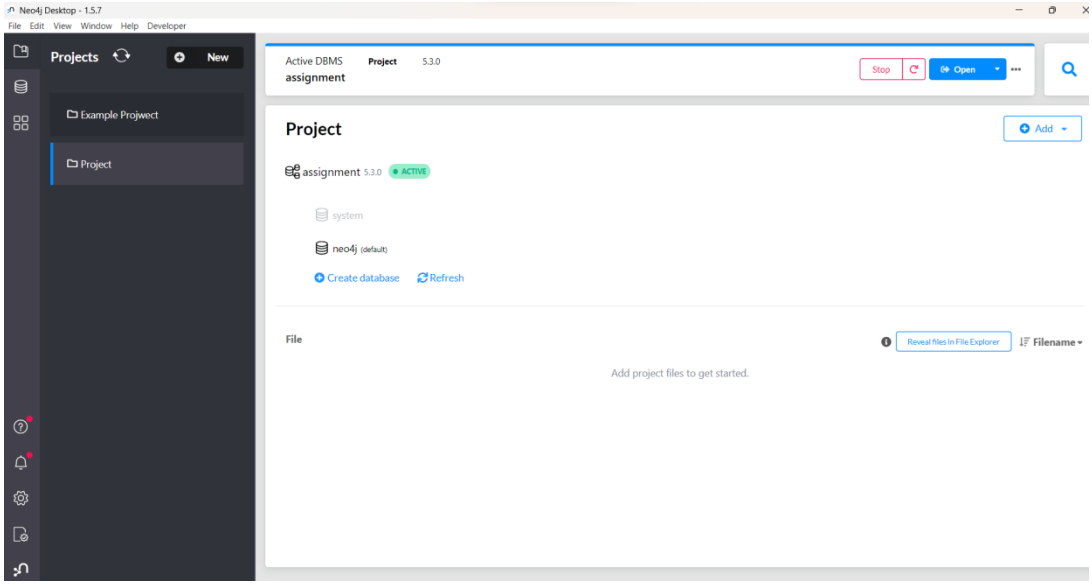
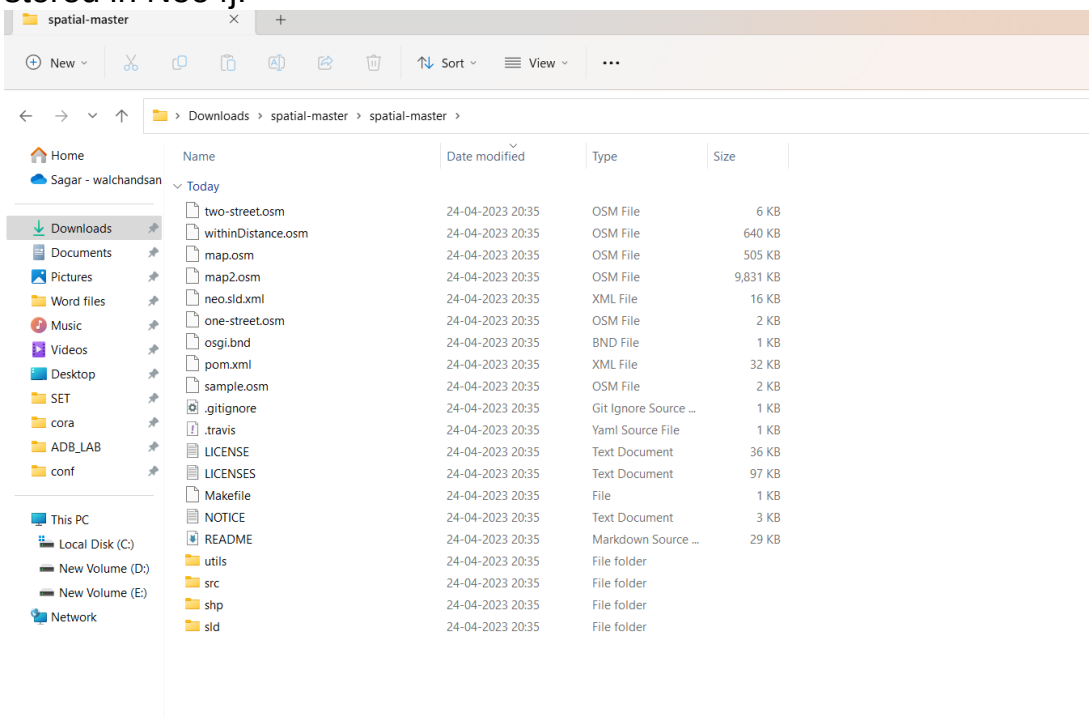
Name : Tushar Rajendra Patil
PRN:2020BTECS00075
ADS Assignment :12

