

CSCI 5408

ASSIGNMENT – 3

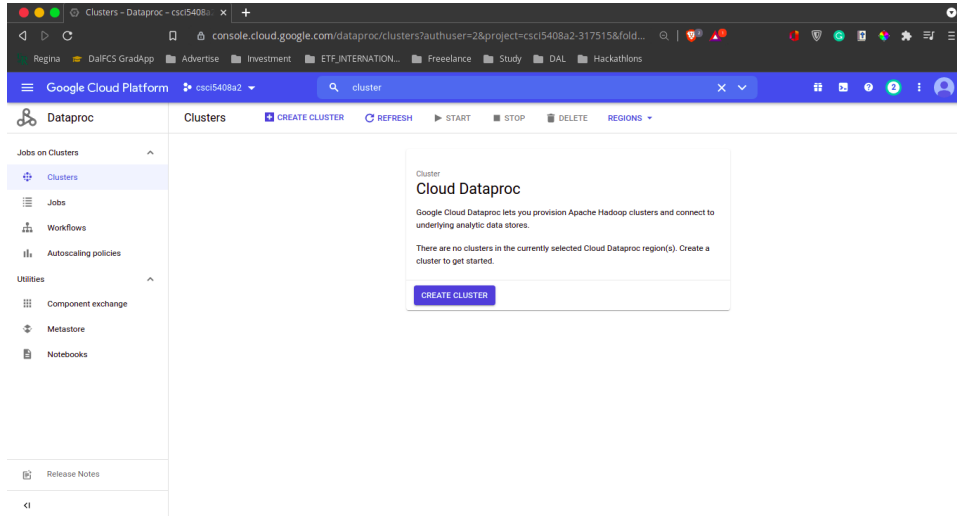
SUBMITTED BY: DHRUV DOSHI

GIT LINK <https://git.cs.dal.ca/doshi/csci-5408-s2021-b00883311-dhruv-doshi/-/tree/master/A3/code>

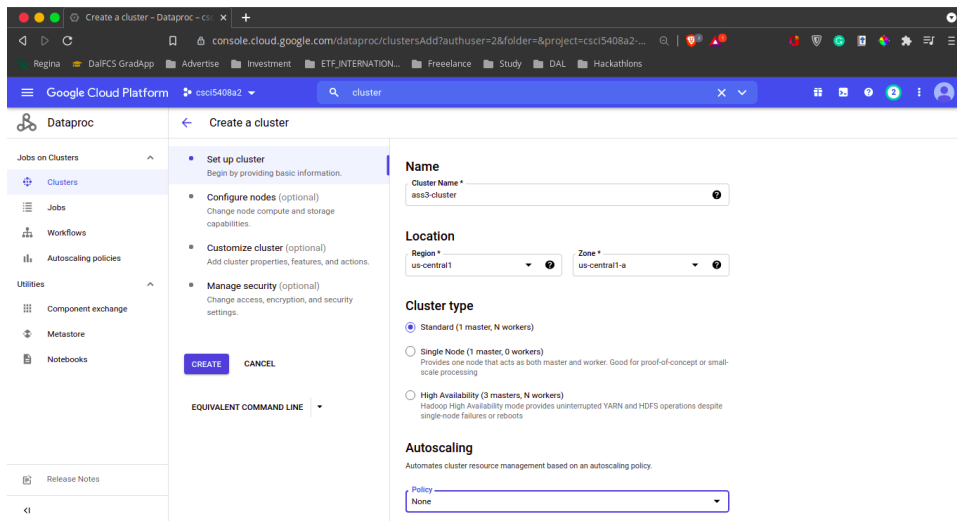
PROBLEM 1

PART 1

STARTING TO MAKE THE CLUSTER



NAMING THE CLUSTER AND SELECTING REGION



Create a cluster - Dataproc - console.cloud.google.com/dataproc/clustersAdd?authuser=2&folder=8project=csi5408a2...

Create a cluster

Jobs on Clusters

Clusters

Jobs

Workflows

Autoscaling policies

Utilities

Component exchange

Metastore

Notebooks

Release Notes

<1

Set up cluster

Begin by providing basic information.

Configure nodes (optional)

Change node compute and storage capabilities.

Customize cluster (optional)

Add cluster properties, features, and actions.

Manage security (optional)

Change access, encryption, and security settings.

CREATE

CANCEL

EQUIVALENT COMMAND LINE

Enhanced Flexibility Mode

Dataproc Enhanced Flexibility Mode (EFM) manages shuffle data to minimize job progress delays caused by the removal of nodes from a running cluster. EFM offloads shuffle data in one of two user-selectable modes, primary worker shuffle and Hadoop Compatible File System (HCFS) shuffle. [Learn more](#)

An autoscaling policy must be selected to configure EFM.

Versioning

Use a custom image to load pre-installed packages. [Learn more](#)

Image Type and Version

2.0-debian10

Release Date

First released on 1/22/2021.

