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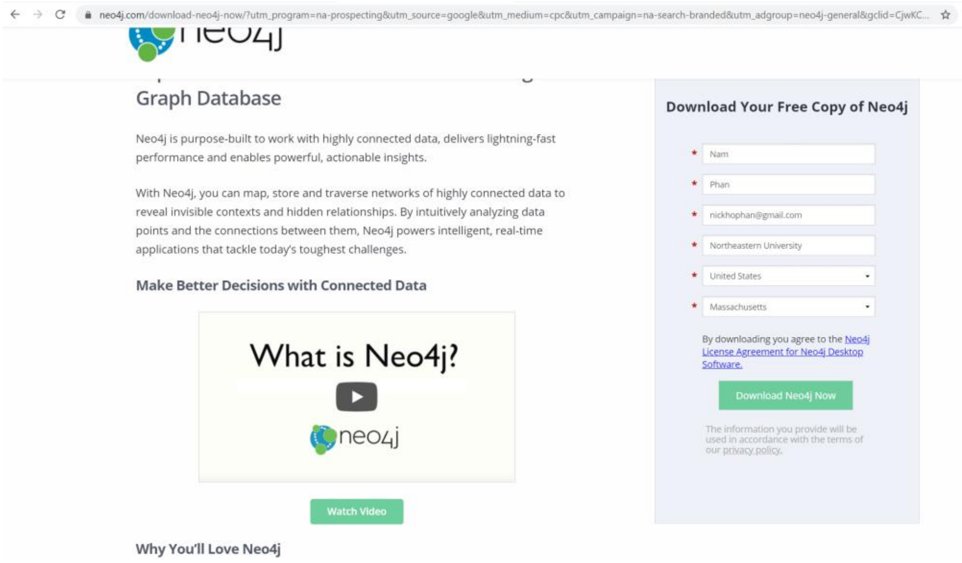
**Northeastern University**

# How to use neo4j to visualize real-time data

To install neo4j, I must go to its website and register by my email. After downloading the install file into computer successfully, I run that file to set up it in my desktop.



neo4j.com/download-neo4j-now/?utm_program=na-prospecting&utm_source=google&utm_medium=cpc&utm_campaign=na-search-branded&utm_adgroup=neo4j-general&gclid=CjwKC...

Graph Database

Neo4j is purpose-built to work with highly connected data, delivers lightning-fast performance and enables powerful, actionable insights.

With Neo4j, you can map, store and traverse networks of highly connected data to reveal invisible contexts and hidden relationships. By intuitively analyzing data points and the connections between them, Neo4j powers intelligent, real-time applications that tackle today's toughest challenges.

Make Better Decisions with Connected Data

What is Neo4j?

Watch Video

Why You'll Love Neo4j

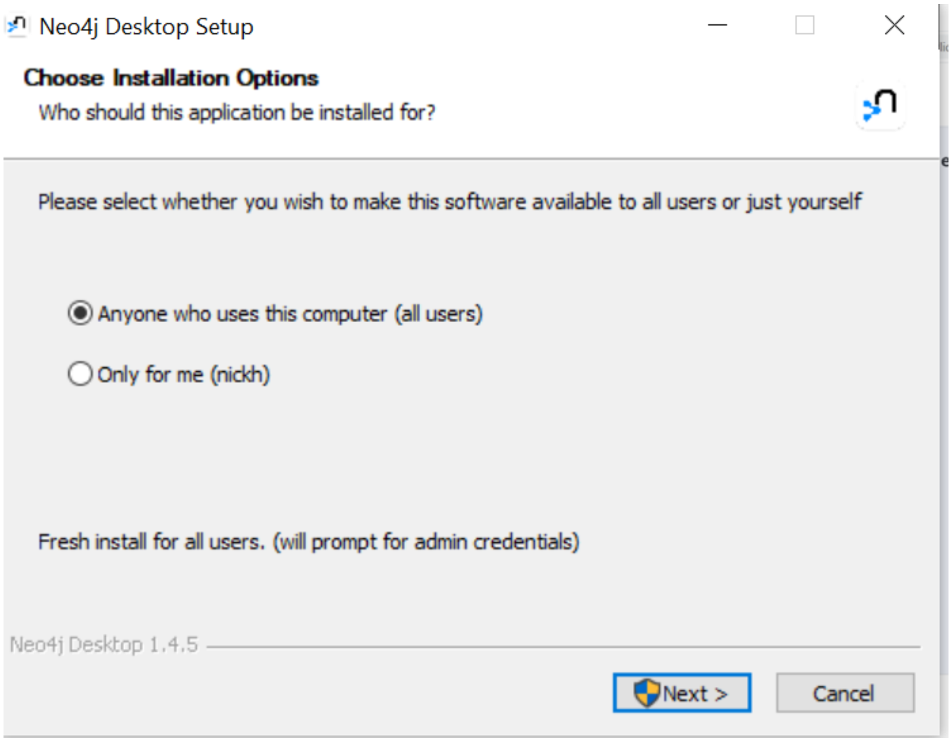
Download Your Free Copy of Neo4j

- Nam
- Phan
- nickhophan@gmail.com
- Northeastern University
- United States
- Massachusetts

By downloading you agree to the Neo4j License Agreement for Neo4j Desktop Software.

Download Neo4j Now

The information you provide will be used in accordance with the terms of our privacy policy.



Neo4j Desktop Setup

**Choose Installation Options**

Who should this application be installed for?

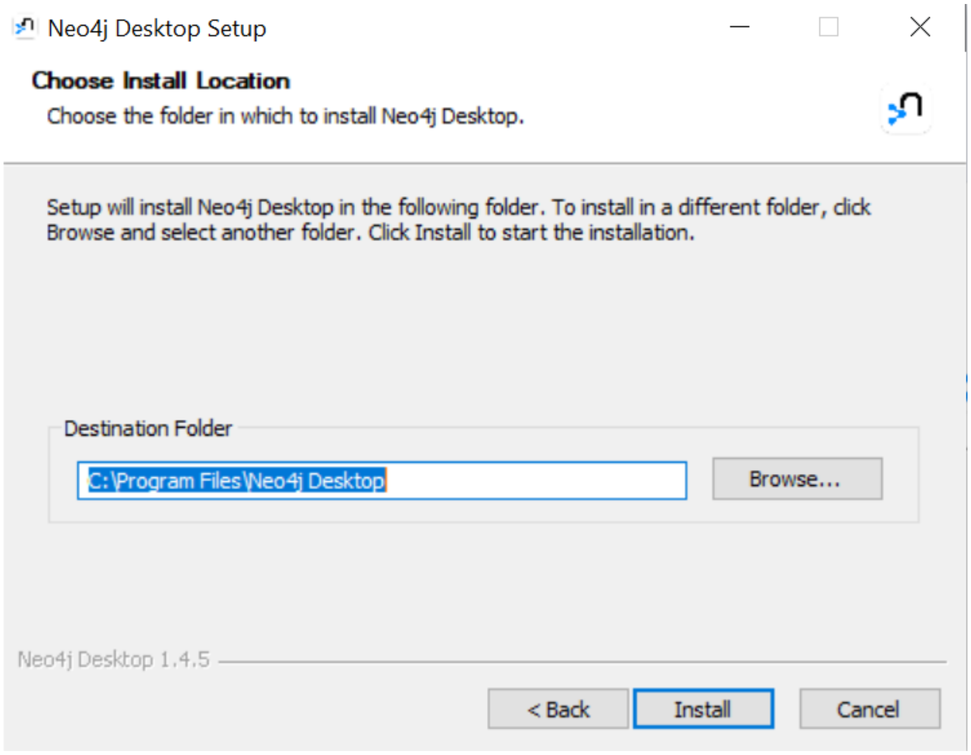
Please select whether you wish to make this software available to all users or just yourself

