Assignment 3

PROBLEM2-TASK1

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Problem-2

Task-1

- ○ Neo4j Query and Graph Formation:
    - • For graph formation fetched the regions and parks names from the site [4]: https://parks.novascotia.ca/region/nova-scotia
    - • Created json files, one for each region, which consists of the name of the region and the park names that it contains as shown in *figure 1[3]* and *figure 2 [3]*.

Figure 1: Files containing regions and the park names:[3]

Figure 2: inside file containing region and the parks name:[3]

- • Written a java program to convert the json files of region and parks name to Cypher query.

- Written the queries to the "Neo4j_ParksDataAndQueries/RegionParkQueries/RegionParkQueries.txt" file as shown in *figure 3*.


```
🔒 ssh.cloud.google.com/projects/tribal-quasar-316422/zones/us-central1-a/instances/assignment3-data-ms?useAc

CREATE (P11:Park {name: 'Ben Eoin', region: 'Cape Breton Island '})
CREATE (P12:Park {name: 'Burnt Island', region: 'Cape Breton Island '})
CREATE (P13:Park {name: 'Cabots Landing', region: 'Cape Breton Island '})
CREATE (P14:Park {name: 'Cape Smokey', region: 'Cape Breton Island '})
CREATE (P15:Park {name: 'Dalem Lake', region: 'Cape Breton Island '})
CREATE (P16:Park {name: 'Dominion Beach', region: 'Cape Breton Island '})
CREATE (P17:Park {name: 'Dundee', region: 'Cape Breton Island '})
CREATE (P18:Park {name: 'Groves Point', region: 'Cape Breton Island '})
CREATE (P19:Park {name: 'Irish Cove', region: 'Cape Breton Island '})
CREATE (P20:Park {name: 'Lake O Law', region: 'Cape Breton Island '})


CREATE (R3:Region {name: 'Fundy Shore and Annapolis Valley'})
CREATE (P21:Park {name: 'Annapolis Basin Look Off', region: 'Fundy Shore and Annapolis Valley'})
CREATE (P22:Park {name: 'Anthony', region: 'Fundy Shore and Annapolis Valley'})
CREATE (P23:Park {name: 'Bell', region: 'Fundy Shore and Annapolis Valley'})
CREATE (P24:Park {name: 'Blomidon', region: 'Fundy Shore and Annapolis Valley'})
CREATE (P25:Park {name: 'Blomidon Lookoff', region: 'Fundy Shore and Annapolis Valley'})
CREATE (P26:Park {name: 'Caddell Rapids Lookoff', region: 'Fundy Shore and Annapolis Valley'})


CREATE (R4:Region {name: 'Yarmouth and Acadian Shores '})
CREATE (P27:Park {name: 'Ellenwood Lake', region: 'Yarmouth and Acadian Shores '})
CREATE (P28:Park {name: 'Glenwood', region: 'Yarmouth and Acadian Shores '})
CREATE (P29:Park {name: 'Mavillette Beach', region: 'Yarmouth and Acadian Shores '})
CREATE (P30:Park {name: 'Port Maitland Beach', region: 'Yarmouth and Acadian Shores '})
CREATE (P31:Park {name: 'Smugglers Cove', region: 'Yarmouth and Acadian Shores '})


CREATE (R5:Region {name: 'South Shore'})
CREATE (P32:Park {name: 'Bayswater Beach', region: 'South Shore'})
CREATE (P33:Park {name: 'Camerons Brook', region: 'South Shore'})
CREATE (P34:Park {name: 'Card Lake', region: 'South Shore'})
CREATE (P35:Park {name: 'Cleveland Beach', region: 'South Shore'})
CREATE (P36:Park {name: 'Cookville', region: 'South Shore'})
CREATE (P37:Park {name: 'East River', region: 'South Shore'})


CREATE (R6:Region {name: 'Eastern Shore '})
CREATE (P38:Park {name: 'Black Duck Cove', region: 'Eastern Shore '})
CREATE (P39:Park {name: 'Boylston', region: 'Eastern Shore '})
CREATE (P40:Park {name: 'Clam Harbour Beach', region: 'Eastern Shore '})
CREATE (P41:Park {name: 'Cole Harbour Heritage Park', region: 'Eastern Shore '})
CREATE (P42:Park {name: 'Dollar Lake', region: 'Eastern Shore '})


CREATE (R7:Region {name: 'Northumberland Shore '})
CREATE (P43:Park {name: 'Amherst Shore', region: 'Northumberland Shore '})
CREATE (P44:Park {name: 'Arisaig', region: 'Northumberland Shore '})
CREATE (P45:Park {name: 'Balmoral Mills', region: 'Northumberland Shore '})
CREATE (P46:Park {name: 'Bayfield Beach', region: 'Northumberland Shore '})
CREATE (P47:Park {name: 'Beaver Mountain', region: 'Northumberland Shore '})
CREATE (P48:Park {name: 'Blue Sea Beach', region: 'Northumberland Shore '})
CREATE (P49:Park {name: 'Caribou-Munroes Island', region: 'Northumberland Shore '})
CREATE (P50:Park {name: 'Fox Harbour', region: 'Northumberland Shore '})
```