CHANGE

Components

Component Gateway

☒ Enable component gateway

Provides access to the web interfaces of default and selected optional components on the cluster. [Learn more](#)

Optional components

Google Cloud Platform - VM Instance details - console.cloud.google.com/compute/instancesDetail/zones/us-central1-a/instances/ass3-cl...

VM Instance details

Virtual machines

VM instances

Instance templates

Sole-tenant nodes

Machine images

TPUs

Committed use discounts

Migrate for Compute Engi...

Storage

Disks

Snapshots

Marketplace

Release Notes

<1

ass3-cluster-m

Details

Observability

NEW

Screenshot

Remote access

SSH

Connect to serial console

Enable connecting to serial ports

Logs

Cloud Logging

Serial port 1 (console)

More

Instance ID

7174544332003421699

Machine type

n1-standard-4 (4 vCPUs, 15 GB memory)

Reservation

Automatically choose (default)

CPU platform

Intel Haswell

Display device

Turn on a display device if you want to use screen capturing and recording tools.

Turn on display device

Zone

us-central1-a

1 vCPUs

Google Cloud Platform - Cluster details - console.cloud.google.com/dataproc/clusters/ass3-cluster/configuration?region=us-central1...

Cluster details

Jobs on Clusters

Clusters

Jobs

Workflows

Autoscaling policies

Utilities

Component exchange

Metastore

Notebooks

Release Notes

<1

Cluster details

SUBMIT JOB

REFRESH

START

STOP

DELETE

VIEW LOGS

zone

us-central1-a

Autoscaling

Off

Dataproc Metastore

None

Scheduled deletion

Off

Master node

Standard (1 master, N workers)

Machine type

n1-standard-4

Number of GPUs

0

Primary disk type

pd-standard

Primary disk size

500GB

Local SSDs

0

Worker nodes

2

Machine type

n1-standard-4

Number of GPUs

0

Primary disk type

pd-standard

Primary disk size

500GB

Local SSDs

0

Secondary worker nodes

0

Secure Boot

Disabled

VTM

Disabled

Integrity Monitoring

Disabled

Cloud Storage staging bucket

dataproc-staging-us-central1-547709120259-@rgans

Network

default

Network tags

None

Internal IP only

No

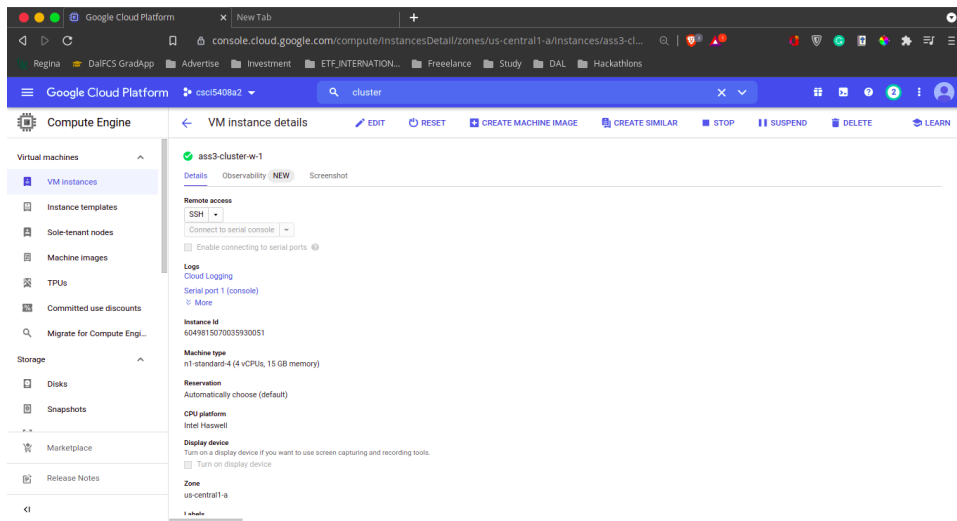
Image version

2.0.12-debian10

Google Cloud Platform console showing VM instances. The left sidebar lists navigation options: Virtual machines, VM instances, Instance templates, Sole-tenant nodes, Machine images, TPUs, Committed use discounts, Migrate for Compute Engi..., Storage, Disks, Snapshots, Marketplace, and Release Notes. The main content area displays a table of VM instances under the heading "INSTANCES". The table has columns for Status, Name, Zone, Recommendations, In use by, Internal IP, and External IP. Three instances are listed: ass3-cluster-m, ass3-cluster-w-0, and ass3-cluster-w-1. The right sidebar shows a "Select an instance" panel with tabs for PERMISSIONS, LABELS, and MONITORING, and a message: "Please select at least one resource."

