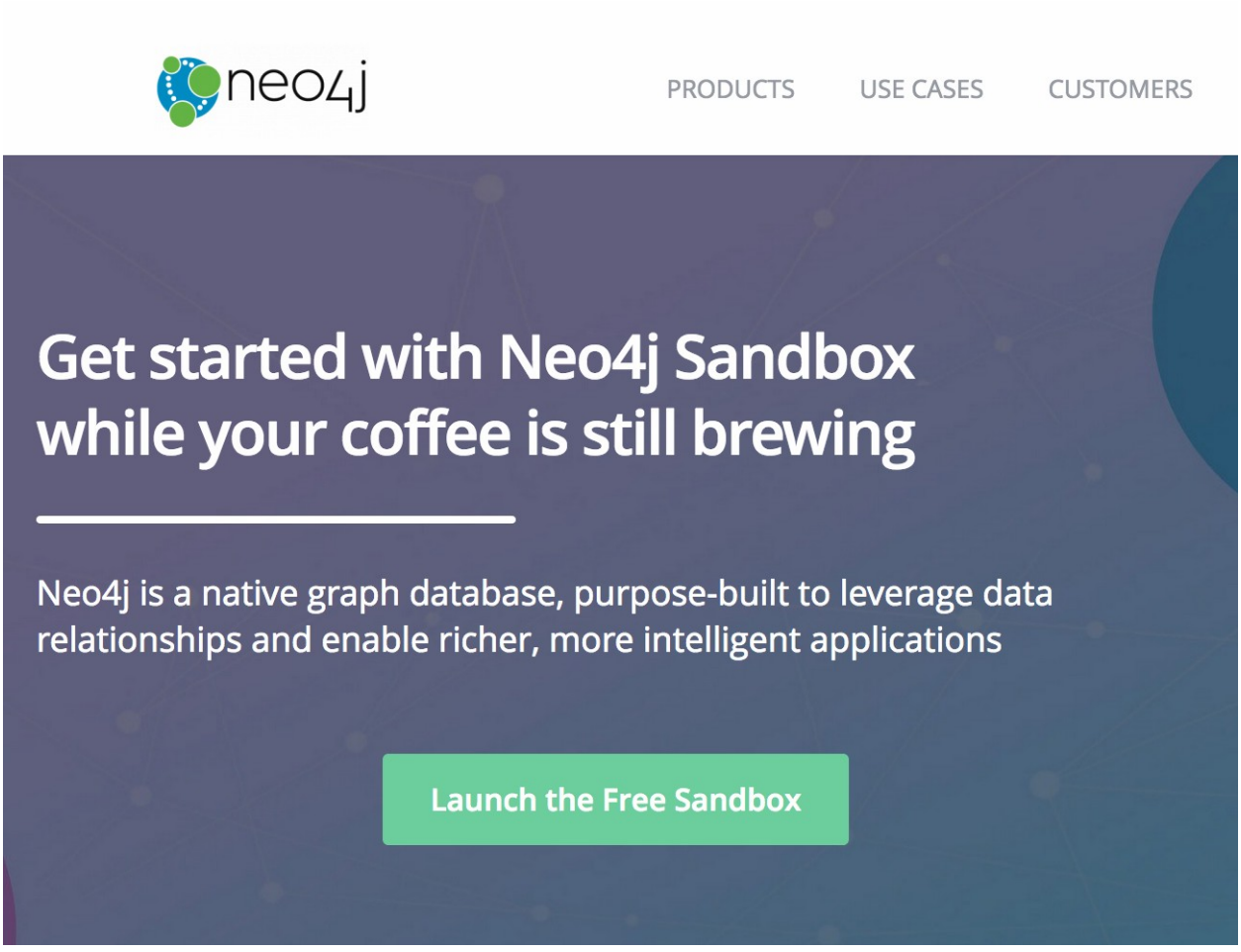
Lab Task of Graph Database Neo4j

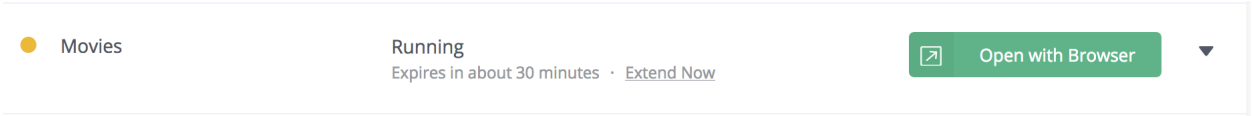
1. Access Neo4j SandBox by the following URI:

https://sandbox.neo4j.com/login

2. Launch the free Sandbox:



3. Select Movies database:



A. Nodes and Relationships in Neo4j

- **Query:**

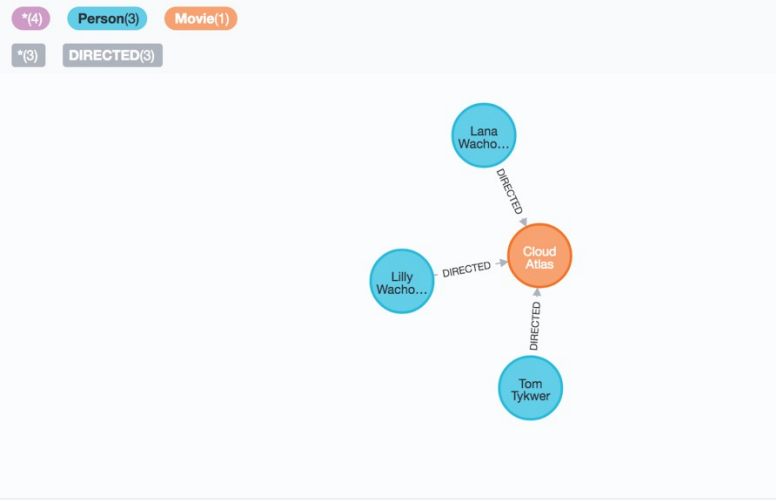
Match (m:Movie) where m.released > 2000 RETURN m limit 5

Expected Result: The above query will return all the movies that were released after the year 2000 limiting the result to 5 items.

- **Query:**

MATCH (p:Person)-[d:DIRECTED]-(m:Movie) where m.released > 2010 RETURN p,d,m

Expected Result: The above query will return all Person nodes who directed a movie that was released after 2010.