● Anyone who uses this computer (all users)

○ Only for me (nickh)

Fresh install for all users. (will prompt for admin credentials)

Neo4j Desktop 1.4.5



Neo4j Desktop Setup

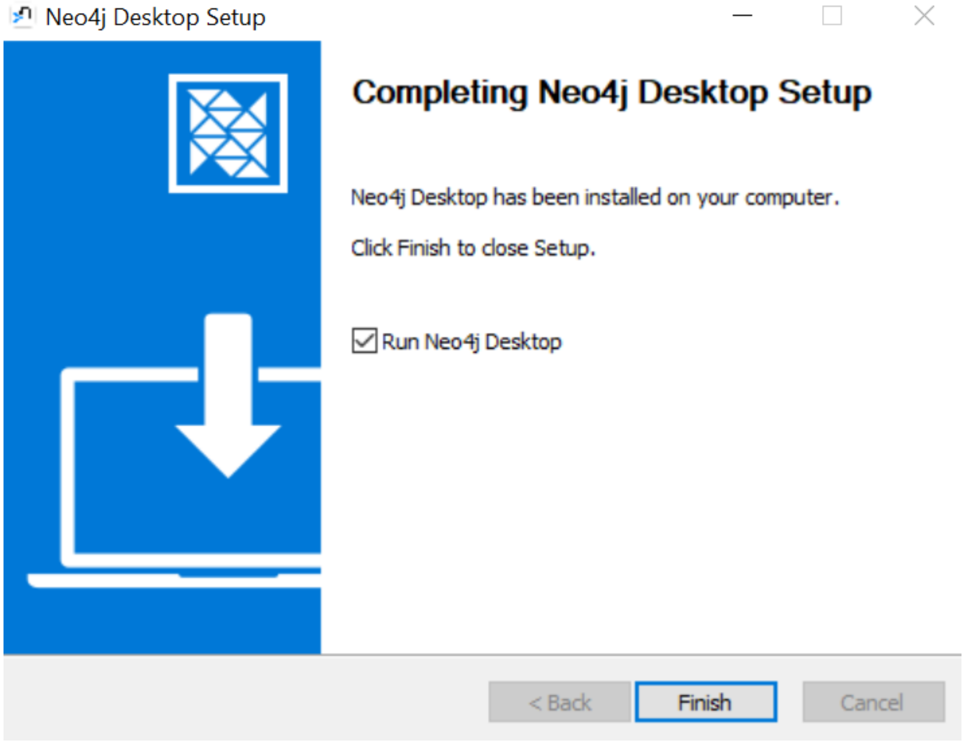
**Choose Install Location**

Choose the folder in which to install Neo4j Desktop.

Setup will install Neo4j Desktop in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.

Destination Folder

C:\Program Files\Neo4j Desktop



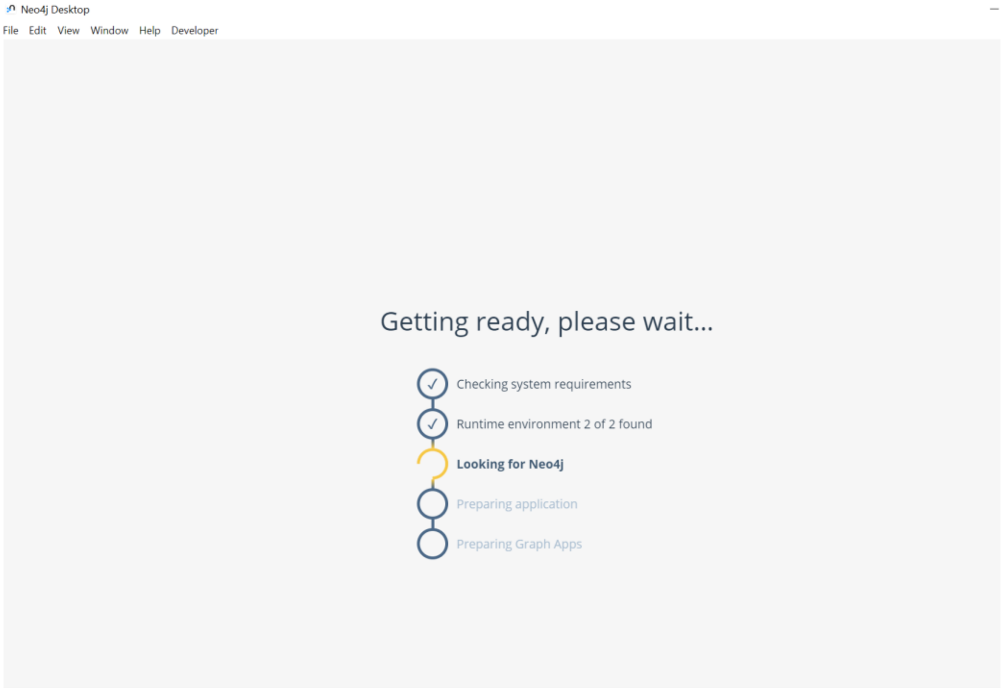
Neo4j Desktop Setup

**Completing Neo4j Desktop Setup**

Neo4j Desktop has been installed on your computer.

Click Finish to close Setup.

☑ Run Neo4j Desktop

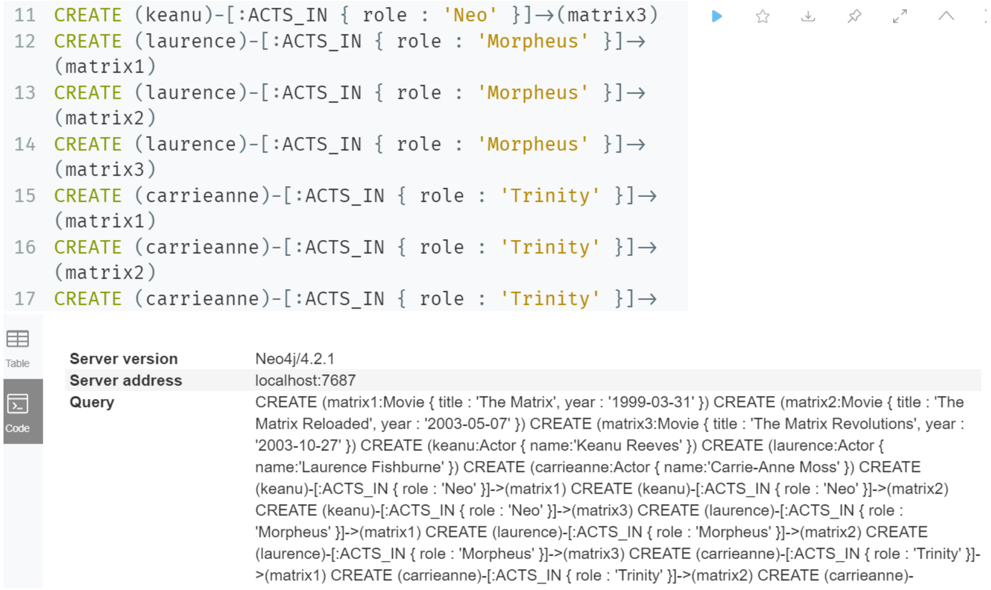


Getting ready, please wait...