Status	Name	Zone	Recommendations	In use by	Internal IP	External IP
<input type="checkbox"/>	ass3-cluster-m	us-central1-a			10.128.0.5 (nic0)	104.154.17.1
<input type="checkbox"/>	ass3-cluster-w-0	us-central1-a			10.128.0.6 (nic0)	35.238.114.1
<input type="checkbox"/>	ass3-cluster-w-1	us-central1-a			10.128.0.7 (nic0)	35.225.132.1

Google Cloud Platform console showing VM instance details for "ass3-cluster-w-0". The left sidebar is the same as the first screenshot. The main content area displays the "VM instance details" for the selected instance. The top bar shows the instance name "ass3-cluster-w-0" and tabs for Details, Observability, and Screenshot. The "Details" tab is active. The page includes sections for Remote access (SSH, Connect to serial console, Enable connecting to serial ports), Logs (Cloud Logging, Serial port 1 (console), More), Instance ID (622320487842442179), Machine type (n1-standard-4 (4 vCPUs, 15 GB memory)), Reservation (Automatically choose (default)), CPU platform (Intel Haswell), Display device (Turn on a display device if you want to use screen capturing and recording tools, Turn on display device), and Zone (us-central1-a).



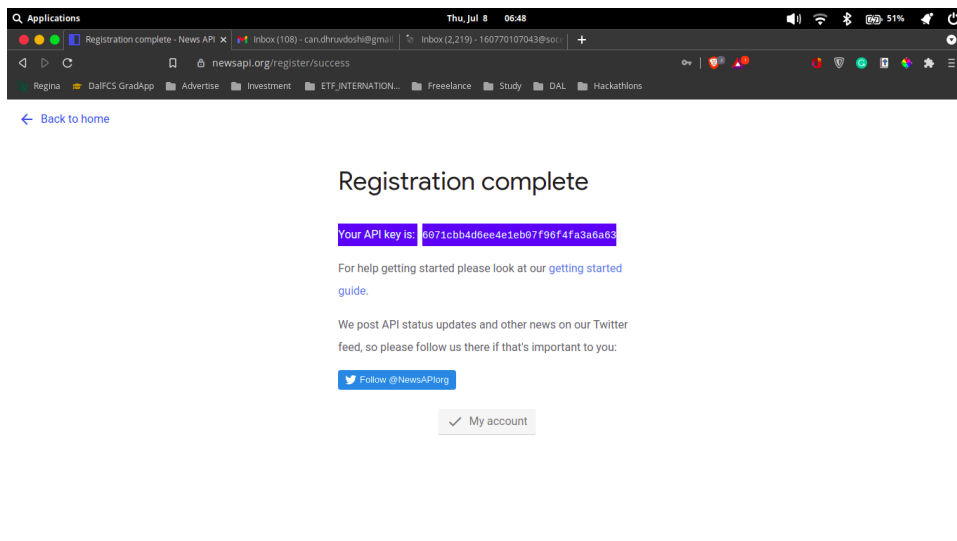
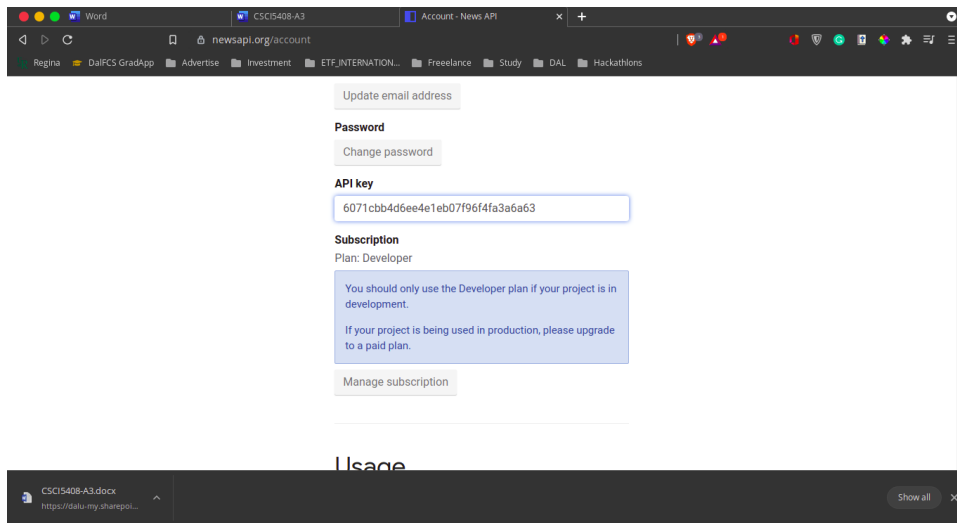
As shown in the images the Apache spark cluster is created on GCP. Here I just deployed the Cloud prop cluster which will allow us to create multiple VM's to handle data. Continuing with that we need to have three vm's which will work with the Hadoop framework. Now here we are having three vm's, ass3-cluster-m which is master VM where as another 2 VM which are ass3-cluster-w-0 and ass3-cluster-w-1.