Figure 3: CYPHER Create Queries of nodes generated using java code:[3]

- The queries are run on Neo4j application and output as shown in *figure 4 [1]*:
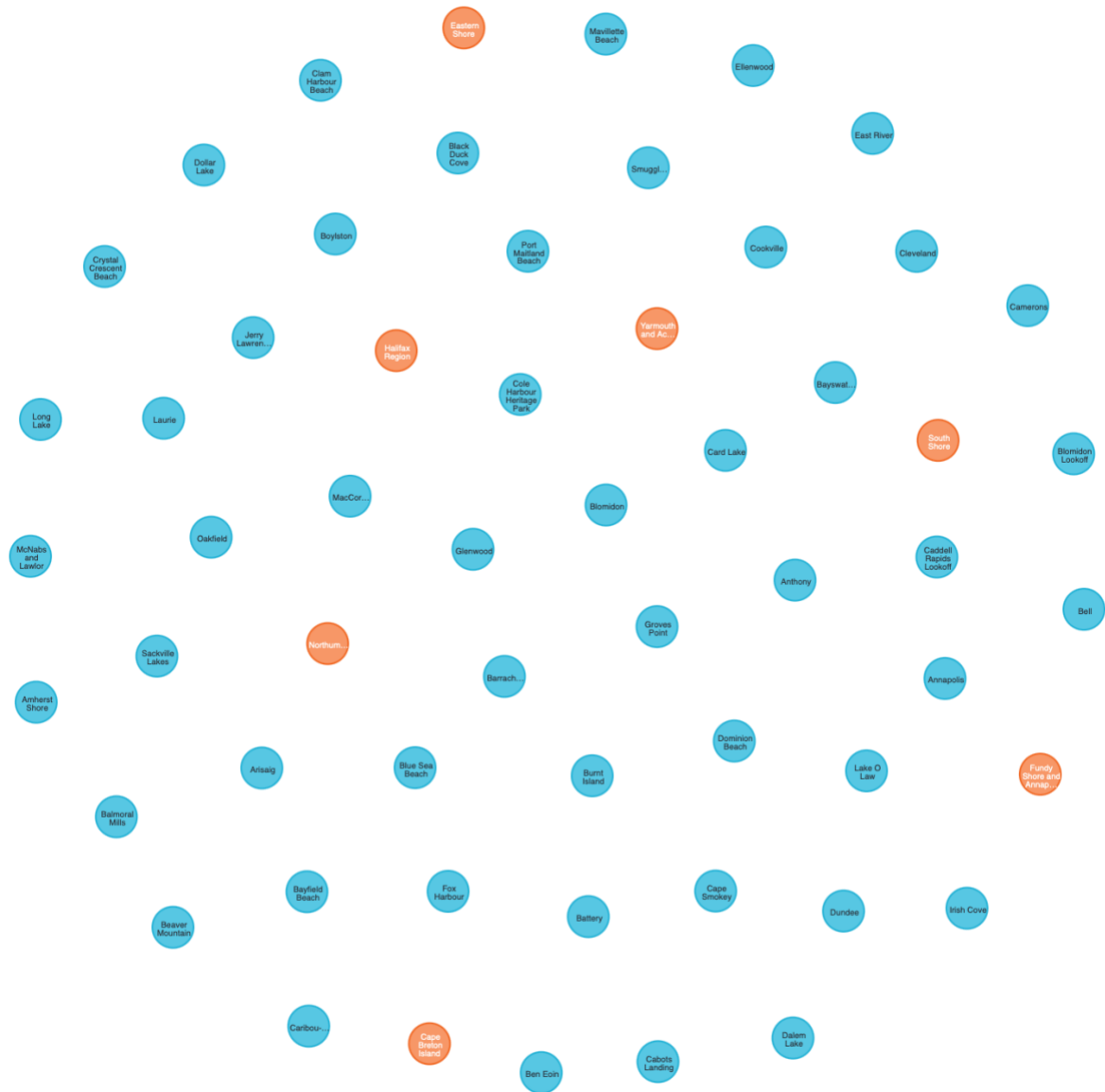
Figure 4 : All nodes of Region and Parks created [1]

