TY B.Tech. (CSE) – II [2022-23]
5CS372 : Advanced Database System Lab.
Assignment No. 12

Spatial and Geographic Data
Geospatial is the natural domain for Graph Database
Use Neo4j and Neo4j Spatial

Problem Statement : Finding Things Close to Other Things.
Application in : location-based services on the web

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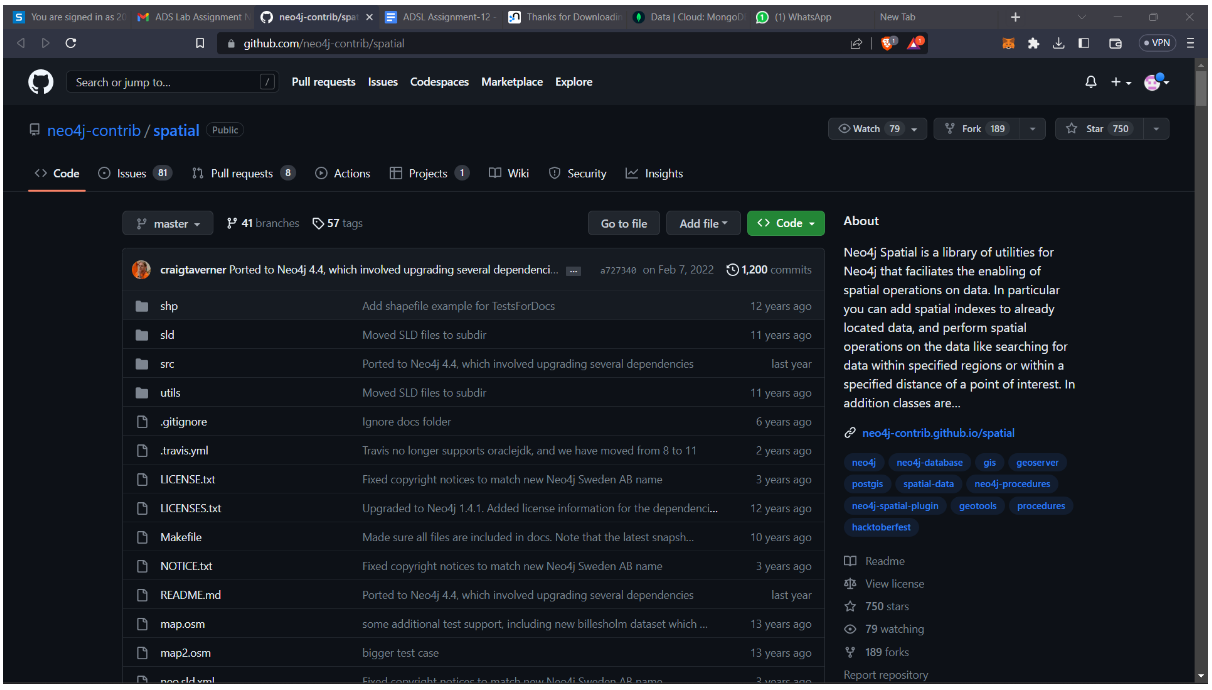
Name: Prathamesh Raje

Procedure:

1. **Install/configure Neo4jSpatial (https://github.com/neo4jcontrib/spatial) from GitHub. It is the Neo4j plug-in that facilitates geospatial operations on data stored in Neo4j.**



github.com/neo4j-contrib/spatial

neo4j-contrib / spatial

41 branches 57 tags

craigtaverner Ported to Neo4j 4.4, which involved upgrading several dependenci... a727340 on Feb 7, 2022 1,200 commits