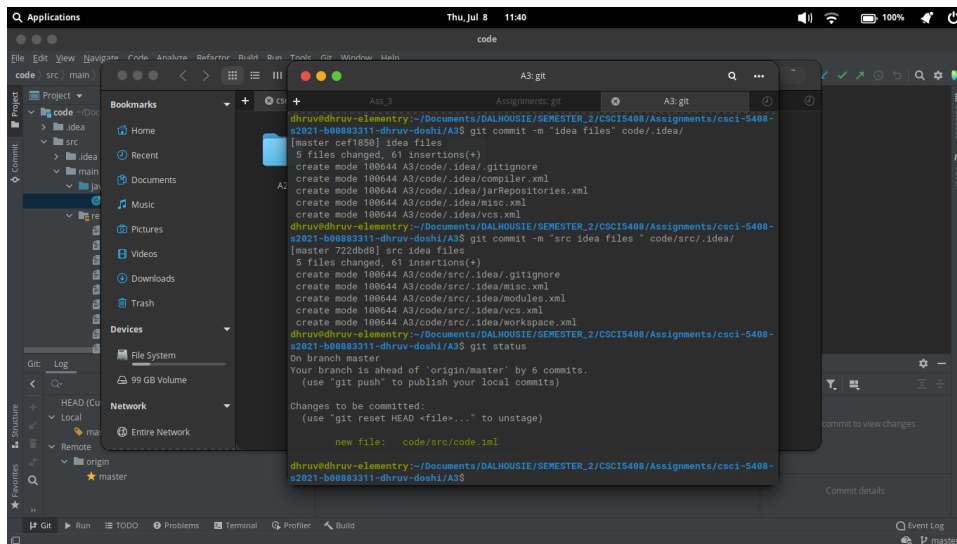
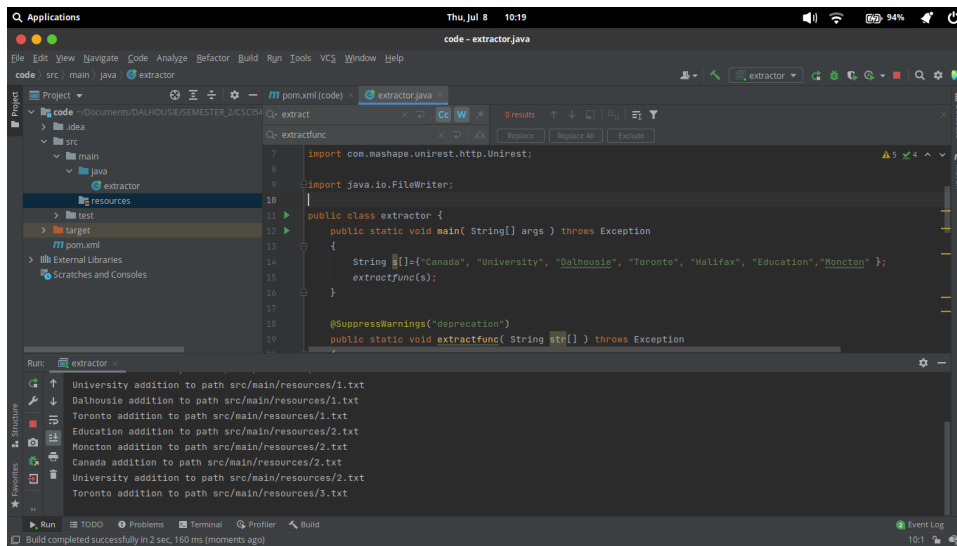
I started the Master Node and checked it by opening the URL on the browser. It was running fine. To check the proper installation of Apache spark was properly conducted.

After that with SSH I tried to work with the VM's and moved ahead with no issues. Hence I could figure that it is working completely fine.

PART 1

PROBLEM 2





CODE

```

import com.google.gson.Gson;
import com.google.gson.GsonBuilder;
import com.google.gson.JsonElement;
import com.google.gson.JsonParser;
import com.mashape.unirest.http.HttpResponse;
import com.mashape.unirest.http.JsonNode;
import com.mashape.unirest.http.Unirest;