Task :

1. Use Neo4j graph database installed in previous assignments.



2. 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.



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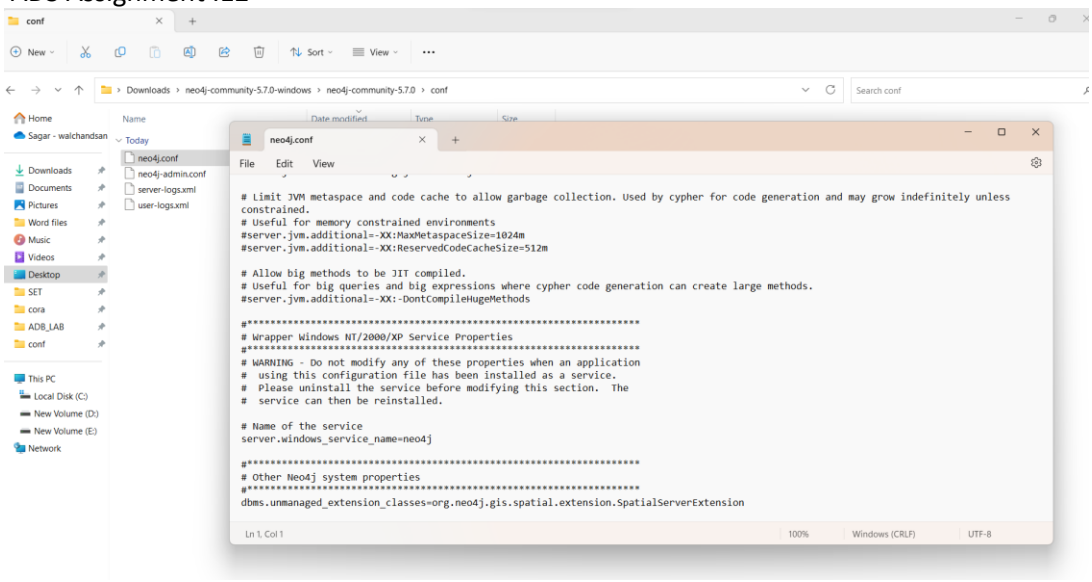
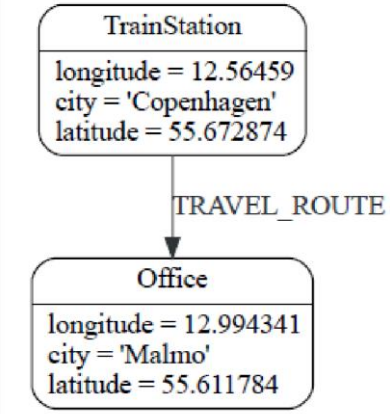


3. Write CQL (Cypher Query Language) script to add randomly 10,000 location points as follows. Assume any data.



Cypher script :

// Create 10,000 Train Station nodes

UNWIND range(1, 10000) AS i CREATE (:TrainStation {location: point({latitude: 55.672874 + rand()*0.5, longitude: 12.56459 + rand()*0.5}), city: 'Copenhagen'});

// Create 10,000 Office nodes

UNWIND range(1, 10000) AS i CREATE (:Office {location: point({latitude: 55.611784 + rand()*0.5, longitude: 12.994341 + rand()*0.5}), city: 'Malmo'});

