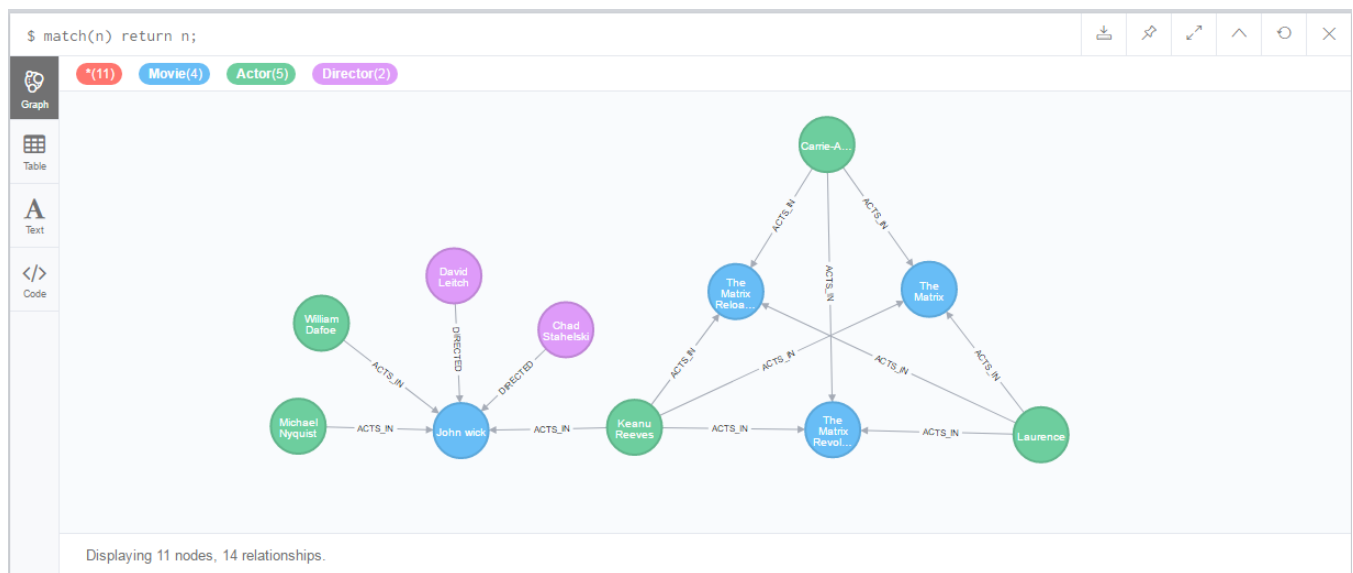
Assignment 2

CSCI E 63 – Big Data Analytics

Problem 2:

Keanu Reeves acted in the movie “John Wick” which is not in the database. That movie was directed by Chad Stahelski and David Leitch. Cast of the movie included William Dafoe and Michael Nyquist. Demonstrate that you have successfully brought data about John Wick movie into the database. You can use Cypher Browser or any other means. Delete above movie and all the cast except Keanu Reeves.

Answer:



→ CQL

```
MATCH(keanu:Actor{name:'Keanu Reeves'})
CREATE (johnwick:Movie { title : 'John wick'})
CREATE (:Director { name:'David Leitch' })-[:DIRECTED]-> (johnwick)
CREATE (:Director { name:'Chad Stahelski' })-[:DIRECTED]->(johnwick)
CREATE (keanu)-[:ACTS_IN{role:'John Wick'}]->(johnwick)
CREATE (:Actor { name:'William Dafoe' })-[:ACTS_IN {role:'Marcus'} ]->(johnwick)
CREATE (:Actor { name:'Michael Nyquist' })-[:ACTS_IN {role:'Viggo Tarasov'}]->(johnwick)
```

→ OUTPUT

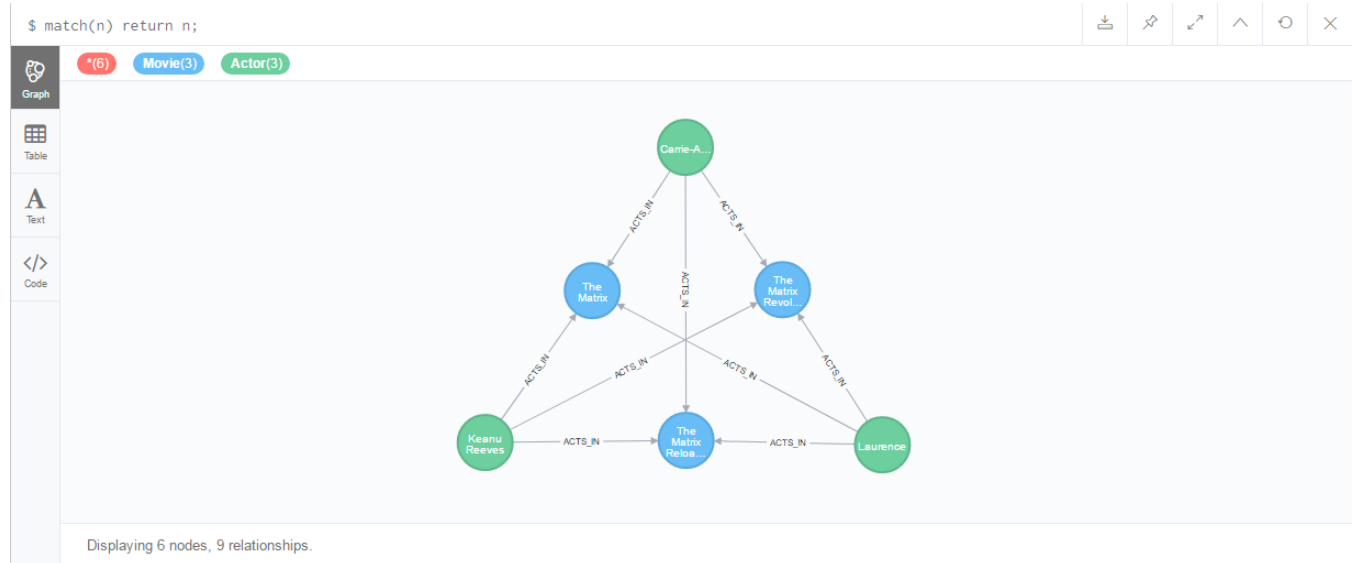
```
$ MATCH(keanu:Actor{name:'Keanu Reeves'}) CREATE (johnwick:Movie { title : 'John wick'}) CREATE (:Director { name:'David Leitch' })-[:DIRECTED]-> (johnwick) CREATE (:Director { name:'Chad Stahelski' })-[:DIRECTED]->(johnwick) CREATE (keanu)-[:ACTS_IN{role:'John Wick'}]->(johnwick) CREATE (:Actor { name:'William Dafoe' })-[:ACTS_IN {role:'Marcus'} ]->(johnwick) CREATE (:Actor { name:'Michael Nyquist' })-[:ACTS_IN {role:'Viggo Tarasov'}]->(johnwick)
```