shp	Add shapefile example for TestsForDocs	12 years ago
sld	Moved SLD files to subdir	11 years ago
src	Ported to Neo4j 4.4, which involved upgrading several dependencies	last year
utils	Moved SLD files to subdir	11 years ago
.gitignore	Ignore docs folder	6 years ago
.travis.yml	Travis no longer supports oraclejdk, and we have moved from 8 to 11	2 years ago
LICENSE.txt	Fixed copyright notices to match new Neo4j Sweden AB name	3 years ago
LICENSES.txt	Upgraded to Neo4j 1.4.1. Added license information for the dependenci...	12 years ago
Makefile	Made sure all files are included in docs. Note that the latest snapsh...	10 years ago
NOTICE.txt	Fixed copyright notices to match new Neo4j Sweden AB name	3 years ago
README.md	Ported to Neo4j 4.4, which involved upgrading several dependencies	last year
map.osm	some additional test support, including new billesholm dataset which ...	13 years ago
map2.osm	bigger test case	13 years ago

About

Neo4j Spatial is a library of utilities for Neo4j that faciliates the enabling of spatial operations on data. In particular you can add spatial indexes to already located data, and perform spatial operations on the data like searching for data within specified regions or within a specified distance of a point of interest. In addition classes are...

neo4j-contrib.github.io/spatial

neo4j neo4j-database gis geoserver postgis spatial-data neo4j-procedures neo4j-spatial-plugin geotools procedures hacktoberfest

Readme
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750 stars
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189 forks
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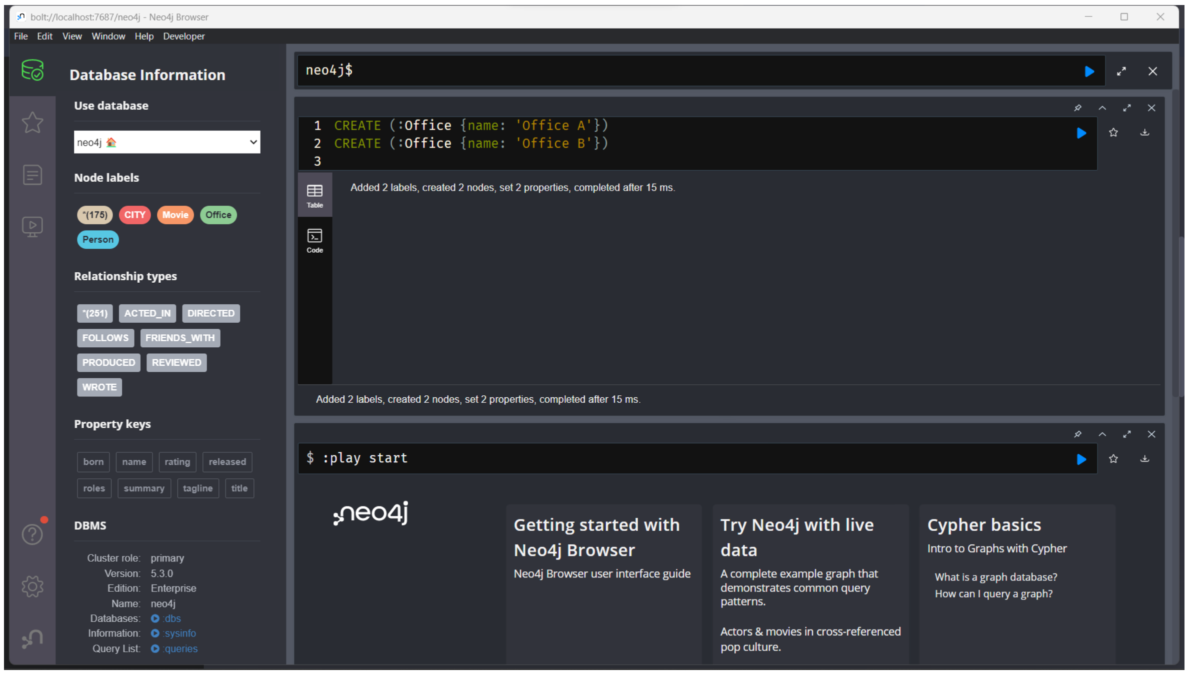
Add Offices:

```
CREATE (:Office {name: 'Office A'})
CREATE (:Office {name: 'Office B'})
```