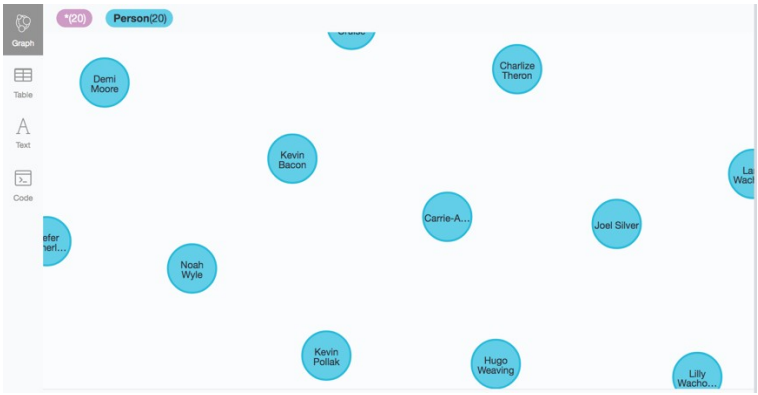


B. Labels

- **Query:**

MATCH (p:Person) RETURN p limit 20

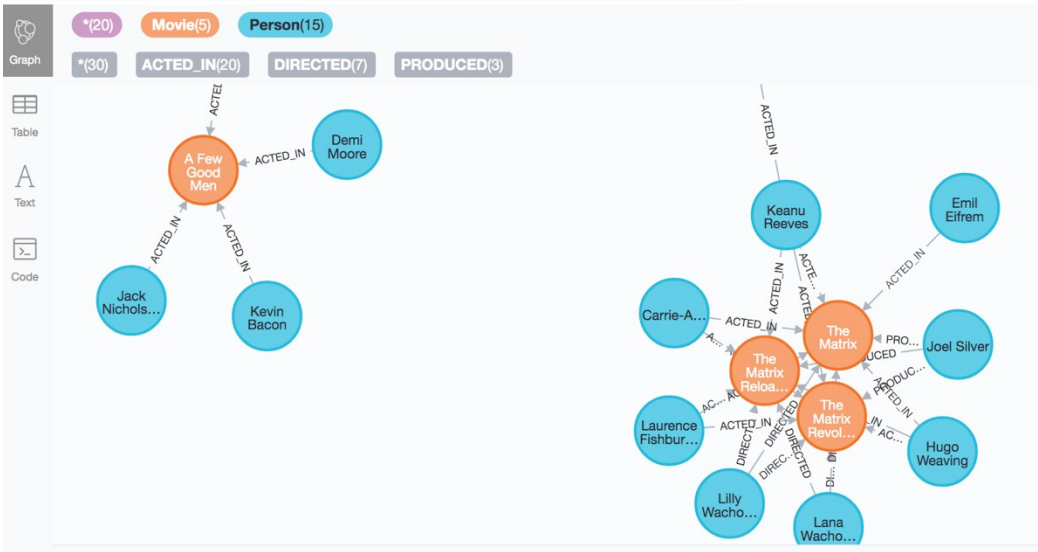
Expected Result: it will return only `Person` Nodes (limiting to 20 items) while



- **Query:**

MATCH (n) RETURN n limit 20

Expected Result: it will return all kinds of nodes (limiting to 20 items) while



C.Properties

- **Query:**

MATCH (m:Movie) return m.title, m.released

Expected Result - This will return Movie nodes but with only the `title` and `released` properties.

m.title	m.released
"The Devil's Advocate"	1997
"A Few Good Men"	1992
"Top Gun"	1986
"Jerry Maguire"	2000
"Stand By Me"	1986
"As Good as It Gets"	1997

D. Create a Node

- **Query:**

```
Create (p:Person {name: 'YourName'}) RETURN p
```

Expected Result - The above statement will create a new `Person` node with property `name` having value `YourName`.

E. Finding Nodes with Match and Where Clause

- **Query:**

```
Match (p:Person {name: 'Tom Hanks'}) RETURN p
```

Expected Result - The above statement will return a `Person` node with property `name` having value `Tom Hanks`.

F. Merge Clause

The `Merge` clause is used to either

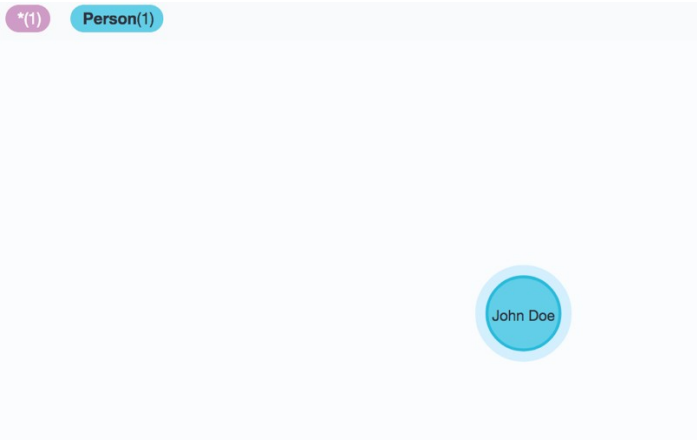
1. match the existing nodes and bind them or
2. create new node(s) and bind them

It is a combination of `Match` and `Create` and additionally allows to specify additional actions if the data was matched or created.