Added 5 labels, created 5 nodes, set 7 properties, created 5 relationships, completed after 41 ms.

Assignment 2

CSCI E 63 – Big Data Analytics

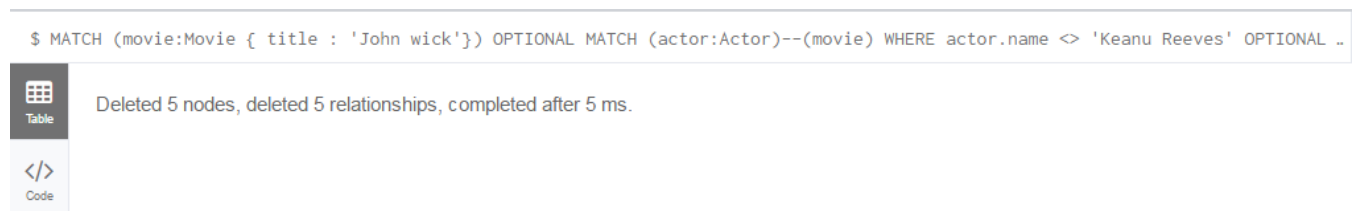
Answer:



→ CQL

```
MATCH (movie:Movie { title : 'John wick'})  
OPTIONAL MATCH (actor:Actor)--(movie) WHERE actor.name <> 'Keanu Reeves'  
OPTIONAL MATCH (director:Director)--(movie)  
DETACH DELETE actor, director, movie
```

→ OUTPUT



Assignment 2

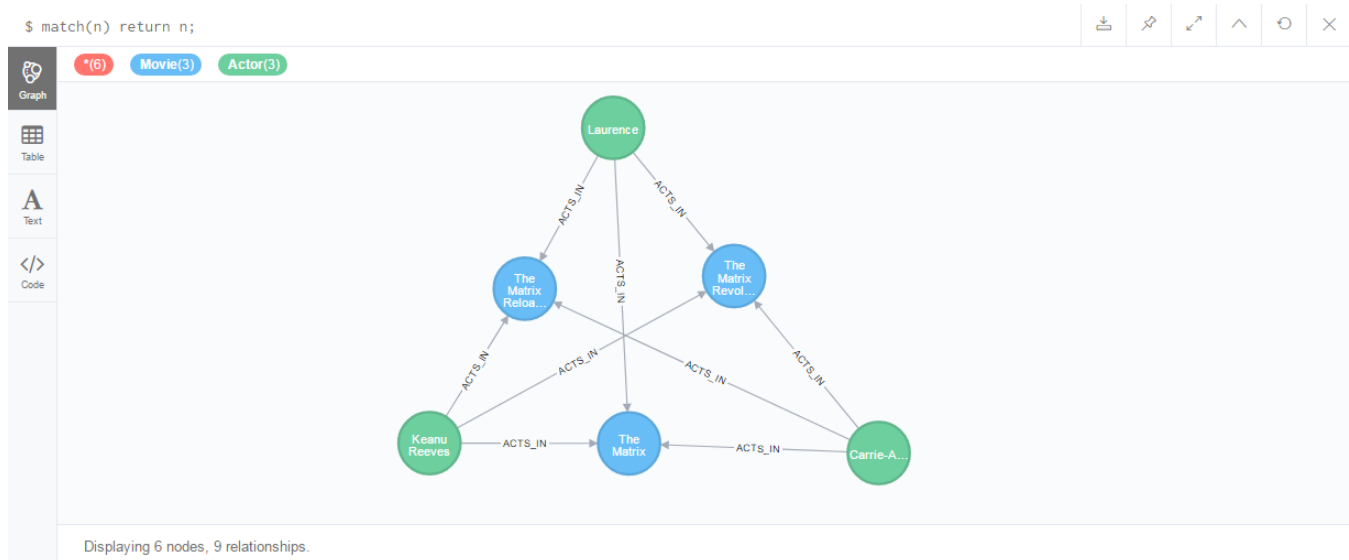
CSCI E 63 – Big Data Analytics

Problem 3:

Add all the actors and the roles they played in this movie “John Wick” to the database using JAVA REST API or some other APIs for Neo4J in a language of your choice (not Curl). Demonstrate that you have successfully brought data about John Wick movie into the database. You can use Cypher Browser or any other means.

Answer:

➔ Pre-execution Database State:



➔ Add all the actors and the roles they played in this movie “John Wick” to the database using JAVA REST API:

The standalone Neo4j Server can be installed on any machine and then accessed via its binary Bolt protocol through the official Neo4j Java driver.