- To make the relations following commands were used:
  - match(p:Park), (r:Region) where p.region=r.name create (p) - [:inside] -> (r)
  - match(p:Park), (r:Region) where p.region=r.name create (r) - [:contains] -> (p)
  - Output is as shown in *figure 5[1]* and *figure 6 [1]*.
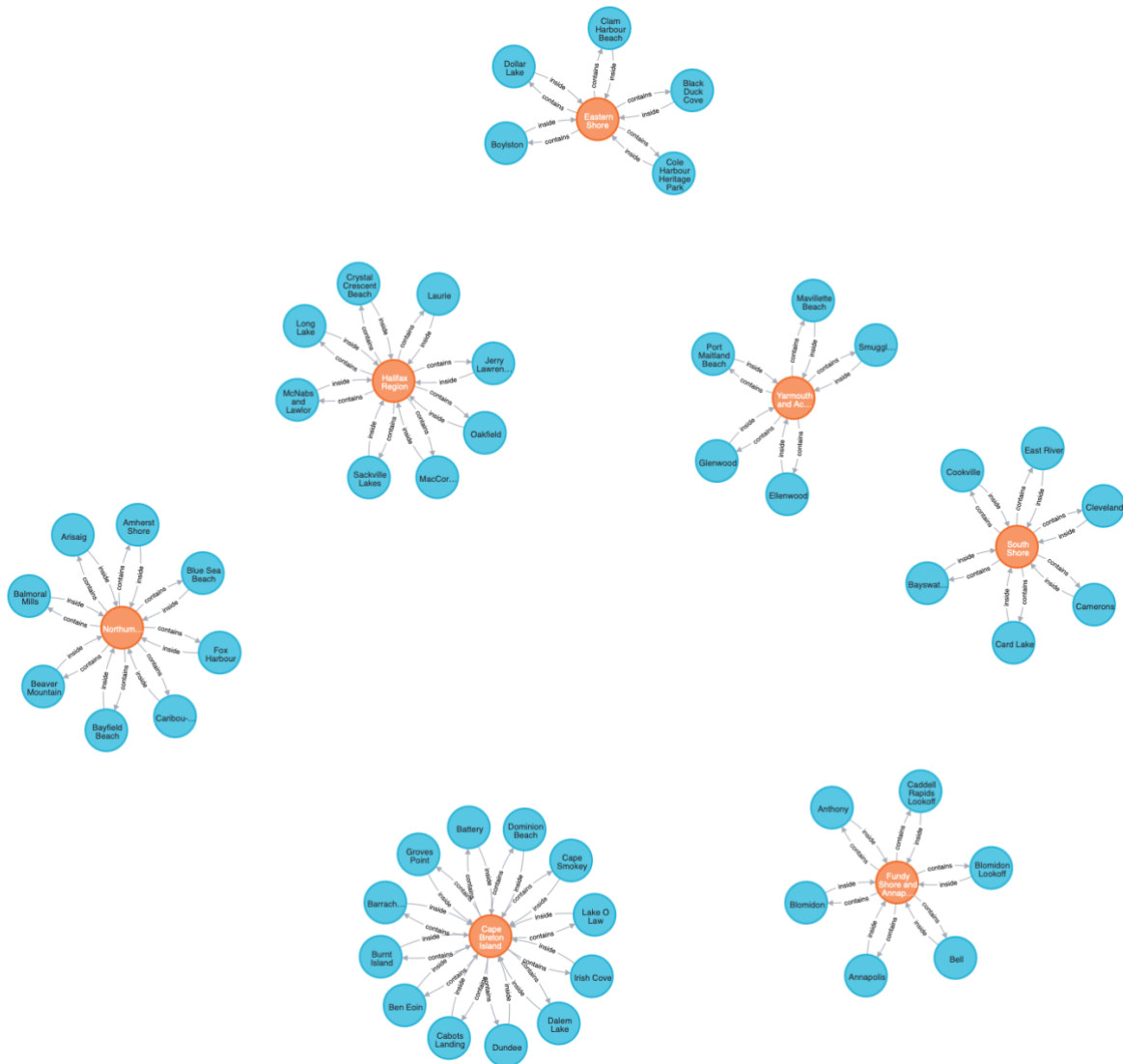
Figure 5 : Parks and Regions relation created: [1]

- Relation between all the regions were created with below command:
  - match (r1:Region), (r2:Region) where r1.name <> r2.name create (r1) - [:internal] -> (r2)
  - output is as shown in *figure 7 [1]*:

Figure 7: complete Graph with all the Relations: [1]

- For Getting the count of parks in the region below queries were used:
  - match (r: Region)
    with (r), Size((r) - [:contains] -> ()) as total_Connections
    order by total_Connections DESC
    return r.name, total_Connections
  - Output is as shown in *figure 8 [1]*:

  - match (r: Region)
    with (r), Size((r) - [:contains] -> ()) as total_Connections
    order by total_Connections DESC limit 1
    return r.name, total_Connections
  - Output is as shown in *figure 9 [1]*:

```
eo4j$ match (r: Region) with (r), Size( (r) - [:contains] → ()) as total_Connections order by total_Connections DES…
```

r.name	total_Connections
"Cape Breton Island "	12
"Halifax Region"	8
"Northumberland Shore "	8
"Fundy Shore and Annapolis Valley"	6
"South Shore"	6
"Yarmouth and Acadian Shores "	5
"Eastern Shore "	5

Figure 8: Count of Parks in the regions: [1]

```
eo4j$ match (r: Region) with (r), Size( (r) - [:contains] → ()) as total_Connections order by total_Connections DES…
```

r.name	total_Connections
"Cape Breton Island "	12

Figure 9: Region with Maximum number of parks: [1]

References

[1] 3f662e59a28df76a83737b92ab023e23.neo4jsandbox.com. 2021. *Neo4j Browser*. [online] Available at: <https://3f662e59a28df76a83737b92ab023e23.neo4jsandbox.com/browser/#pwfetch:3f662e59a28df76a83737b92ab023e23:eyJhbGciOiJSUzI1NiIsInR5cCI6IkpXVCIsImtpZCI6IlFUbENPRVV4UmtJNFJETkROakpETXpBME5EZzBRelV3UWpNek9UVTVNRFF4TlRKRRk56STJOZyJ9.eyJpc3MiOiJodHRwczovL2xvZ2luLm5lbzRqLmNvbS8iLCJzdWIiOiJhdXRoMHw2MGUyNTA5YTFiN2NiMTAwNjk2NWM1MzgiLCJhdWQiOlsibnVvNGo6Ly9hY2NvdW50aW5mby8iLCJodHRwczovL25lbzRqLXN5bmMuYXV0aDAuY29tL3VzZXJpbmZvIl0sImlhdCI6MTYyNTQ0NDY0OSwiZXhwIjoxNjI1NTMxMDQ5LCJhenAiOiJEeEdhaUY4VENlem5JN3Fob2TA4VXlZU2NNR1puaazRrZSIsInNjb3BlIjoib3BlbmlkIHByb2ZpbGUgZW1haWwgcmVhZDphY2NvdW50LWluZm8gd3JpdGU6YWNjb3VudC1pbmZvIn0.cK79A9sPjK50xp3f8xPV0xdL_Zy42q_0mnM4TT_zkmSE-DATaaMb18PYaMlSWUCTjSyYkfQ1eDRl2kg0NfTgKZPmJESi2tXMw49Mj5tn5RDup4hsKkGhucNkY1mCA3MMKykhw15LyvvblB1QCvMPd4TIqk15d6UJuQ-1AjwC9RoUY5712jHTwFBrslsLwhtUkh96sAX9MT5EppBVzB2VKj5l4bt6L6eS-HCM5cB6V6Yec6yr8GFqETPiv10uigbaT8fdoQzvaHnd8KZSxCMdnO3ybpm3-OWLXOy5QuF5CGYrBIZ_AtZZ_VUir-5Kz_b5iY02Xjua9yQVWhAXsnmTlA> [Accessed 5 July 2021].

[2] 35.226.207.33. 2021. *Spark Master at spark://assignment3-data-ms.us-central1-a.c.tribal-quasar-316422.internal:7077*. [online] Available at: <http://35.226.207.33:8080/> [Accessed 5 July 2021].

[3] Console.cloud.google.com. 2021. *Google Cloud Platform*. [online] Available at: <https://console.cloud.google.com/compute/instancesDetail/zones/us-central1-a/instances/assignment3-data-ms?project=tribal-quasar-316422&rif_reserved> [Accessed 5 July 2021].

[4] Parks.novascotia.ca. 2021. *Find a Park | Nova Scotia Parks*. [online] Available at: <https://parks.novascotia.ca/region/nova-scotia> [Accessed 5 July 2021].

[5] Sandbox.neo4j.com. 2021. *Home - Neo4j Sandbox*. [online] Available at: <https://sandbox.neo4j.com> [Accessed 5 July 2021].