- **Query:**

```
MERGE (p:Person {name: 'John Doe'})
ON MATCH SET p.lastLoggedInAt = timestamp()
ON CREATE SET p.createdAt = timestamp()
Return p
```

Expected Result - The above statement will create the Person node if it does not exist. If the node already exists, then it will set the property `lastLoggedInAt` to the current timestamp. If node did not exist and was newly created instead, then it will set the `createdAt` property to the current timestamp.



G. Create a Relationship

- **Query:**

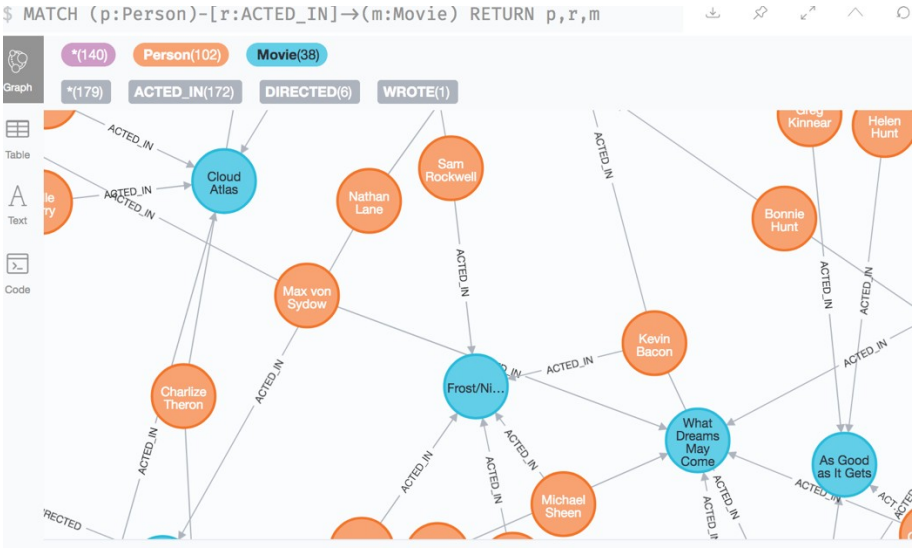
```
MATCH (p:Person), (m:Movie)
WHERE p.name = "Tom Hanks" and m.title = "Cloud Atlas"
CREATE (p)-[w:WATCHED]->(m)
RETURN type(w)
```

Expected Result - The above statement will create a relationship `:WATCHED` between the existing `Person` and `Movie` nodes and return the type of relationship (i.e `WATCHED`).

H. Relationship Types

In Neo4j, there can be 2 kinds of relationships - **incoming** and **outgoing**.
To denote an outgoing or an incoming relationship in cypher, we use → or ←.

```
MATCH (p:Person)-[r:ACTED_IN]->(m:Movie) RETURN p,r,m
or
MATCH (p:Person)-[r:ACTED_IN]-(m:Movie) RETURN p,r,m
```



I. Advcanced Cypher queries

- **Finding who directed “Cloud Atlas” movie**

```
MATCH (m:Movie {title: 'Cloud Atlas'})<-[d:DIRECTED]-(p:Person)
return p.name
```

- **Finding all people who have co-acted with Tom Hanks in any movie**

```
MATCH (tom:Person {name: "Tom Hanks"})-[:ACTED_IN]-
>(:Movie)<-[:ACTED_IN]-(p:Person) return p.name
```

- **Finding all people related to the movie Cloud Atlas in any way**

```
MATCH (p:Person)-[relatedTo]-(m:Movie {title: "Cloud Atlas"})
return p.name, type(relatedTo)
```

- **Finding Movies and Actors that are 3 hops away from Kevin Bacon.**

```
MATCH (p:Person {name: 'Kevin Bacon'})-[*1..3]-(hollywood) return
DISTINCT p, hollywood
```

in the above query, `hollywood` refers to any node in the database (in this case `Person` and `Movie` nodes)