Add dependency in pom as (pom.xml file submitted):

```
<dependency>
  <groupId>org.neo4j.driver</groupId>
  <artifactId>neo4j-java-driver</artifactId>
  <version>1.0.3</version>
</dependency>
```

Setup validation response string as:

```
String responseString = " MATCH (actor:Actor)-[r:ACTS_IN]->(movie:Movie { title : 'John Wick'}) " + "return movie.title as Movie, actor.name as Actor, r.role as Role " ;
```

Assignment 2

CSCI E 63 – Big Data Analytics

Setup query string as:

```
String queryString = "MATCH(keanu:Actor{name:'Keanu Reeves'}) "+
"CREATE (johnwick:Movie { title : 'John Wick'}) " +
"CREATE (keanu)-[:ACTS_IN { role : 'John Wick' }]->(johnwick) "+
"CREATE (:Actor { name:'Michael Nyqvist' })-[:ACTS_IN { role : 'Viggo Tarasov' }]->(johnwick) " +
"CREATE (:Actor { name:'Alfie Allen' })-[:ACTS_IN { role : 'Iosef Tarasov' }]->(johnwick) ";
```

Code Snippet (Class file submitted):

```
driver = GraphDatabase.driver( "bolt://localhost", AuthTokens.basic( "neo4j","*" ));
session = driver.session();

session.run(queryString);
StatementResult result = session.run(responseString);

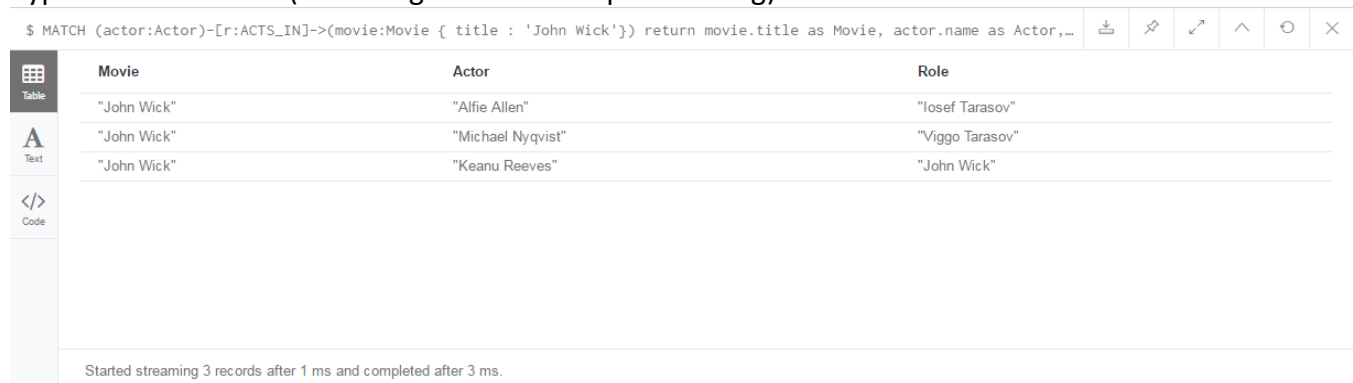
while (result.hasNext()) {
    Record record = result.next();
    System.out.println( "Attached actor "+record.get( "Actor" ).asString() + " to
movie " + record.get("Movie").asString() + " as "+
record.get("Role").asString());
}
```

Console Output:



```
<terminated> Main [Java Application] C:\Program Files\Java\jre1.8.0_144\bin\javaw.exe (Sep 13, 2017, 5:32:32 PM)
Attached actor Alfie Allen to movie John Wick as Iosef Tarasov
Attached actor Michael Nyqvist to movie John Wick as Viggo Tarasov
Attached actor Keanu Reeves to movie John Wick as John Wick
```

Cypher Confirmation (executing validation response string):



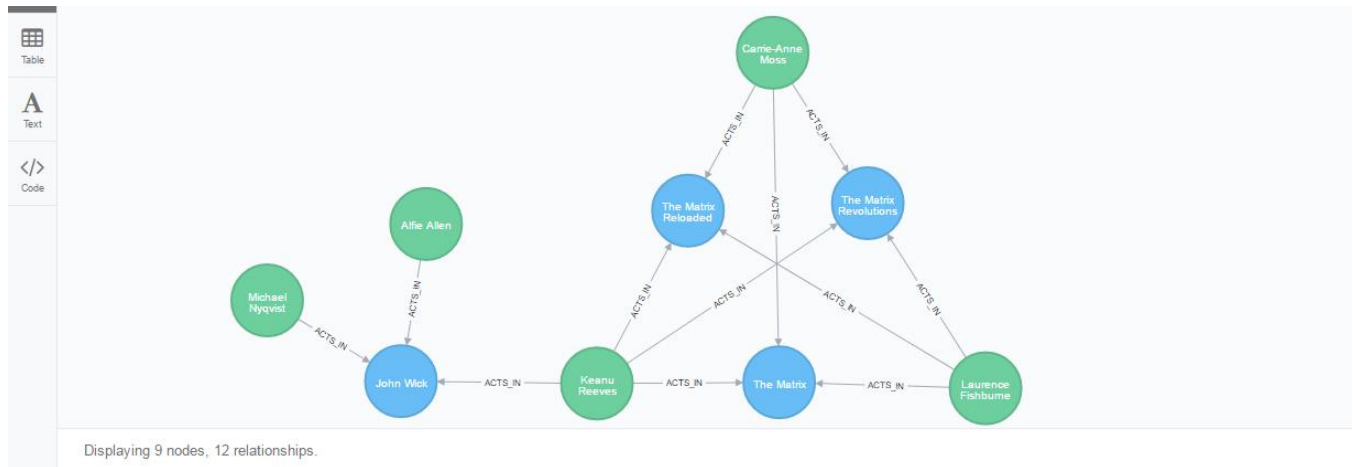
Movie	Actor	Role
"John Wick"	"Alfie Allen"	"Iosef Tarasov"
"John Wick"	"Michael Nyqvist"	"Viggo Tarasov"
"John Wick"	"Keanu Reeves"	"John Wick"

Started streaming 3 records after 1 ms and completed after 3 ms.