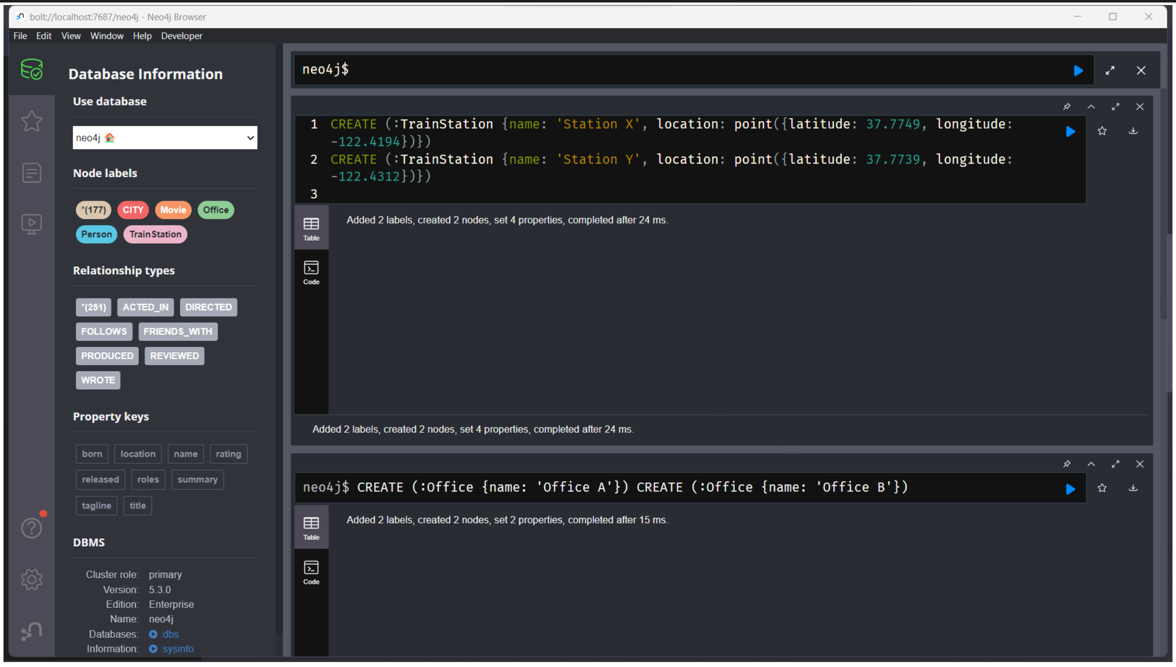
```
neo4j$
CREATE (:Office {name: 'Office A'})
CREATE (:Office {name: 'Office B'})

Added 2 labels, created 2 nodes, set 2 properties, completed after 15 ms.

Added 2 labels, created 2 nodes, set 2 properties, completed after 15 ms.

$ :play start
```

Cluster role: primary
Version: 5.3.0
Edition: Enterprise
Name: neo4j
Databases: dbs
Information: sysinfo
Query List: queries

bolt://localhost:7687/neo4j - Neo4j Browser
File Edit View Window Help Developer
Database Information
Use database
neo4j
Node labels
*(175) CITY Movie Office Person
Relationship types
*(251) ACTED_IN DIRECTED FOLLOWS FRIENDS_WITH PRODUCED REVIEWED WROTE
Property keys
born name rating released roles summary tagline title
DBMS
Table
Code
neo4j
Getting started with Neo4j Browser
Neo4j Browser user interface guide
Try Neo4j with live data
A complete example graph that demonstrates common query patterns.
Actors & movies in cross-referenced pop culture.
Cypher basics
Intro to Graphs with Cypher
What is a graph database?
How can I query a graph?