```

```
import java.io.FileWriter;
```

```
public class extractor{  
    public static void main( String[] args ) throws Exception  
    {  
        String s[]={"Canada", "University", "Dalhousie", "Toronto", "Halifax", "Education", "Moncton"};  
        extractfunc(s);  
    }  
}
```

```
@SuppressWarnings("deprecation")  
public static void extractfunc( String str[] ) throws Exception  
{  
    String apikey = "6071cbb4d6ee4e1eb07f96f4fa3a6a63";  
    int k=0;  
    int cntr=1;  
    for(int i=0;i<75;i++)  
    {  
        for(int j=0;j<str.length;j++)  
        {  
            String address="https://newsapi.org/v2/everything?q="+str[j]+"&pageSize=1&apiKey=";  
            HttpResponse<JsonNode> response = Unirest.get(address + apikey).asJson();  
            Gson gson = new GsonBuilder().setPrettyPrinting().create();  
            JsonParser js=new JsonParser();  
            JsonElement element=js.parse(response.getBody().toString());  
            String jsonString = gson.toJson(element);  
            k++;  
        }  
    }  
}
```



```
if(k%5==0)

cntr++;

else{

FileWriter fw=new FileWriter("src/main/resources/"+Integer.toString(cntr)+".txt",true);

fw.write(jsonString);

fw.write("\r\n");

fw.close();

System.out.println(str[j]+" addition to path " + "src/main/resources/"+Integer.toString(cntr)+".txt");

}

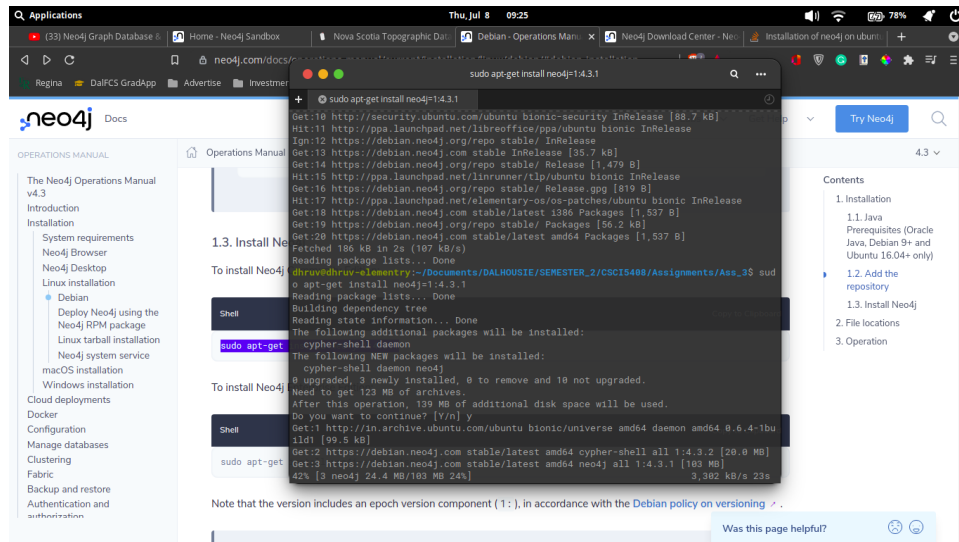
}

}

}

}
```

DATA VISUALIZATION USING GRAPH DATABASE



I WORKED ON THIS ISSUE AND COMPLETED EVERYTHING BUT IT GOT CURRUPTED

I JUST HAD THE JSON FILE AS I USED TO HAVE THE NEO4J SANDBOX BACKUP

I WILL ADD THE JSON FILE DOWN HERE

```
[
  {
    "n": {
      "identity": 0,
      "labels": [
        "Region"
      ],
      "properties": {
        "region_name": "Fundy Shore and Annapolis Valley"
```

```
    }  
  }  
},  
{  
  "n": {  
"identity": 1,  
"labels": [  
  "Region"  
],  
"properties": {  
"region_name": "Northumberland Shore"  
}  
}  
},  
{  
  "n": {  
"identity": 2,  
"labels": [  
  "Region"  
],  
"properties": {  
"region_name": "Cape Breton Island"  
}  
}  
},  
{  
  "n": {  
"identity": 3,  
"labels": [  

```

```
        "Region"
    ],
    "properties": {
        "region_name": "Eastern Shore"
    }
}
},
{
    "n": {
        "identity": 4,
        "labels": [
            "Region"
        ],
        "properties": {
            "region_name": "Halifax Region"
        }
    }
},
{
    "n": {
        "identity": 5,
        "labels": [
            "Region"
        ],
        "properties": {
            "region_name": "South Shore"
        }
    }
},
```

```
{  
  "n": {  
    "identity": 6,  
    "labels": [  
      "Region"  
    ],  
    "properties": {  
      "region_name": "Yarmouth and Acadian Shores"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 7,  
    "labels": [  
      "Province"  
    ],  
    "properties": {  
      "province_name": "NovaScotia"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 8,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {
```

"park_name": "Annapolis Basin Look Off"

}

}

},

{

"n": {

"identity": 9,

"labels": [

"Parks"

],

"properties": {

"park_name": "Anthony"

}

}

},

{

"n": {

"identity": 10,

"labels": [

"Parks"

],

"properties": {

"park_name": "Bell"