Assignment 2

CSCI E 63 – Big Data Analytics

➔ Post-execution Database State:



Assignment 2

CSCI E 63 – Big Data Analytics

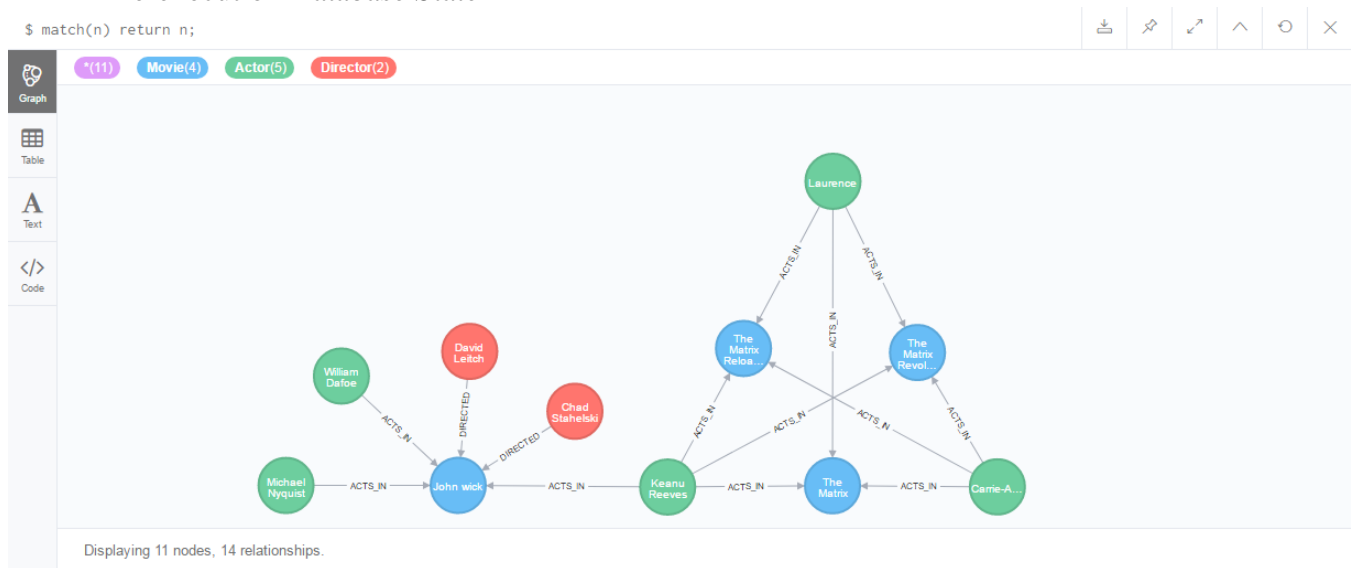
Problem 4:

Find a list of actors playing in movies in which Keanu Reeves played. Find directors of movies in which K. Reeves played. Please use any language of your convenience (Java, Python, C#, R, curl). Verify your results using Cypher queries in Cypher Browser

Answer:

I have used Problem 2 database state as a starting point for this problem.

➔ Pre-execution Database State



➔ Find a list of actors playing in movies in which Keanu Reeves played. Find directors of movies in which K. Reeves played.

The standalone Neo4j Server can be installed on any machine and then accessed via its binary Bolt protocol through the official Neo4j Java driver.

Add dependency in pom as (pom.xml file submitted):

```
<dependency>
  <groupId>org.neo4j.driver</groupId>
  <artifactId>neo4j-java-driver</artifactId>
  <version>1.0.3</version>
</dependency>
```

Assignment 2

CSCI E 63 – Big Data Analytics

Set up celebrity query string as:

```
String celebrityQueryString = "MATCH (keanu:Actor{name:\"Keanu Reeves\"}) " +
    "MATCH (keanu)-[:ACTS_IN]->(keanuMovies) " +
    "MATCH (keanuMovieActor)-[r:ACTS_IN]->(keanuMovies) WHERE keanuMovieActor.name <>
    keanu.name " +
    "RETURN distinct keanuMovieActor.name AS Celebrity, 'Actor' as Contribution, r.role as
    Role " +
    "UNION " +
    "MATCH (keanuMovieDirector)-[r:DIRECTED]->(keanuMovies) " +
    "RETURN distinct keanuMovieDirector.name AS Celebrity, 'Director' as Contribution,
    null as Role";
```

Set up complete relation query string as:

```
String completeRelationQueryString = "MATCH (keanu:Actor{name:\"Keanu Reeves\"}) " +
    "MATCH (keanu)-[:ACTS_IN]->(keanuMovies) " +
    "MATCH (keanuMovieCelebs)-[r]->(keanuMovies) WHERE keanuMovieCelebs.name <>
    keanu.name " +
    "RETURN distinct keanuMovieCelebs.name AS CelebName, r.role AS RoleName,
    keanuMovies.title AS MovieName";
```

Code Snippet (Class file submitted):

```
Driver driver = null;
Session session = null;
try {
    driver = GraphDatabase.driver( "bolt://localhost", AuthTokens.basic( "neo4j",
        "*" ));
    session = driver.session();

    System.out.println("List of actors that played in movies and directors that
    directed movies starring Keanu Reeves:");

    StatementResult celebrity = session.run(celebrityQueryString);

    while (celebrity.hasNext())
    {
        Record celebRecord = celebrity.next();
        StringBuilder sb1 = new StringBuilder();
        if((celebRecord.get("Contribution").asString()).equalsIgnoreCase("Actor")){
            sb1.append(celebRecord.get("Celebrity") + " acted in a movie with Keanu
            Reeves");
        } else {
            sb1.append(celebRecord.get("Celebrity") + " directed a movie starring
            Keanu Reeves");
        }
        System.out.println(sb1.toString());
    }
}
```