Add TrainStations

```
CREATE (:TrainStation {name: 'Station X', location: point({latitude: 37.7749, longitude: -122.4194})}) CREATE (:TrainStation {name: 'Station Y', location: point({latitude: 37.7739, longitude: -122.4312})})
```

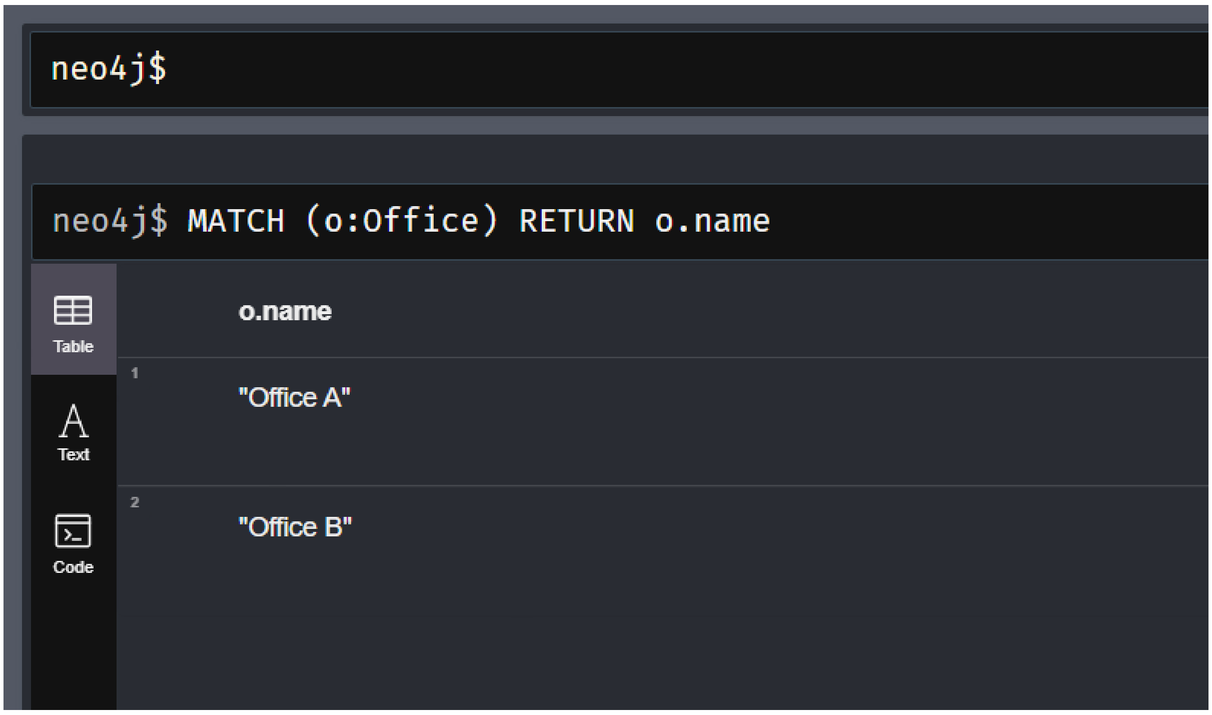


```
neo4j$
CREATE (:TrainStation {name: 'Station X', location: point({latitude: 37.7749, longitude:
-122.4194})})
CREATE (:TrainStation {name: 'Station Y', location: point({latitude: 37.7739, longitude:
-122.4312})})

Added 2 labels, created 2 nodes, set 4 properties, completed after 24 ms.

Added 2 labels, created 2 nodes, set 4 properties, completed after 24 ms.

neo4j$ CREATE (:Office {name: 'Office A'}) CREATE (:Office {name: 'Office B'})

Added 2 labels, created 2 nodes, set 2 properties, completed after 15 ms.
```

Cluster role: primary
Version: 5.3.0
Edition: Enterprise
Name: neo4j
Databases: dbs
Information: sysinfo