}

}

},

{

"n": {

"identity": 11,

```
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Blomidon"  
}  
}  
},  
{  
  "n": {  
"identity": 12,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Blomidon Lookoff"  
}  
}  
},  
{  
  "n": {  
"identity": 13,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Caddell Rapids Lookoff"  
}  
}  
}
```

```
},
{
  "n": {
    "identity": 14,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Cape Chignecto"
    }
  }
},
{
  "n": {
    "identity": 15,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Cape Split"
    }
  }
},
{
  "n": {
    "identity": 16,
    "labels": [
      "Parks"
    ],
```



```
"properties":{  
  "park_name": "Amherst Shore"  
}
```

```
}
```

```
},
```

```
{
```

```
  "n": {
```

```
"identity": 17,
```

```
"labels": [
```

```
  "Parks"
```

```
],
```

```
"properties":{
```

```
"park_name": "Central Grove"
```

```
  }
```

```
}
```

```
},
```

```
{
```

```
  "n": {
```

```
"identity": 18,
```

```
"labels": [
```

```
  "Parks"
```

```
],
```

```
"properties":{
```

```
"park_name": "Clairmont"
```

```
  }
```

```
}
```

```
},
```

```
{
```

```
  "n": {
```

```
"identity": 19,
"labels": [
  "Parks"
],
"properties": {
  "park_name": "Coldbrook"
}
},
{
  "n": {
"identity": 20,
"labels": [
  "Parks"
],
"properties": {
  "park_name": "Cottage Cove"
}
}
},
{
  "n": {
"identity": 21,
"labels": [
  "Parks"
],
"properties": {
  "park_name": "Eatonville"
}
}
```

```
}  
,  
{  
  "n": {  
"identity": 22,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Falls Lake"  
}  
}  
},  
{  
  "n": {  
"identity": 23,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Five Islands"  
}  
}  
},  
{  
  "n": {  
"identity": 24,  
"labels": [  
  "Parks"
```

```
    ],  
    "properties": {  
      "park_name": "Lake George"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 25,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Lake Midway"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 26,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Londonderry"  
    }  
  }  
},  
{
```

```
  "n": {
    "identity": 27,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Lumsden Pond"
    }
  },
  {
    "n": {
      "identity": 28,
      "labels": [
        "Parks"
      ],
      "properties": {
        "park_name": "MacElmons Pond"
      }
    },
    {
      "n": {
        "identity": 29,
        "labels": [
          "Parks"
        ],
        "properties": {
          "park_name": "Mickey Hill"
```

```
    }  
  }  
},  
{  
  "n": {  
"identity": 30,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Savary"  
}  
}  
},  
{  
  "n": {  
"identity": 31,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Scots Bay"  
}  
}  
},  
{  
  "n": {  
"identity": 32,  
"labels": [  

```

```
      "Parks"
    ],
    "properties": {
      "park_name": "Smileys"
    }
  },
  {
    "n": {
      "identity": 33,
      "labels": [
        "Parks"
      ],
      "properties": {
        "park_name": "Valleyview"
      }
    }
  },
  {
    "n": {
      "identity": 34,
      "labels": [
        "Parks"
      ],
      "properties": {
        "park_name": "Wentworth"
      }
    }
  },
}
```

```
{  
  "n": {  
    "identity": 35,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Arisaig"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 36,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Balmoral Mills"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 37,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {
```



```
"park_name": "Bayfield Beach"
  }
}
},
{
  "n": {
"identity": 38,
"labels": [
  "Parks"
],
"properties": {
"park_name": "Beaver Mountain"
  }
}
},
{
  "n": {
"identity": 39,
"labels": [
  "Parks"
],
"properties": {
"park_name": "Blue Sea Beach"
  }
}
},
{
  "n": {
"identity": 40,
```

```
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Caribou-Munroes Island"  
}  
}
```

```
},  
{  
  "n": {  
"identity": 41,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Fox Harbour"  
}  
}  
},  
{  
  "n": {  
"identity": 42,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Green Hill"  
}  
}
```

```
},
{
  "n": {
    "identity": 43,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Gulf Shore"
    }
  }
},
{
  "n": {
    "identity": 44,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Heather Beach"
    }
  }
},
{
  "n": {
    "identity": 45,
    "labels": [
      "Parks"
    ],
```

```
"properties":{
  "park_name": "Melmerby Beach"
}
},
{
  "n": {
    "identity": 46,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Northport Beach"
    }
  },
  {
    "n": {
      "identity": 47,
      "labels": [
        "Parks"
      ],
      "properties": {
        "park_name": "Pomquet Beach"
      }
    }
  },
  {
    "n": {
```

```
"identity": 48,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Powells Point"  
}  
}
```

```
{  
  "n": {  
"identity": 49,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Rushtons Beach"  
}  
}  
},  
{  
  "n": {
```

```
"identity": 50,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Salt Springs"  
}
```

```
    }  
  },  
  {  
    "n": {  
      "identity": 51,  
      "labels": [  
        "Parks"  
      ],  
      "properties": {  
        "park_name": "Shinimicas"  
      }  
    }  
  },  
  {  
    "n": {  
      "identity": 52,  
      "labels": [  
        "Parks"  
      ],  
      "properties": {  
        "park_name": "Tatamagouche"  
      }  
    }  
  },  
  {  
    "n": {  
      "identity": 53,  
      "labels": [  
        "Parks"
```

```
    ],  
    "properties": {  
      "park_name": "Tidnish Dock"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 54,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Waterside Beach"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 55,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Barrachoish"  
    }  
  }  
},  
{
```

```
"n": {  
  "identity": 56,  
  "labels": [  
    "Parks"  
  ],  
  "properties": {  
    "park_name": "Burnt Island"  
  }  
}  
},  
{  
  "n": {  
    "identity": 57,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Battery"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 58,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Ben Eoin"
```



```
    }  
  }  
},  
{  
  "n": {  
"identity": 59,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Cabots Landing"  
}  
}  
},  
{  
  "n": {  
"identity": 60,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Cape Smokey"  
}  
}  
},  
{  
  "n": {  
"identity": 61,  
"labels": [  