Assignment 2

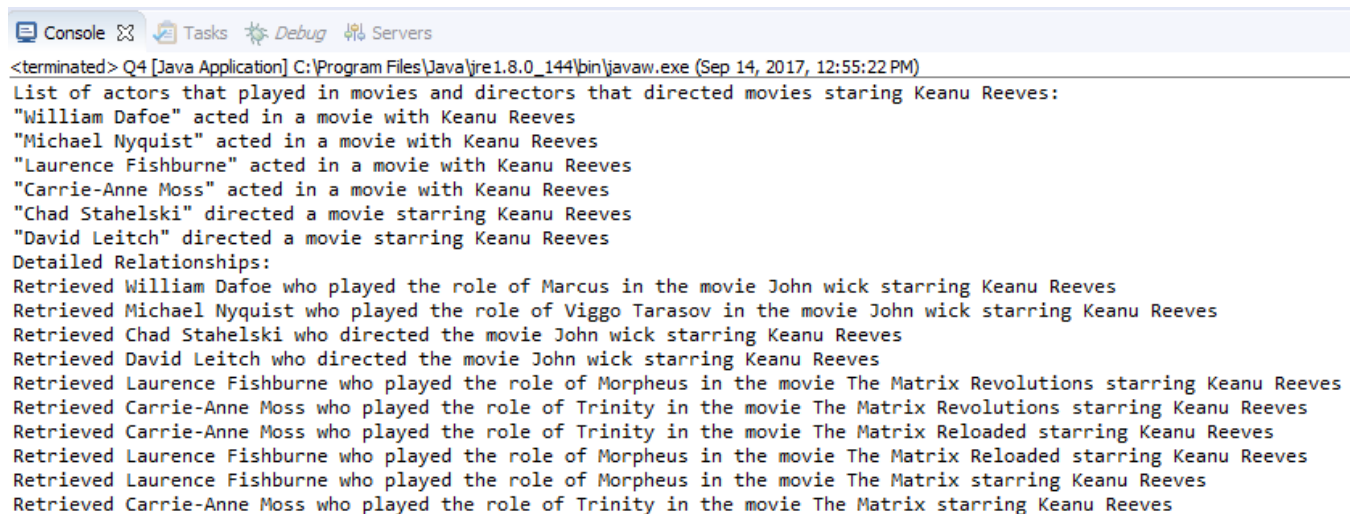
CSCI E 63 – Big Data Analytics

```
System.out.println("Detailed Relationships: ");

StatementResult completeRelation = session.run(completeRelationQueryString);

while (completeRelation.hasNext())
{
    Record record = completeRelation.next();
    StringBuilder sb = new StringBuilder();
    sb.append("Retrieved "+record.get( "CelebName" ).asString()+" who ");
    if(!(record.get( "RoleName" ).asString()).equalsIgnoreCase("null")) {
        sb.append("played the role of " + record.get( "RoleName" ).asString() +
            " in ");
    } else {
        sb.append("directed ");
    }
    sb.append("the movie " + record.get( "MovieName" ).asString() + " starring
Keanu Reeves");
    System.out.println(sb.toString());
}
```

Console Output:



```
<terminated> Q4 [Java Application] C:\Program Files\Java\jre1.8.0_144\bin\javaw.exe (Sep 14, 2017, 12:55:22 PM)
List of actors that played in movies and directors that directed movies starring Keanu Reeves:
"William Dafoe" acted in a movie with Keanu Reeves
"Michael Nyquist" acted in a movie with Keanu Reeves
"Laurence Fishburne" acted in a movie with Keanu Reeves
"Carrie-Anne Moss" acted in a movie with Keanu Reeves
"Chad Stahelski" directed a movie starring Keanu Reeves
"David Leitch" directed a movie starring Keanu Reeves
Detailed Relationships:
Retrieved William Dafoe who played the role of Marcus in the movie John wick starring Keanu Reeves
Retrieved Michael Nyquist who played the role of Viggo Tarasov in the movie John wick starring Keanu Reeves
Retrieved Chad Stahelski who directed the movie John wick starring Keanu Reeves
Retrieved David Leitch who directed the movie John wick starring Keanu Reeves
Retrieved Laurence Fishburne who played the role of Morpheus in the movie The Matrix Revolutions starring Keanu Reeves
Retrieved Carrie-Anne Moss who played the role of Trinity in the movie The Matrix Revolutions starring Keanu Reeves
Retrieved Carrie-Anne Moss who played the role of Trinity in the movie The Matrix Reloaded starring Keanu Reeves
Retrieved Laurence Fishburne who played the role of Morpheus in the movie The Matrix Reloaded starring Keanu Reeves
Retrieved Laurence Fishburne who played the role of Morpheus in the movie The Matrix starring Keanu Reeves
Retrieved Carrie-Anne Moss who played the role of Trinity in the movie The Matrix starring Keanu Reeves
```