- ✓ Checking system requirements
- ✓ Runtime environment 2 of 2 found
- Looking for Neo4j
- ○ Preparing application
- ○ Preparing Graph Apps

## Problem 2:

For problem 2, I use CREATE function to load information into database

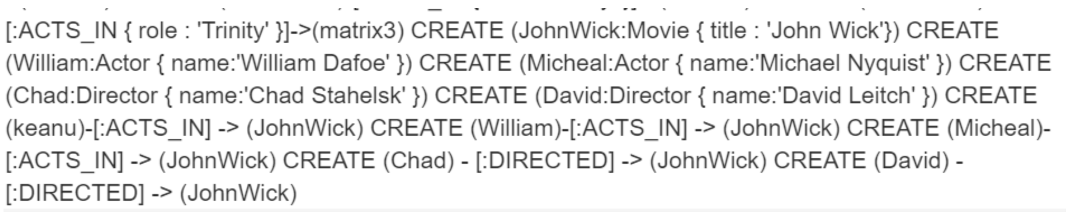


```
CREATE (keanu)-[:ACTS_IN { role : 'Neo' }]->(matrix3)
CREATE (laurence)-[:ACTS_IN { role : 'Morpheus' }]->(matrix1)
CREATE (laurence)-[:ACTS_IN { role : 'Morpheus' }]->(matrix2)
CREATE (laurence)-[:ACTS_IN { role : 'Morpheus' }]->(matrix3)
CREATE (carrieanne)-[:ACTS_IN { role : 'Trinity' }]->(matrix1)
CREATE (carrieanne)-[:ACTS_IN { role : 'Trinity' }]->(matrix2)
CREATE (carrieanne)-[:ACTS_IN { role : 'Trinity' }]->
```

| | |
|---|---|
| Server version | Neo4j/4.2.1 |
| Server address | localhost:7687 |
| Query | 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)- |

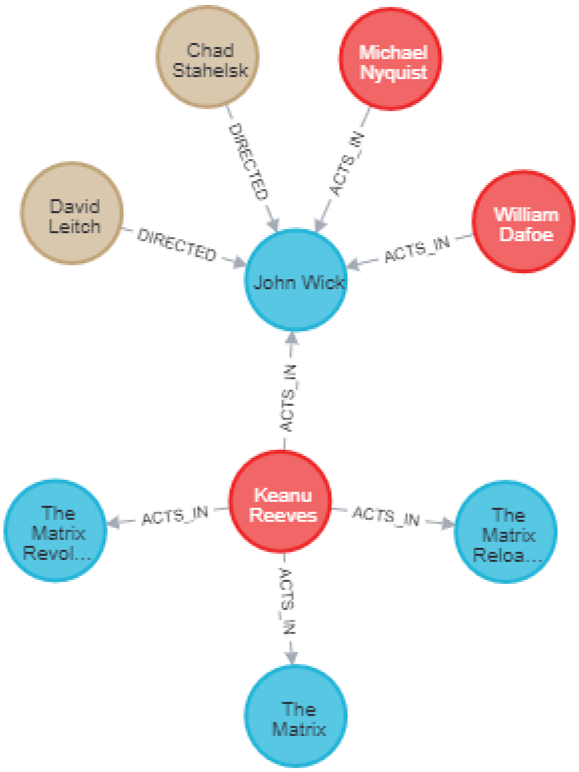
## Problem 3:

For problem 3, I also use CREATE to set up information with the title of movie, relevant actors, and directors.



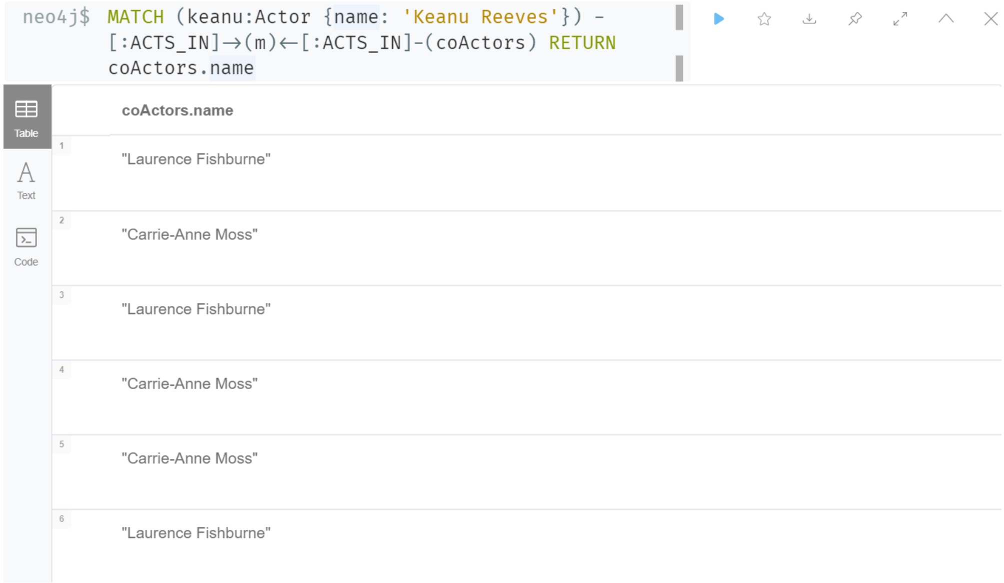
```
[:ACTS_IN { role : 'Trinity' }]->(matrix3) CREATE (JohnWick:Movie { title : 'John Wick'}) CREATE
(William:Actor { name:'William Dafoe' }) CREATE (Micheal:Actor { name:'Michael Nyquist' }) CREATE
(Chad:Director { name:'Chad Stahelsk' }) CREATE (David:Director { name:'David Leitch' }) CREATE
(keanu)-[:ACTS_IN] -> (JohnWick) CREATE (William)-[:ACTS_IN] -> (JohnWick) CREATE (Micheal)-
[:ACTS_IN] -> (JohnWick) CREATE (Chad) - [:DIRECTED] -> (JohnWick) CREATE (David) -
[:DIRECTED] -> (JohnWick)
```

To visualize the node John Wick, I use MATCH function and it will give back to me the nodes and relationship related to John Wick.