```

```
    "Parks"
  ],
  "properties": {
    "park_name": "Dalem Lake"
  }
},
{
  "n": {
    "identity": 62,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Dominion Beach"
    }
  }
},
{
  "n": {
    "identity": 63,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Dundee"
    }
  }
},
```

```
{
  "n": {
    "identity": 64,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Groves Point"
    }
  }
},
{
  "n": {
    "identity": 65,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Irish Cove"
    }
  }
},
{
  "n": {
    "identity": 66,
    "labels": [
      "Parks"
    ],
    "properties": {
```

"park_name": "Lake O' Law"

}

}

},

{

"n": {

"identity": 67,

"labels": [

"Parks"

],

"properties": {

"park_name": "Lennox Passage"

}

}

},

{

"n": {

"identity": 68,

"labels": [

"Parks"

],

"properties": {

"park_name": "Mabou"

}

}

},

{

"n": {

"identity": 69,

```
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "MacCormack"  
}  
}  
},  
{  
  "n": {  
"identity": 70,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Mira River"  
}  
}  
},  
{  
  "n": {  
"identity": 71,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "North River"  
}  
}
```

```
    },  
    {  
      "n": {  
"identity": 72,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Petersfield"  
  }  
  }  
},  
    {  
      "n": {  
"identity": 73,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Point Michaud Beach"  
  }  
  }  
},  
    {  
      "n": {  
"identity": 74,  
"labels": [  
  "Parks"  
],  
      }
```

```
"properties":{
  "park_name": "Pondville Beach"
}
},
{
  "n": {
    "identity": 75,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Port Hood Station"
    }
  },
  {
    "n": {
      "identity": 76,
      "labels": [
        "Parks"
      ],
      "properties": {
        "park_name": "Ross Ferry"
      }
    }
  }
}
```

"identity": 77,

"labels": [

 "Parks"

],

"properties": {

 "park_name": "St Anns"

 }

}

},

{

 "n": {

"identity": 78,

"labels": [

 "Parks"

],

"properties": {

 "park_name": "Trout Brook"

 }

}

},

{

 "n": {

"identity": 79,

"labels": [

 "Parks"

],

"properties": {

 "park_name": "Uisge Bàn Falls"

 }


```
}  
},  
{  
  "n": {  
"identity": 80,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "West Mabou Beach"  
}  
}  
},  
{  
  "n": {  
"identity": 81,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Whycocomagh"  
}  
}  
},  
{  
  "n": {  
"identity": 82,  
"labels": [  
  "Parks"
```

```
    ],  
    "properties": {  
      "park_name": "Black Duck Cove"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 83,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Boylston"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 84,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Clam Harbour Beach"  
    }  
  }  
},  
{
```

```
    "n": {
"identity": 85,
"labels": [
    "Parks"
],
"properties": {
"park_name": "Cole Harbour Heritage Park"
}
}
},
{
    "n": {
"identity": 86,
"labels": [
    "Parks"
],
"properties": {
"park_name": "Dollar Lake"
}
}
},
{
    "n": {
"identity": 87,
"labels": [
    "Parks"
],
"properties": {
"park_name": "Elderbank"
```

```
    }  
  }  
},  
{  
  "n": {  
"identity": 88,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Lawrencetown Beach"  
}  
}  
},  
{  
  "n": {  
"identity": 89,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Lochiel Lake"  
}  
}  
},  
{  
  "n": {  
"identity": 90,  
"labels": [  