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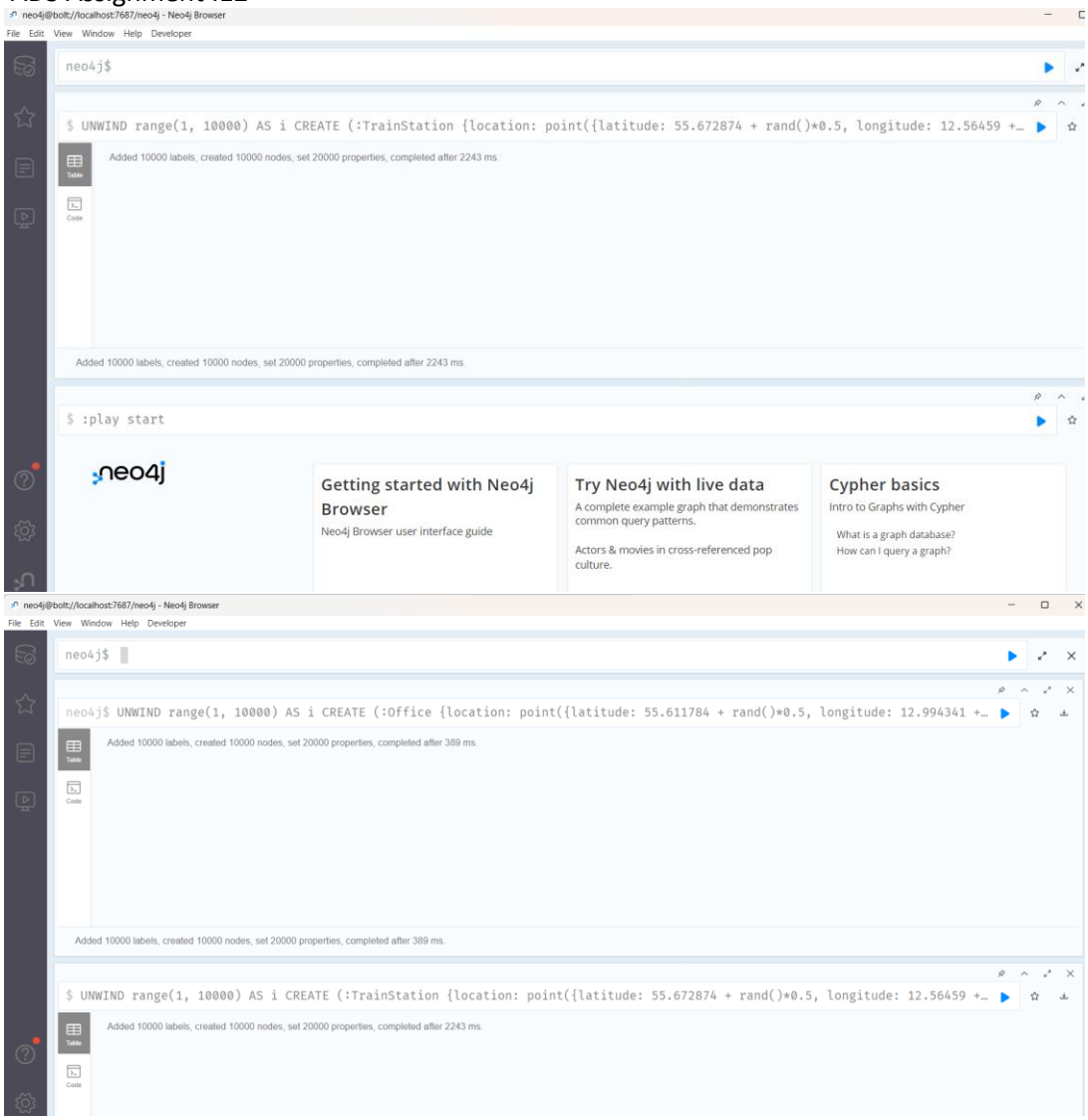

4. Use the point() , distance() function of Neo4j to answer the queries "***which things close/nearest to which other things***".