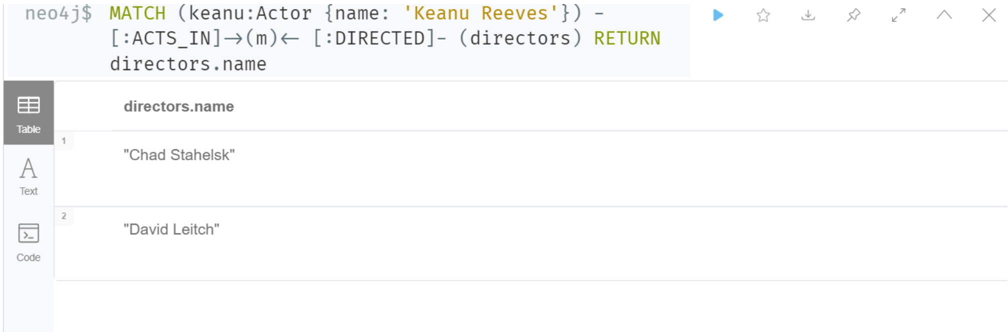
## Problem 4:

To find co actors, I use MATCH function with name as ‘Keanu Reeves’, and use [:ACTS_IN] variable to set the relation.



```
neo4j$ MATCH (keanu:Actor {name: 'Keanu Reeves'}) -
       [:ACTS_IN]→(m)←[:ACTS_IN]-(coActors) RETURN
       coActors.name
```

| | coActors.name |
|---|---|
| 1 | "Laurence Fishburne" |
| 2 | "Carrie-Anne Moss" |
| 3 | "Laurence Fishburne" |
| 4 | "Carrie-Anne Moss" |
| 5 | "Carrie-Anne Moss" |
| 6 | "Laurence Fishburne" |

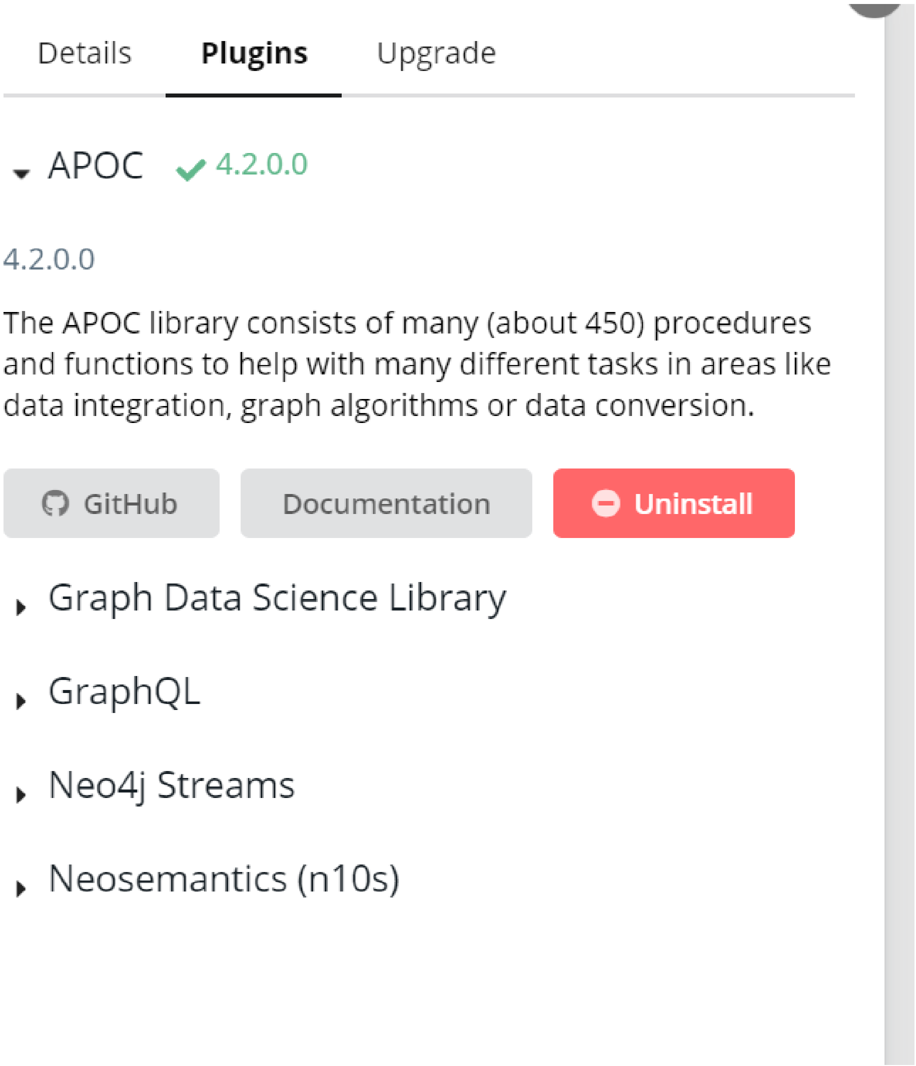


```
neo4j$ MATCH (keanu:Actor {name: 'Keanu Reeves'}) -
       [:ACTS_IN]→(m)← [:DIRECTED]- (directors) RETURN
       directors.name
```

| | directors.name |
|---|---|
| 1 | "Chad Stahelsk" |
| 2 | "David Leitch" |

## Problem 5:

To be able to export and import the csv file, I must install APOC in plugins.



Details **Plugins** Upgrade

APOC ✓ 4.2.0.0

4.2.0.0

The APOC library consists of many (about 450) procedures and functions to help with many different tasks in areas like data integration, graph algorithms or data conversion.

GitHub Documentation Uninstall

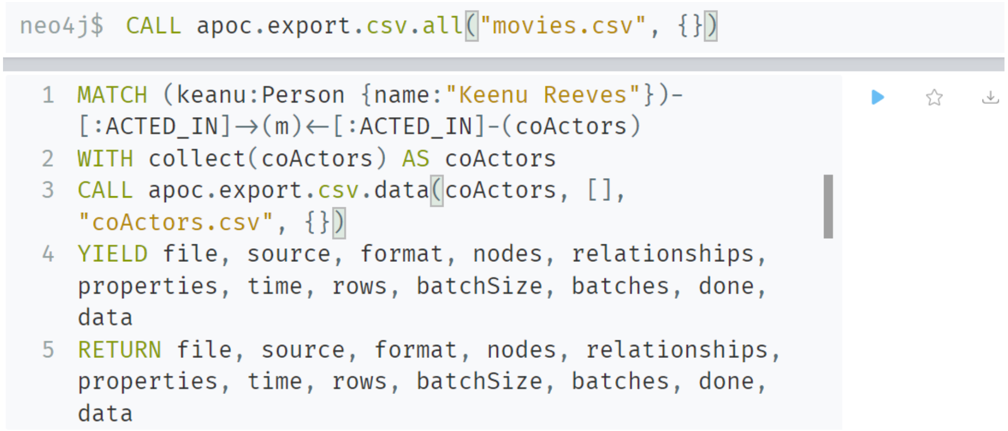
Graph Data Science Library

GraphQL

Neo4j Streams

Neosemantics (n10s)