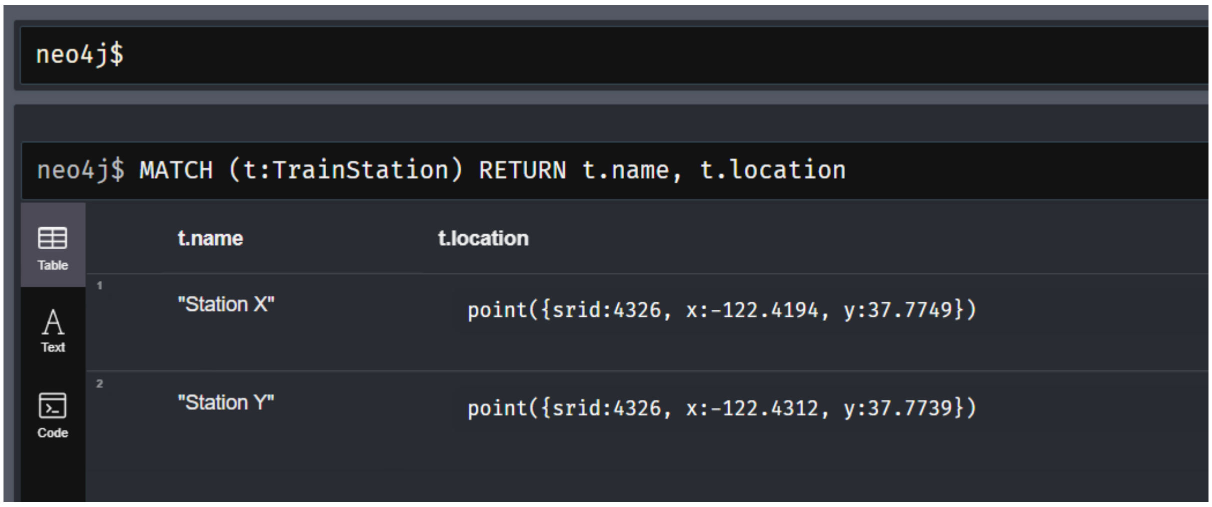
bolt://localhost:7687/neo4j - Neo4j Browser
File Edit View Window Help Developer
Database Information
Use database
neo4j
Node labels
*(177) CITY Movie Office Person TrainStation
Relationship types
*(251) ACTED_IN DIRECTED FOLLOWS FRIENDS_WITH PRODUCED REVIEWED WROTE
Property keys
born location name rating released roles summary tagline title
DBMS
Table
Code