➔ Cypher Confirmation from Cypher Browser

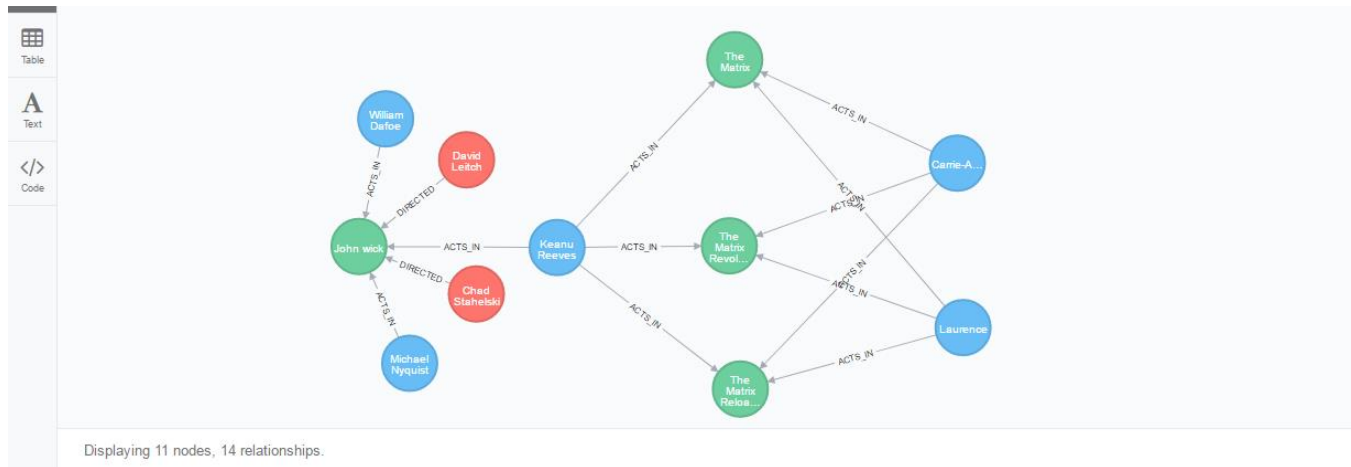
CQL:

```
MATCH (keanu:Actor{name:"Keanu Reeves"})
MATCH (keanu)-[:ACTS_IN]->(keanuMovies)
MATCH (keanuMovieCelebs)-[]->(keanuMovies)
return keanuMovieCelebs, keanuMovies
```

Assignment 2

CSCI E 63 – Big Data Analytics

Cypher Browser Output:



Assignment 2

CSCI E 63 – Big Data Analytics

Problem 5:

Find a way to export data from Neo4j into a set of CSV files. Delete your database and demonstrate that you can recreate the database by loading those CSV files. Please use any programming language of your convenience: Java, Python, R, C# or Scala.

Answer:

Setup CQL Queries For Data Export(Actor.csv and Director.csv files submitted):

```
private static final String actorExportQueryString = "CALL
apoc.export.csv.query(\"MATCH (p:Actor)-[r]->(m:Movie) return p.name as name,\"
+ \" type(r) as type, r.role as role, m.title as title,\"
+ \" m.year as year\", \"C:/Users/kbandarkar/Actor.csv\", {})\";
private static final String directorExportQueryString = "CALL
apoc.export.csv.query(\"MATCH (p:Director)-[r]->(m:Movie) return p.name as name,\"
+ \" type(r) as type, m.title as title, m.year as year\", \"
+ \" \"C:/Users/kbandarkar/Director.csv\", {})\";
```

\$ MATCH (p:Actor)-[r]->(m:Movie) return p.name as name, type(r) as type, r.role as role, m.title as title, m.year as year										
	name	type	role	title	year					
	"Laurence Fishburne"	"ACTS_IN"	"Morpheus"	"The Matrix"	"1999-03-31"					
	"Keanu Reeves"	"ACTS_IN"	"Neo"	"The Matrix"	"1999-03-31"					
	"Carrie-Anne Moss"	"ACTS_IN"	"Trinity"	"The Matrix"	"1999-03-31"					
	"Laurence Fishburne"	"ACTS_IN"	"Morpheus"	"The Matrix Reloaded"	"2003-05-07"					
	"Keanu Reeves"	"ACTS_IN"	"Neo"	"The Matrix Reloaded"	"2003-05-07"					
	"Carrie-Anne Moss"	"ACTS_IN"	"Trinity"	"The Matrix Reloaded"	"2003-05-07"					
	"Keanu Reeves"	"ACTS_IN"	"Neo"	"The Matrix Revolutions"	"2003-10-27"					
	"Carrie-Anne Moss"	"ACTS_IN"	"Trinity"	"The Matrix Revolutions"	"2003-10-27"					
	"Laurence Fishburne"	"ACTS_IN"	"Morpheus"	"The Matrix Revolutions"	"2003-10-27"					
	"Michael Nyquist"	"ACTS_IN"	"Viggo Tarasov"	"John wick"	(empty)					
	"William Dafoe"	"ACTS_IN"	"Marcus"	"John wick"	(empty)					
	"Keanu Reeves"	"ACTS_IN"	"John Wick"	"John wick"	(empty)					
Started streaming 12 records after 8 ms and completed after 10 ms.										

\$ MATCH (p:Director)-[r]->(m:Movie) return p.name as name, type(r) as type, r.role as role, m.title as title, m.year as y...

Table

Text

Code

name	type	role	title	year
"David Leitch"	"DIRECTED"	(empty)	"John wick"	(empty)
"Chad Stahelski"	"DIRECTED"	(empty)	"John wick"	(empty)

Started streaming 2 records after 6 ms and completed after 7 ms.