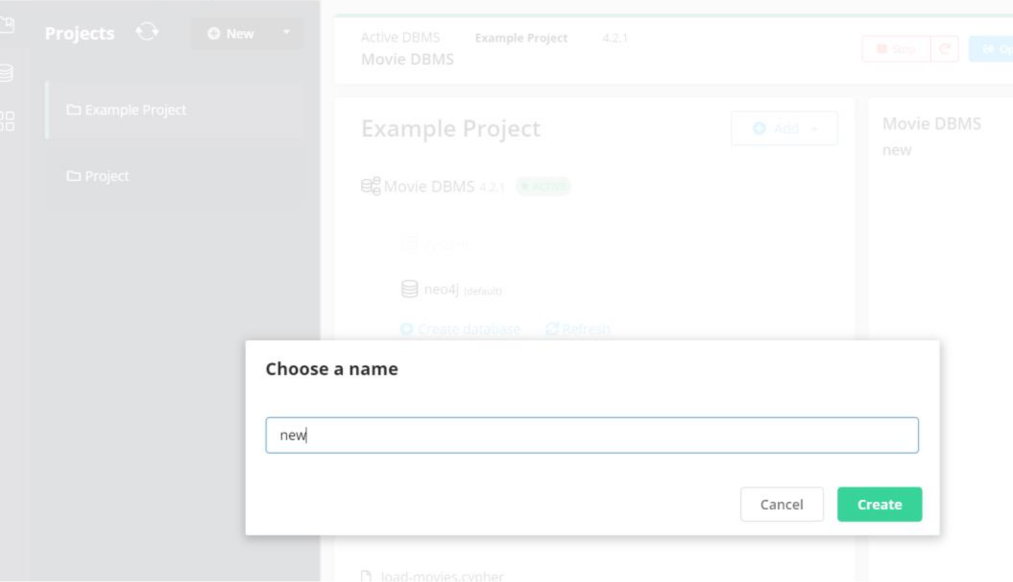
To export the database, I will use CALL, YIELD, RETURN to save file into folder.



```
neo4j$ CALL apoc.export.csv.all("movies.csv", {})
```

```
MATCH (keanu:Person {name:"Keenu Reeves"})-[:ACTED_IN]->(m)<-[:ACTED_IN]-(coActors)
WITH collect(coActors) AS coActors
CALL apoc.export.csv.data(coActors, [], "coActors.csv", {})
YIELD file, source, format, nodes, relationships, properties, time, rows, batchSize, batches, done, data
RETURN file, source, format, nodes, relationships, properties, time, rows, batchSize, batches, done, data
```

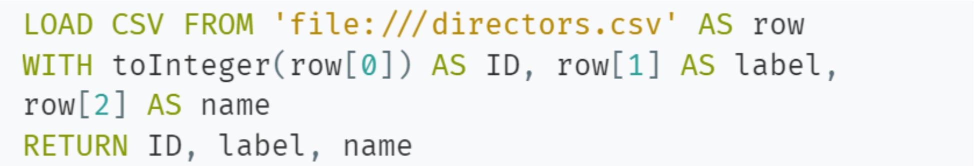
After that, I create new project as ‘new’ to open the database, then I use LOAD CSV from ‘file:///file.csv’ AS row to extract file from folder.



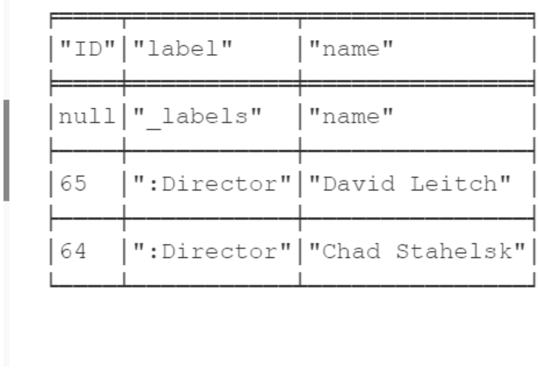
Choose a name

new

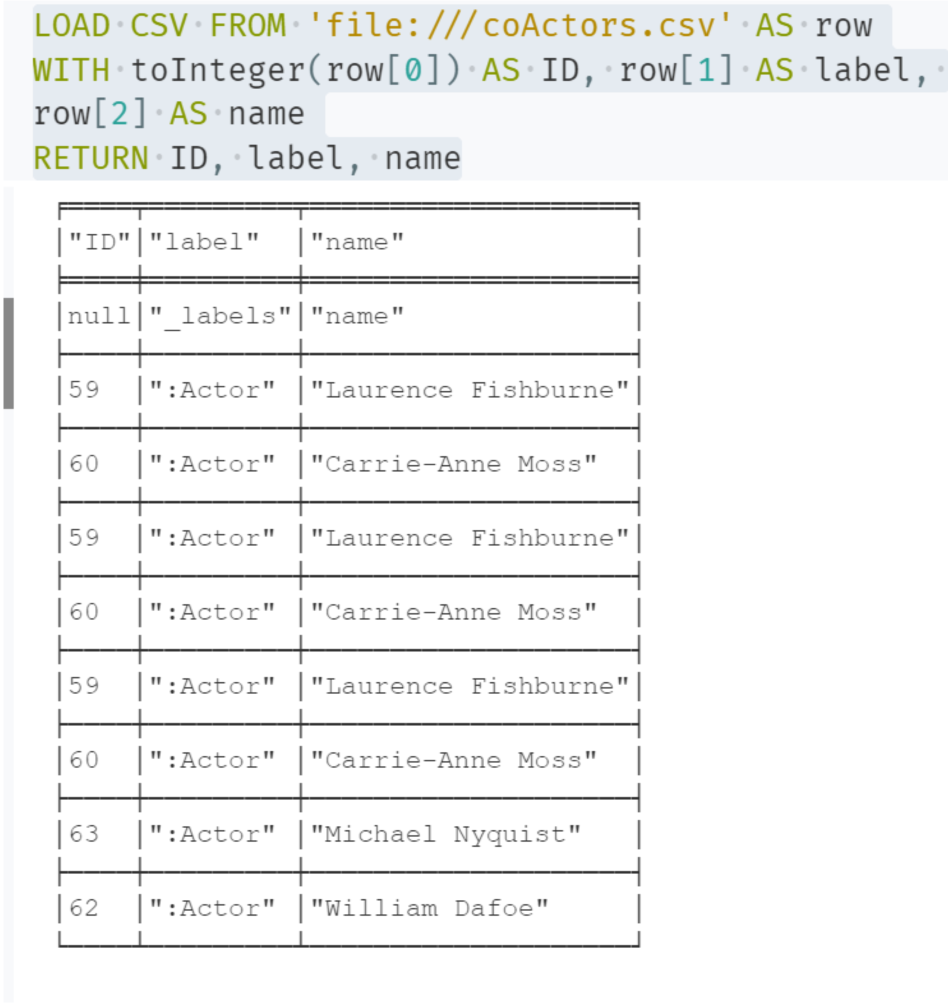
Cancel Create



```
LOAD CSV FROM 'file:///directors.csv' AS row
WITH toInteger(row[0]) AS ID, row[1] AS label,
row[2] AS name
RETURN ID, label, name
```