5. Demonstrate the result by firing different cypher queries (write CQL statement).

1. Find the nearest train station to each office in Malmo:

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```
MATCH (o:Office {city: 'Malmo'})
MATCH (t:TrainStation {city : 'Copenhagen'})
RETURN o, t
ORDER BY point.distance(o.location, t.location)
LIMIT 100
```

"o"	"t"
{"city":"Malmo","location":point({srid:4326, x:13.063043476068604, y:55.996309055409554})}	{"city":"Copenhagen","location":point({srid:4326, x:, y:55.99628768343435})}
{"city":"Malmo","location":point({srid:4326, x:13.053734482993239, y:56.065640449304524})}	{"city":"Copenhagen","location":point({srid:4326, x: y:56.06567440454799})}
{"city":"Malmo","location":point({srid:4326, x:13.015230293528038, y:55.91766638585357})}	{"city":"Copenhagen","location":point({srid:4326, x:, y:55.917648393052076})}
{"city":"Malmo","location":point({srid:4326, x:13.001944230188279, y:55.97854796274149})}	{"city":"Copenhagen","location":point({srid:4326, x:, y:55.97853468995697})}
{"city":"Malmo","location":point({srid:4326, x:13.054176925479467, y:55.75785220536081})}	{"city":"Copenhagen","location":point({srid:4326, x:, y:55.757913149456})}
{"city":"Malmo","location":point({srid:4326, x:13.050004412692276, y:55.790506754984555})}	{"city":"Copenhagen","location":point({srid:4326, x:, y:55.79057239233757})}
{"city":"Malmo","location":point({srid:4326, x:13.036257761110384, y:5	{"city":"Copenhagen","location":point({srid:4326, x:

2. Find the closest Office to each Train Station in Copenhagen:

```
MATCH (t:TrainStation {city: 'Copenhagen'})
MATCH (o:Office {city : 'Malmo'})
RETURN t, o
ORDER BY point.distance(t.location, o.location)
LIMIT 50
```

{"city":"Copenhagen","location":point({srid:4326, x:13.05098293028284, y:55.680240960836})}	{"city":"Malmo","location":point({srid:4326, x:13.05 5.67995982611531})}
{"city":"Copenhagen","location":point({srid:4326, x:13.00407679750133, y:55.72997446547808})}	{"city":"Malmo","location":point({srid:4326, x:13.00 5.73000934254134})}
{"city":"Copenhagen","location":point({srid:4326, x:12.99932807581581, y:55.7730405928264})}	{"city":"Malmo","location":point({srid:4326, x:12.99 5.773072922469495})}
{"city":"Copenhagen","location":point({srid:4326, x:13.02250755022969, y:56.10846605291365})}	{"city":"Malmo","location":point({srid:4326, x:13.02 6.10845069233796})}
{"city":"Copenhagen","location":point({srid:4326, x:13.051812099870006, y:55.98789375077564})}	{"city":"Malmo","location":point({srid:4326, x:13.05 5.988058250419165})}
{"city":"Copenhagen","location":point({srid:4326, x:13.043606938194472, y:55.819393431766784})}	{"city":"Malmo","location":point({srid:4326, x:13.04 5.81972370533159})}
{"city":"Copenhagen","location":point({srid:4326, x:13.019508153624312, y:55.92729143271016})}	{"city":"Malmo","location":point({srid:4326, x:13.01 5.92694784878002})}

3. Find the closest Office to each other Office in Malmo.

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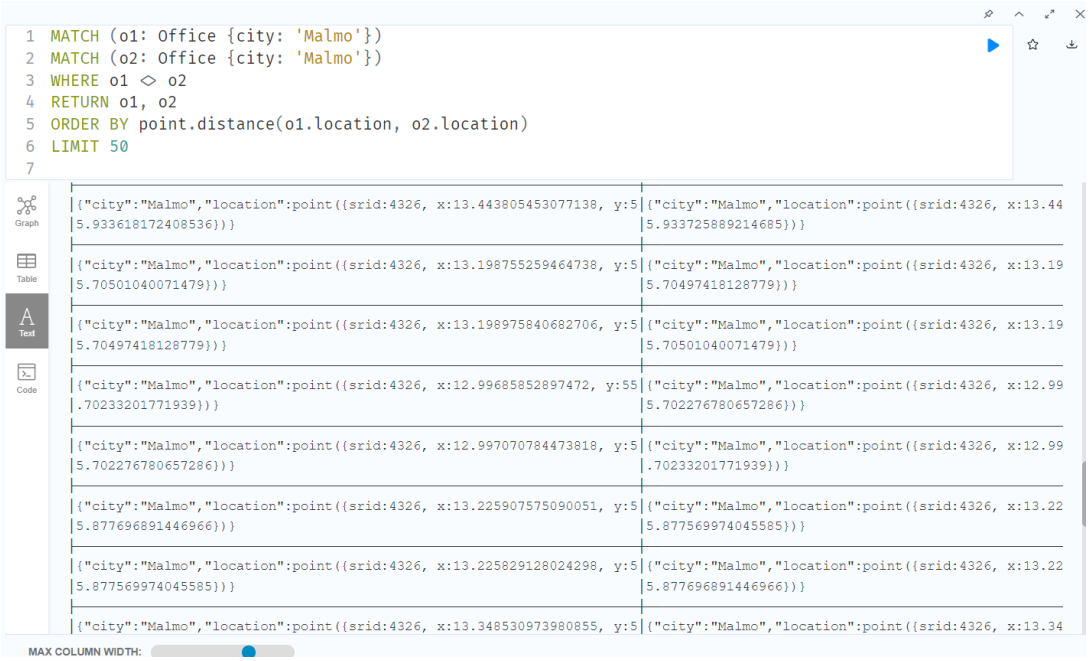