Assignment 2

CSCI E 63 – Big Data Analytics

Setup CQL Query for Database Deletion:

```
private static final String deleteQueryString = "MATCH (n) OPTIONAL MATCH (n)-[r]-()  
DETACH DELETE n,r";
```

Setup CQL Query for Database Import:

To ensure performant loading and avoiding duplicates it is recommended to create a unique constraint upfront.

```
CREATE CONSTRAINT ON (a:Person) ASSERT p.name IS UNIQUE;  
CREATE CONSTRAINT ON (m:Movie) ASSERT m.title IS UNIQUE;
```

```
private static final String actorImportQueryString = "LOAD CSV WITH HEADERS FROM  
\"file:///Actor.csv\" AS row " +  
    "MERGE (m:Movie {title:row.title}) ON CREATE SET m.year = row.year " +  
    "MERGE (a:Actor {name:row.name}) " +  
    "FOREACH (_ in CASE row.type WHEN \"ACTS_IN\" then [1] else [] end | " +  
    "    MERGE (a)-[r:ACTS_IN]->(m) ON CREATE SET r.role = row.role " + ") ";
```

```
private static final String directorImportQueryString = "LOAD CSV WITH HEADERS FROM  
\"file:///Director.csv\" AS row " +  
    "MERGE (m:Movie {title:row.title}) ON CREATE SET m.year = row.year " +  
    "MERGE (a:Director{name:row.name}) " +  
    "FOREACH (_ in CASE row.type WHEN \"DIRECTED\" then [1] else [] end | " +  
    "    MERGE (a)-[r:DIRECTED]->(m) " + ") ";
```

Setup Steps:

- 1) Download the apoc plugin and place it in the plugins folder
- 2) Add the following lines at the end of neo4j.conf:
 - a. dbms.directories.plugins=c:/Program\ Files/Neo4j\ CE\ 3.2.3/plugins
 - b. dbms.security.procedures.unrestricted=apoc.*
- 3) Add the following lines in the 'Server Configuration' section of neo4j.conf:
 - a. apoc.import.file.enabled=true
 - b. apoc.export.file.enabled=true
- 4) Restart Neo4j. Just stopping and starting server is not enough.
Note: Community edition requires the process 'neo4j-ce.exe' to be killed manually from Task Manager.

Assignment 2

CSCI E 63 – Big Data Analytics

Code Snippet(Class file submitted):

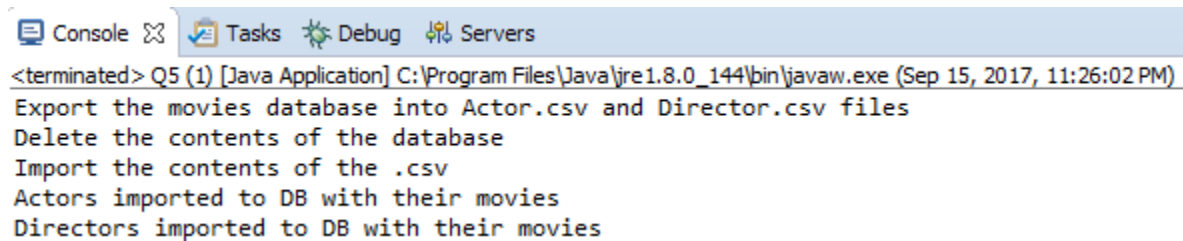
```
driver = GraphDatabase.driver( "bolt://localhost", AuthTokens.basic( "neo4j", "*" ));
session = driver.session();

System.out.println("Export the movies database into Actor.csv and Director.csv
files");
session.run(actorExportQueryString);
session.run(directorExportQueryString);

System.out.println("Delete the contents of the database");
session.run(deleteQueryString);

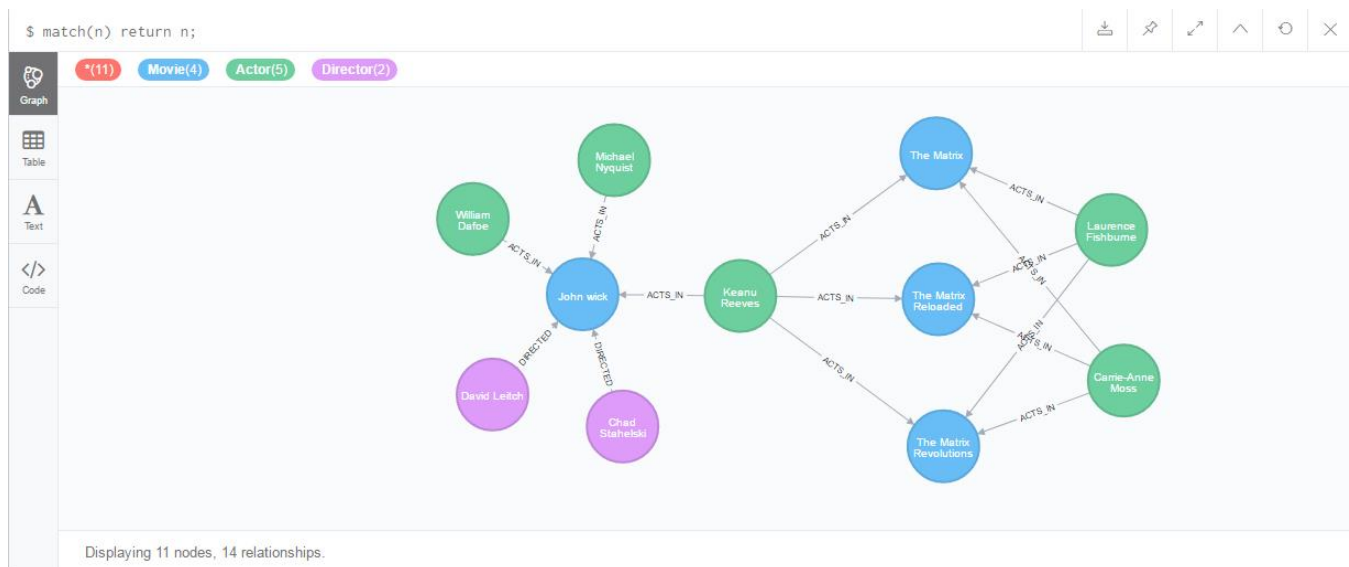
System.out.println("Import the contents of the .csv");
session.run(actorImportQueryString);
System.out.println("Actors imported to DB with their movies");
session.run(directorImportQueryString);
System.out.println("Directors imported to DB with their movies");
```