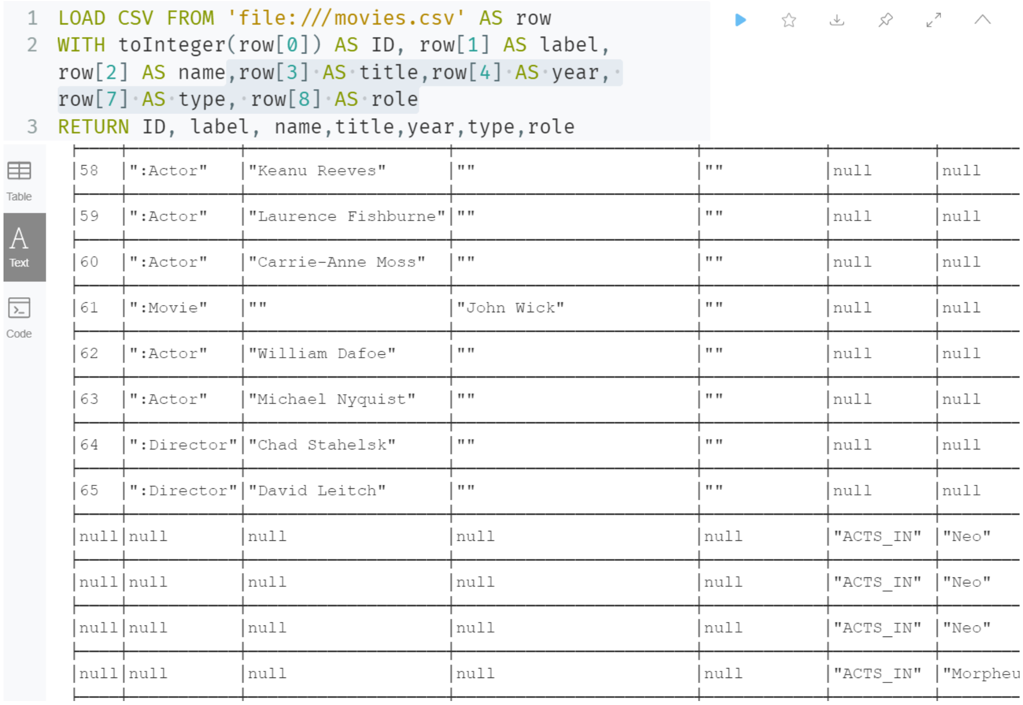


```
╒════╤════════════╤═══════════════╕
│"ID"│"label"     │"name"         │
╞════╪════════════╪═══════════════╡
│null│"_labels"   │"name"         │
├────┼────────────┼───────────────┤
│65  │":Director"│"David Leitch" │
├────┼────────────┼───────────────┤
│64  │":Director"│"Chad Stahelsk"│
└────┴────────────┴───────────────┘
```



```
LOAD CSV FROM 'file:///coActors.csv' AS row
WITH toInteger(row[0]) AS ID, row[1] AS label, 
row[2] AS name
RETURN ID, label, name
```

```
╒════╤══════════╤═══════════════════╕
│"ID"│"label"   │"name"             │
╞════╪══════════╪═══════════════════╡
│null│"_labels" │"name"             │
├────┼──────────┼───────────────────┤
│59  │":Actor"  │"Laurence Fishburne"│
├────┼──────────┼───────────────────┤
│60  │":Actor"  │"Carrie-Anne Moss" │
├────┼──────────┼───────────────────┤
│59  │":Actor"  │"Laurence Fishburne"│
├────┼──────────┼───────────────────┤
│60  │":Actor"  │"Carrie-Anne Moss" │
├────┼──────────┼───────────────────┤
│59  │":Actor"  │"Laurence Fishburne"│
├────┼──────────┼───────────────────┤
│60  │":Actor"  │"Carrie-Anne Moss" │
├────┼──────────┼───────────────────┤
│63  │":Actor"  │"Michael Nyquist"  │
├────┼──────────┼───────────────────┤
│62  │":Actor"  │"William Dafoe"    │
└────┴──────────┴───────────────────┘
```

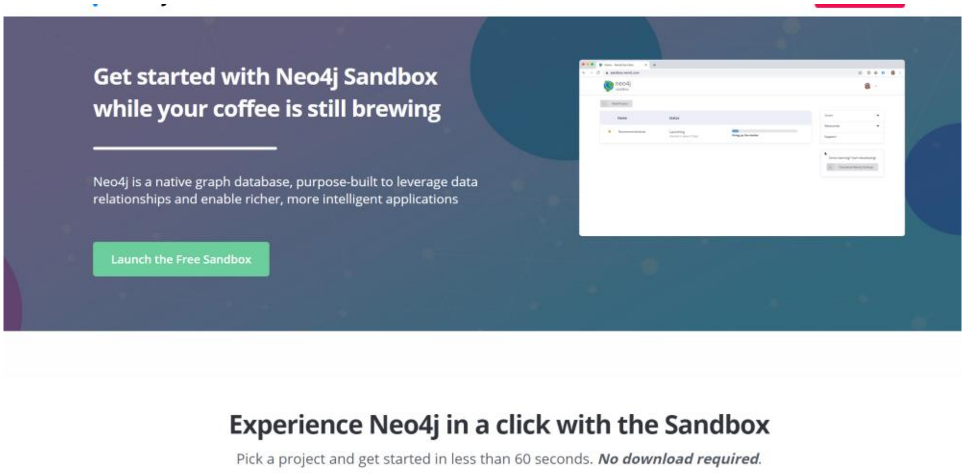


```
LOAD CSV FROM 'file:///movies.csv' AS row
WITH toInteger(row[0]) AS ID, row[1] AS label,
row[2] AS name,row[3] AS title,row[4] AS year,
row[7] AS type, row[8] AS role
RETURN ID, label, name,title,year,type,role
```

```
│58  │":Actor"   │"Keanu Reeves"      │""                  │""        │null     │null
│59  │":Actor"   │"Laurence Fishburne"│""                  │""        │null     │null
│60  │":Actor"   │"Carrie-Anne Moss"  │""                  │""        │null     │null
│61  │":Movie"   │""                  │"John Wick"         │""        │null     │null
│62  │":Actor"   │"William Dafoe"     │""                  │""        │null     │null
│63  │":Actor"   │"Michael Nyquist"   │""                  │""        │null     │null
│64  │":Director"│"Chad Stahelsk"     │""                  │""        │null     │null
│65  │":Director"│"David Leitch"      │""                  │""        │null     │null
│null│null       │null                │null                │null      │"ACTS_IN"│"Neo"
│null│null       │null                │null                │null      │"ACTS_IN"│"Neo"
│null│null       │null                │null                │null      │"ACTS_IN"│"Neo"
│null│null       │null                │null                │null      │"ACTS_IN"│"Morpheu
```

## Problem 6:

I click on the link of Sandbox and click on the Launch icon below. After that, I use my email to register to use the application.