List of TrainStations and Offices



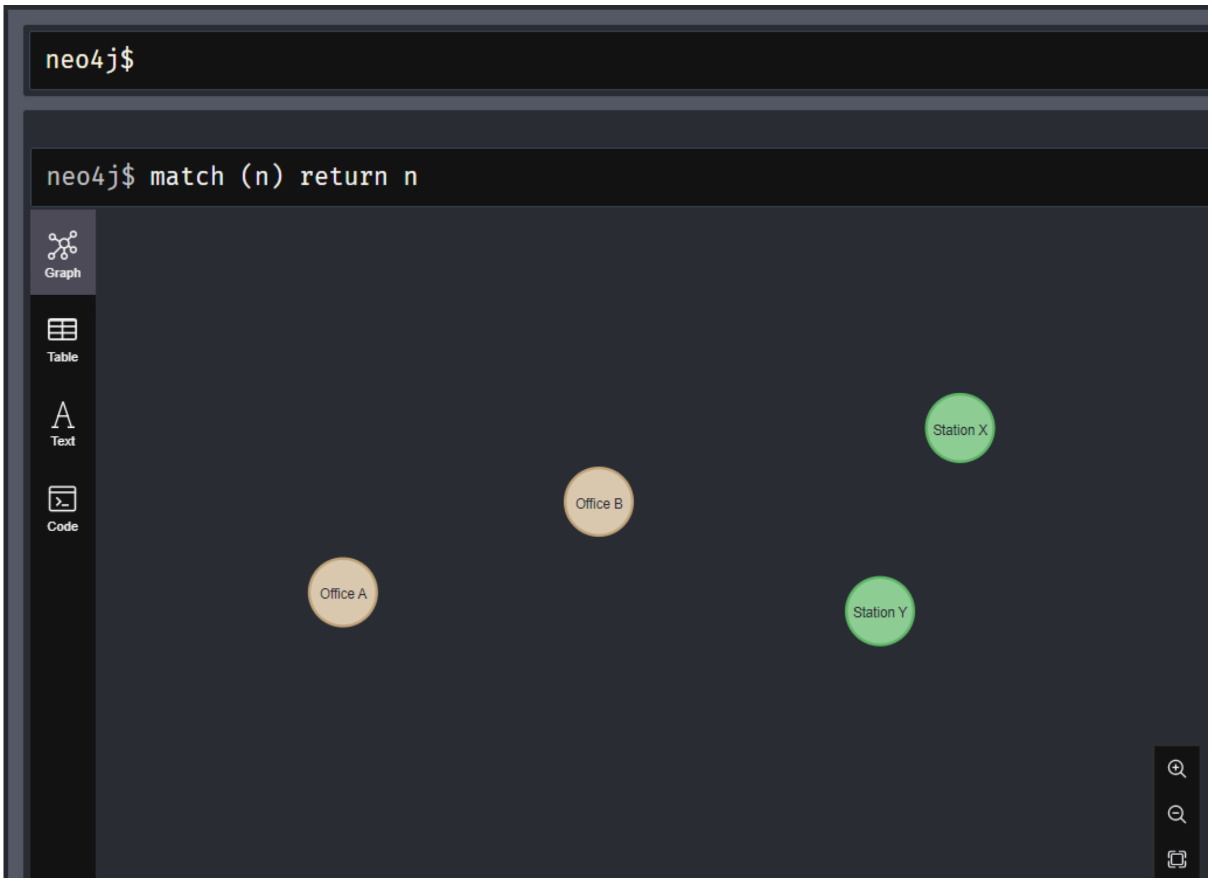
```
neo4j$

neo4j$ MATCH (o:Office) RETURN o.name
```

	o.name
1	"Office A"
2	"Office B"



```
neo4j$

neo4j$ MATCH (t:TrainStation) RETURN t.name, t.location
```

	t.name	t.location
1	"Station X"	point({srid:4326, x:-122.4194, y:37.7749})
2	"Station Y"	point({srid:4326, x:-122.4312, y:37.7739})

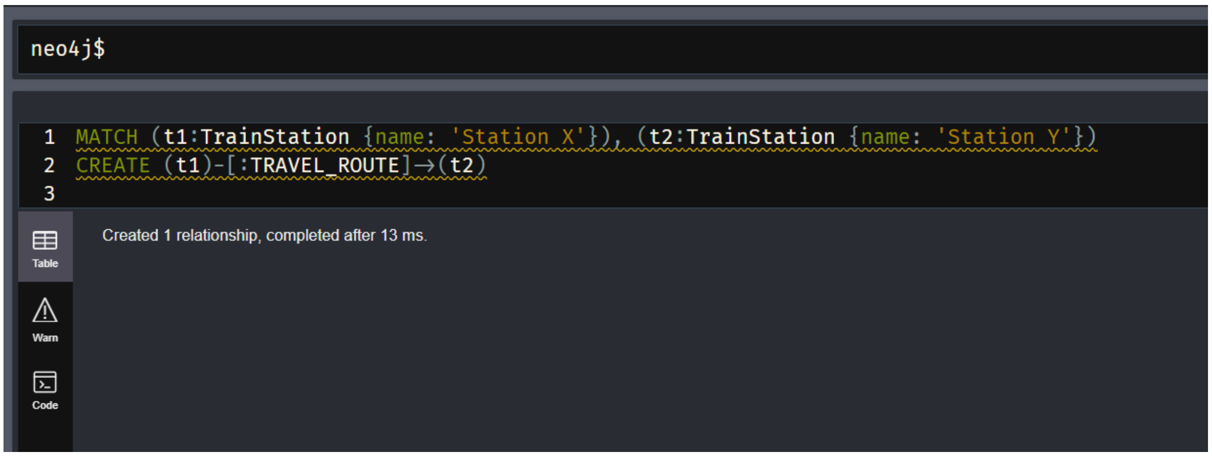


```
neo4j$
```

```
neo4j$ match (n) return n
```