Console Output:



```
<terminated> Q5 (1) [Java Application] C:\Program Files\Java\jre1.8.0_144\bin\javaw.exe (Sep 15, 2017, 11:26:02 PM)
Export the movies database into Actor.csv and Director.csv files
Delete the contents of the database
Import the contents of the .csv
Actors imported to DB with their movies
Directors imported to DB with their movies
```

Database Final State:



Assignment 2

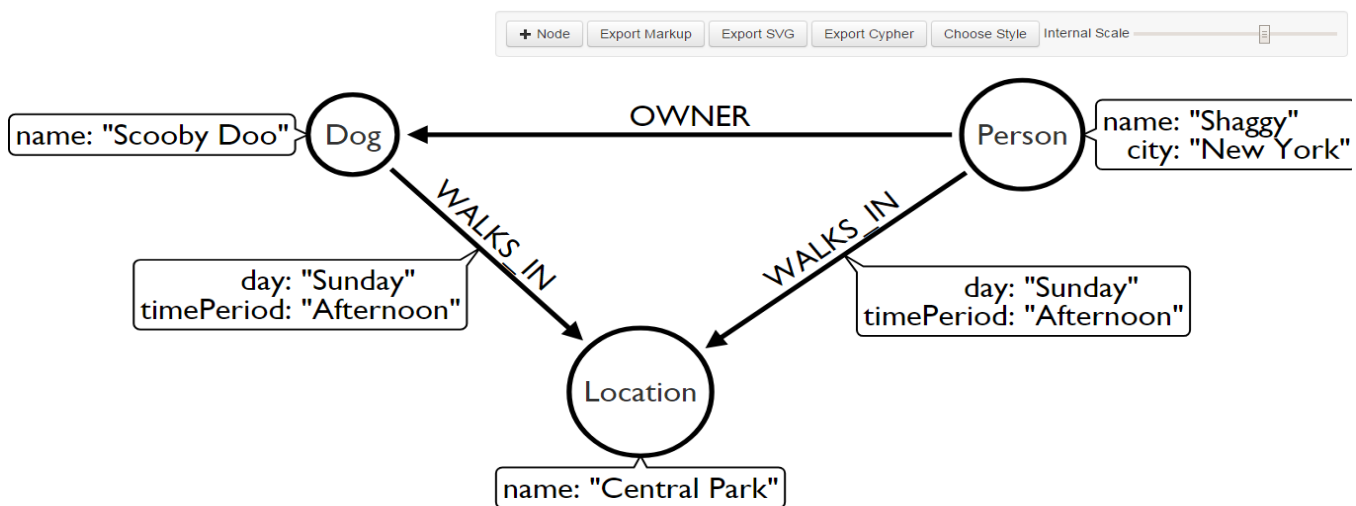
CSCI E 63 – Big Data Analytics

Problem 6.

Find a way to use Arrow Tool (<http://www.apciones.com>) to paint a relationship between a dog and his owner who live in New York and walk through the Central Park on Sunday afternoon. Add Labels and necessary properties to all nodes and relationships. Export your graph in Cypher format and then adjust (if necessary) generated Cypher so that you can create that graph in Neo4J database. Verify that your graph is indeed created using Cypher Browser.

Answer:

- ➔ Paint a relationship between a dog and his owner who live in New York and walk through the Central Park on Sunday afternoon



- ➔ Export your graph in Cypher format

Export as Cypher

```
CREATE
  (`1` :Person {name:"Shaggy",city:"New York"}) ,
  (`2` :Dog {name:"Scooby Doo"}) ,
  (`3` :Location {name:"Central Park"}) ,
  (`1`)-[:`OWNER`]->(`2`),
  (`2`)-[:`WALKS_IN`]->(`3`),
  (`1`)-[:`WALKS_IN`]->(`3`)
```



Assignment 2

CSCI E 63 – Big Data Analytics

➔ Adjust (if necessary) generated Cypher

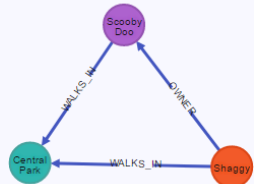
Graph Setup:
CREATE (`1` :Person {name:"Shaggy",city:"New York"}) , (`2` :Dog {name:"Scooby Doo"}) , (`3` :Location {name:"Central Park"}) , (`1`)-[:OWNER]->(`2`), (`2`)-[:WALKS_IN]->(`3`), (`1`)-[:WALKS_IN]->(`3`)

Query:
start n=node(*) return n

n
(0:Person {city:"New York", name:"Shaggy"})
(1:Dog {name:"Scooby Doo"})
(2:Location {name:"Central Park"})

Query took 7 ms and returned 3 rows. [Result Details](#)

You can modify and query this graph by entering statements in the input field at the bottom.
For some syntax help hit the [Help](#) button.
If you want to share your graph, just do it with [Share](#)



```
graph TD; Shaggy((Shaggy)) -- OWNER --> ScoobyDoo((Scooby Doo)); ScoobyDoo -- WALKS_IN --> CentralPark((Central Park)); Shaggy -- WALKS_IN --> CentralPark;
```

➔ Graph Setup Query

```
CREATE (`1` :Person {name:"Shaggy",city:"New York"}) , (`2` :Dog {name:"Scooby Doo"}) , (`3` :Location {name:"Central Park"}) , (`1`)-[:OWNER]->(`2`), (`2`)-[:WALKS_IN]->(`3`), (`1`)-[:WALKS_IN]->(`3`)
```

➔ Graph Validation Query

```
start n=node(*) return n
```

➔ Cypher Browser Validation

\$ start n=node(*) return n

Graph

Table

Text

Warn

Code

n
{ "city": "New York", "name": "Shaggy" }
{ "name": "Scooby Doo" }
{ "name": "Central Park" }