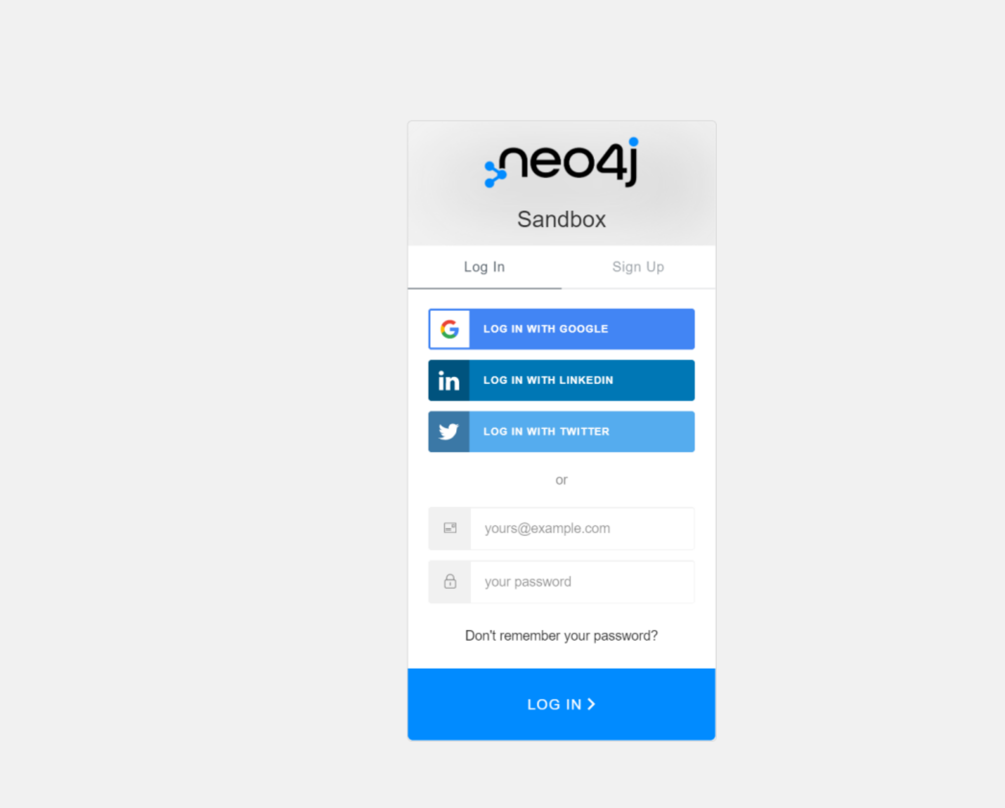


Get started with Neo4j Sandbox while your coffee is still brewing

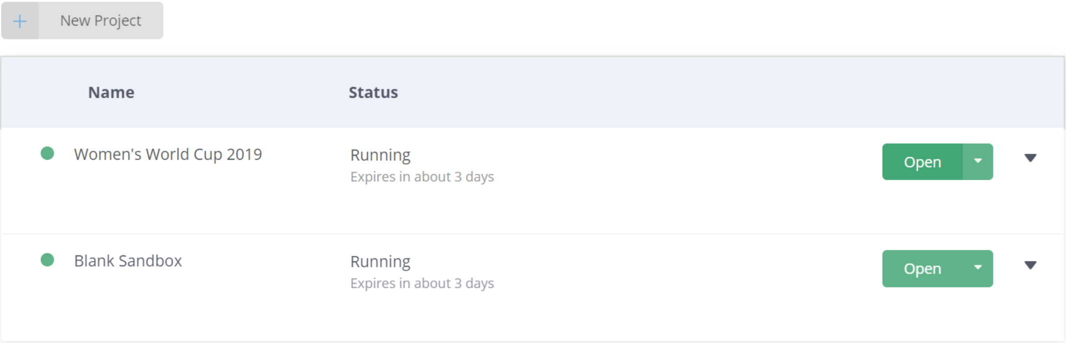
Neo4j is a native graph database, purpose-built to leverage data relationships and enable richer, more intelligent applications

Experience Neo4j in a click with the Sandbox

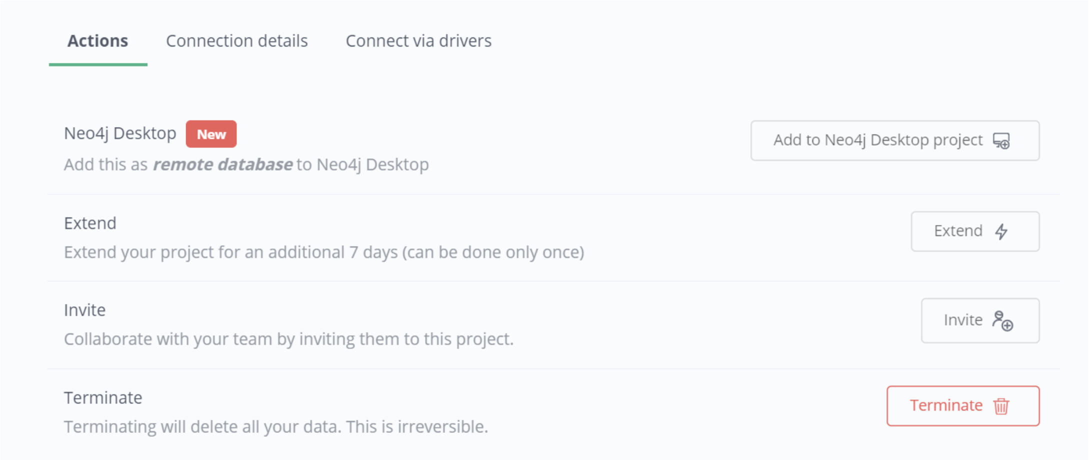
Pick a project and get started in less than 60 seconds. *No download required*.