```
MATCH (o1: Office {city: 'Malmo'})
MATCH (o2: Office {city: 'Malmo'})
WHERE o1 <> o2
RETURN o1, o2
ORDER BY point.distance(o1.location, o2.location)
LIMIT 50
```

{"city":"Malmo","location":point({srid:4326, x:13.443805453077138, y:5	{"city":"Malmo","location":point({srid:4326, x:13.44
5.933618172408536})}	5.933725889214685})}
{"city":"Malmo","location":point({srid:4326, x:13.198755259464738, y:5	{"city":"Malmo","location":point({srid:4326, x:13.19
5.70501040071479})}	5.70497418128779})}
{"city":"Malmo","location":point({srid:4326, x:13.198975840682706, y:5	{"city":"Malmo","location":point({srid:4326, x:13.19
5.70497418128779})}	5.70501040071479})}
{"city":"Malmo","location":point({srid:4326, x:12.99685852897472, y:55	{"city":"Malmo","location":point({srid:4326, x:12.99
.70233201771939})}	5.702276780657286})}
{"city":"Malmo","location":point({srid:4326, x:12.997070784473818, y:5	{"city":"Malmo","location":point({srid:4326, x:12.99
5.702276780657286})}	.70233201771939})}
{"city":"Malmo","location":point({srid:4326, x:13.225907575090051, y:5	{"city":"Malmo","location":point({srid:4326, x:13.22
5.877696891446966})}	5.877569974045585})}
{"city":"Malmo","location":point({srid:4326, x:13.225829128024298, y:5	{"city":"Malmo","location":point({srid:4326, x:13.22
5.877569974045585})}	5.877696891446966})}
{"city":"Malmo","location":point({srid:4326, x:13.348530973980855, y:5	{"city":"Malmo","location":point({srid:4326, x:13.34

Graph
Table
Text
Code
MAX COLUMN WIDTH:

Note : Follow the submission guidelines.

Deadline : 23/04/2023

Dr. B. F. Momin
Course Coordinator