Establish Relationship

```
MATCH (t1:TrainStation {name: 'Station X'}), (t2:TrainStation {name: 'Station Y'})
CREATE (t1)-[:TRAVEL_ROUTE]->(t2)
```



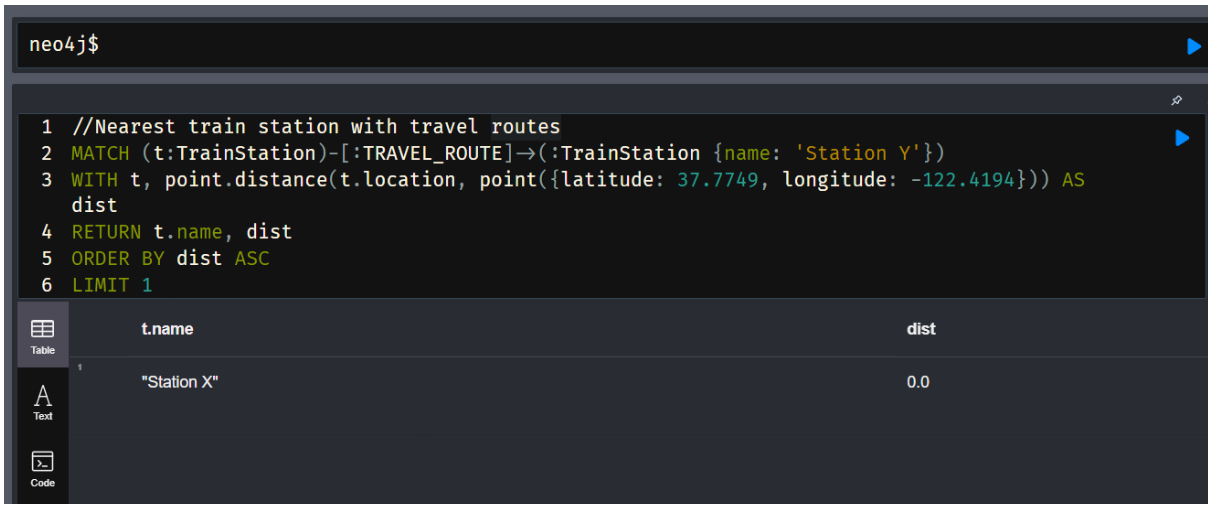
```
neo4j$
```

```
MATCH (t1:TrainStation {name: 'Station X'}), (t2:TrainStation {name: 'Station Y'})
CREATE (t1)-[:TRAVEL_ROUTE]→(t2)
```

```
Created 1 relationship, completed after 13 ms.
```

Nearest train station and office with or without travel routes:

```
//Nearest train station with travel routes
MATCH (t:TrainStation)-[:TRAVEL_ROUTE]->(:TrainStation {name:
'Station Y'})
WITH t, point.distance(t.location, point({latitude: 37.7749, longitude:
-122.4194})) AS dist
RETURN t.name, dist
ORDER BY dist ASC
LIMIT 1
```