Below is the projects I try creating and run some codes to see the examples.



| Name | Status | | |
|---|---|---|---|
| ● Women's World Cup 2019 | Running<br>Expires in about 3 days | Open ▾ | ▼ |
| ● Blank Sandbox | Running<br>Expires in about 3 days | Open ▾ | ▼ |



Neo4j Desktop New

Add this as ***remote database*** to Neo4j Desktop

Extend

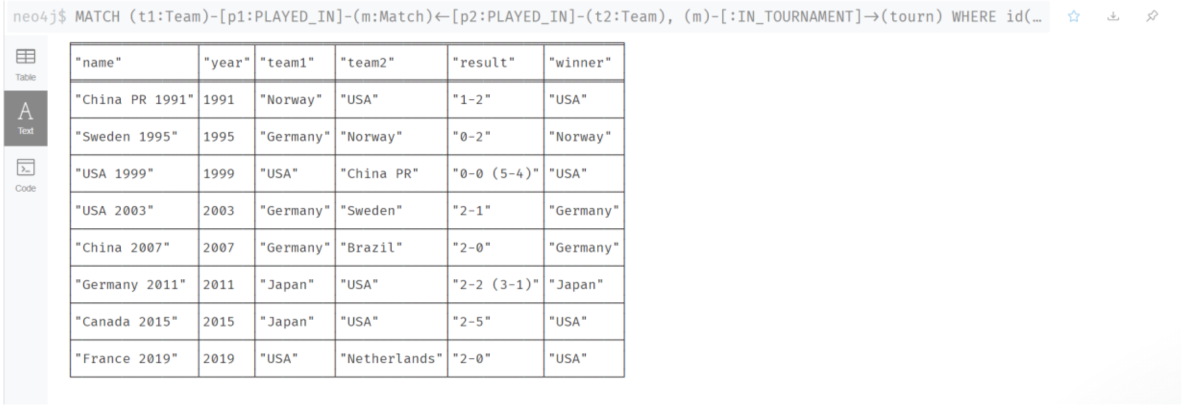
Extend your project for an additional 7 days (can be done only once)

Invite

Collaborate with your team by inviting them to this project.

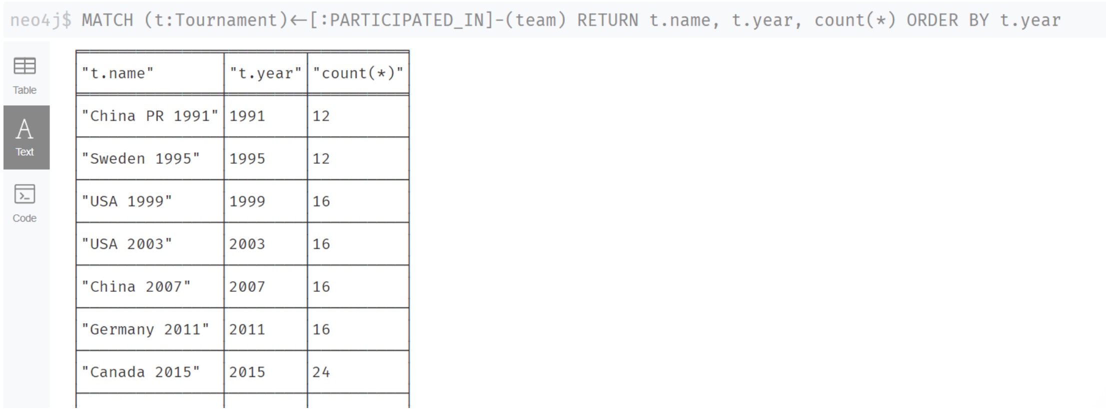
Terminate

Terminating will delete all your data. This is irreversible.



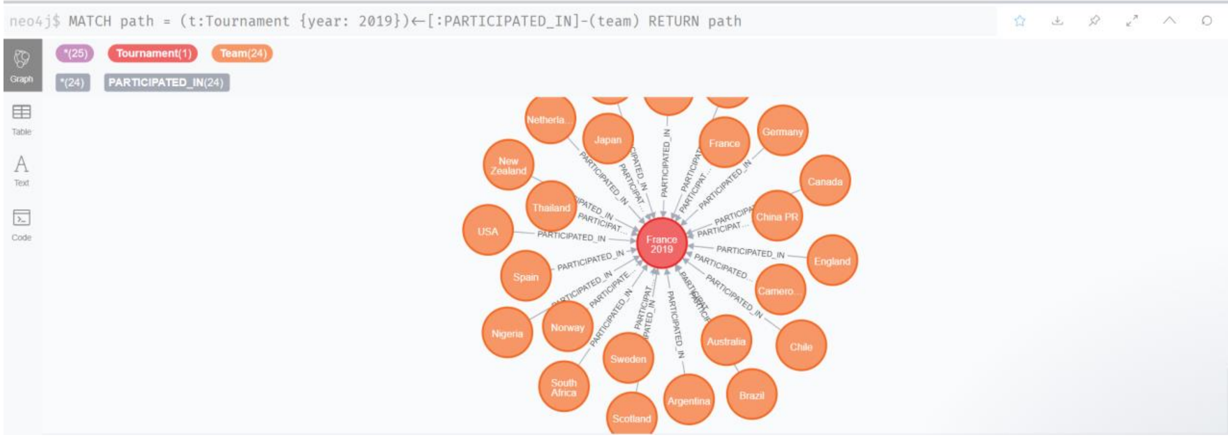
```
neo4j$ MATCH (t1:Team)-[p1:PLAYED_IN]-(m:Match)←[p2:PLAYED_IN]-(t2:Team), (m)-[:IN_TOURNAMENT]→(tourn) WHERE id(…
```

| "name" | "year" | "team1" | "team2" | "result" | "winner" |
|---|---|---|---|---|---|
| "China PR 1991" | 1991 | "Norway" | "USA" | "1-2" | "USA" |
| "Sweden 1995" | 1995 | "Germany" | "Norway" | "0-2" | "Norway" |
| "USA 1999" | 1999 | "USA" | "China PR" | "0-0 (5-4)" | "USA" |
| "USA 2003" | 2003 | "Germany" | "Sweden" | "2-1" | "Germany" |
| "China 2007" | 2007 | "Germany" | "Brazil" | "2-0" | "Germany" |
| "Germany 2011" | 2011 | "Japan" | "USA" | "2-2 (3-1)" | "Japan" |
| "Canada 2015" | 2015 | "Japan" | "USA" | "2-5" | "USA" |
| "France 2019" | 2019 | "USA" | "Netherlands" | "2-0" | "USA" |



```
neo4j$ MATCH (t:Tournament)←[:PARTICIPATED_IN]-(team) RETURN t.name, t.year, count(*) ORDER BY t.year
```

```
│"t.name"         │"t.year"│"count(*)"│
├─────────────────┼────────┼──────────┤
│"China PR 1991"  │1991    │12        │
├─────────────────┼────────┼──────────┤
│"Sweden 1995"    │1995    │12        │
├─────────────────┼────────┼──────────┤
│"USA 1999"       │1999    │16        │
├─────────────────┼────────┼──────────┤
│"USA 2003"       │2003    │16        │
├─────────────────┼────────┼──────────┤
│"China 2007"     │2007    │16        │
├─────────────────┼────────┼──────────┤
│"Germany 2011"   │2011    │16        │
├─────────────────┼────────┼──────────┤
│"Canada 2015"    │2015    │24        │
├─────────────────┼────────┼──────────┤
```



```
neo4j$ MATCH path = (t:Tournament {year: 2019})←[:PARTICIPATED_IN]-(team) RETURN path
```