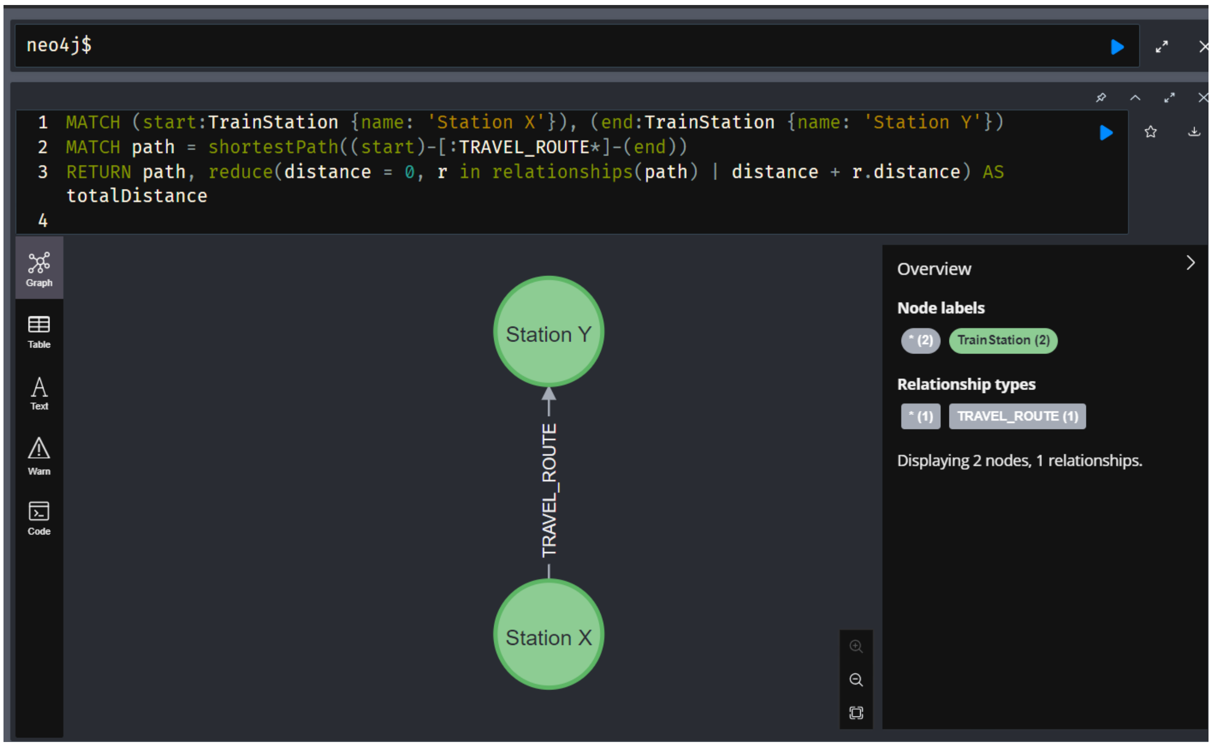
```
neo4j$
```

```
//Nearest train station with travel routes
MATCH (t:TrainStation)-[:TRAVEL_ROUTE]→(:TrainStation {name: 'Station Y'})
WITH t, point.distance(t.location, point({latitude: 37.7749, longitude: -122.4194})) AS
dist
RETURN t.name, dist
ORDER BY dist ASC
LIMIT 1
```

	t.name	dist
1	"Station X"	0.0

Shortest Distance Between two train stations:

```
MATCH (start:TrainStation {name: 'Station X'}), (end:TrainStation {name:
'Station Y'})
MATCH path = shortestPath((start)-[:TRAVEL_ROUTE*]-(end))
RETURN path, reduce(distance = 0, r in relationships(path) | distance +
r.distance) AS totalDistance
```



```
neo4j$
```

```
MATCH (start:TrainStation {name: 'Station X'}), (end:TrainStation {name: 'Station Y'})
MATCH path = shortestPath((start)-[:TRAVEL_ROUTE*]-(end))
RETURN path, reduce(distance = 0, r in relationships(path) | distance + r.distance) AS
totalDistance
```

Overview

Node labels

* (2) TrainStation (2)

Relationship types

* (1) TRAVEL_ROUTE (1)

Displaying 2 nodes, 1 relationships.