```

```
      "Parks"
    ],
    "properties": {
      "park_name": "Marie Joseph"
    }
  },
  {
    "n": {
      "identity": 91,
      "labels": [
        "Parks"
      ],
      "properties": {
        "park_name": "Martinique Beach"
      }
    }
  },
  {
    "n": {
      "identity": 92,
      "labels": [
        "Parks"
      ],
      "properties": {
        "park_name": "Moose River Gold Mines"
      }
    }
  },
}
```

```
{
  "n": {
    "identity": 93,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Musquodoboit Valley"
    }
  },
  {
    "n": {
      "identity": 94,
      "labels": [
        "Parks"
      ],
      "properties": {
        "park_name": "Port Shoreham Beach"
      }
    },
    {
      "n": {
        "identity": 95,
        "labels": [
          "Parks"
        ],
        "properties": {
```

```
"park_name": "Porter's Lake"
  }
}
},
{
  "n": {
"identity": 96,
"labels": [
  "Parks"
],
"properties": {
"park_name": "Rainbow Haven Beach"
  }
}
},
{
  "n": {
"identity": 97,
"labels": [
  "Parks"
],
"properties": {
"park_name": "Salsman"
  }
}
},
{
  "n": {
"identity": 98,
```

```
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Sherbrooke"  
}  
}  
},  
{  
  "n": {  
"identity": 99,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Spry Bay"  
}  
}  
},  
{  
  "n": {  
"identity": 100,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Taylor Head"  
}  
}
```



```
    },  
    {  
      "n": {  
"identity": 101,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Tor Bay"  
}  
}  
},  
{  
  "n": {  
"identity": 102,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Crystal Crescent Beach"  
}  
}  
},  
{  
  "n": {  
"identity": 103,  
"labels": [  
  "Parks"  
],  
}
```

```
"properties":{
  "park_name": "Jerry Lawrence"
}
},
{
  "n": {
    "identity": 104,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Laurie"
    }
  },
  {
    "n": {
      "identity": 105,
      "labels": [
        "Parks"
      ],
      "properties": {
        "park_name": "Long Lake"
      }
    }
  }
}
```

"identity": 106,

"labels": [

 "Parks"

],

"properties": {

 "park_name": "MacCormacks Beach"

 }

}

},

{

 "n": {

"identity": 107,

"labels": [

 "Parks"

],

"properties": {

 "park_name": "McNabs and Lawlor Islands"

 }

}

},

{

 "n": {

"identity": 108,

"labels": [

 "Parks"

],

"properties": {

 "park_name": "Oakfield"

 }

```
}  
,  
{  
  "n": {  
"identity": 109,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Sackville Lakes"  
}  
}  
},  
{  
  "n": {  
"identity": 110,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Bayswater Beach"  
}  
}  
},  
{  
  "n": {  
"identity": 111,  
"labels": [  
  "Parks"
```

```
    ],  
    "properties": {  
      "park_name": "Camerons Brook"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 112,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Card Lake"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 113,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Cleveland Beach"  
    }  
  }  
},  
{
```

```
"n": {  
  "identity": 114,  
  "labels": [  
    "Parks"  
  ],  
  "properties": {  
    "park_name": "Cookville"  
  }  
}  
},  
{  
  "n": {  
    "identity": 115,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "East River"  
    }  
  }  
},  
{  
  "n": {  
    "identity": 116,  
    "labels": [  
      "Parks"  
    ],  
    "properties": {  
      "park_name": "Fancy Lake"
```

```
    }  
  }  
},  
{  
  "n": {  
"identity": 117,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Graves Island"  
}  
}  
},  
{  
  "n": {  
"identity": 118,  
"labels": [  
  "Parks"  
],  
"properties": {  
"park_name": "Hubbards"  
}  
}  
},  
{  
  "n": {  
"identity": 119,  
"labels": [  

```

```
        "Parks"
    ],
    "properties": {
        "park_name": "Port L'Hebert"
    }
},
{
    "n": {
        "identity": 120,
        "labels": [
            "Parks"
        ],
        "properties": {
            "park_name": "Queensland Beach"
        }
    },
    "n": {
        "identity": 121,
        "labels": [
            "Parks"
        ],
        "properties": {
            "park_name": "Rissers Beach"
        }
    },
}
```



```
{
  "n": {
    "identity": 122,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Sable River"
    }
  },
  {
    "n": {
      "identity": 123,
      "labels": [
        "Parks"
      ],
      "properties": {
        "park_name": "Sand Hills Beach"
      }
    },
    {
      "n": {
        "identity": 124,
        "labels": [
          "Parks"
        ],
        "properties": {
```

"park_name": "Second Peninsula"

}

}

},

{

"n": {

"identity": 125,

"labels": [

"Parks"

],

"properties": {

"park_name": "Summerville Beach"

}

}

},

{

"n": {

"identity": 126,

"labels": [

"Parks"

],

"properties": {

"park_name": "Swiss Air Memorial Site (Peggys Cove)"

}

}

},

{

"n": {

"identity": 127,

```
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Swissair Memorial Site (Bayswater)"  
}  
}  
},  
{  
  "n": {
```

```
"identity": 128,
```

```
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Ten Mile Lake"  
}  
}  
},  
{  
  "n": {
```

```
"identity": 129,
```

```
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "The Islands"  
}  
}
```

```
},
{
  "n": {
    "identity": 130,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Thomas Raddall"
    }
  }
},
{
  "n": {
    "identity": 131,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "William E. deGarthe"
    }
  }
},
{
  "n": {
    "identity": 132,
    "labels": [
      "Parks"
    ],
```

```
"properties":{
  "park_name": "Ellenwood Lake"
}
},
{
  "n": {
    "identity": 133,
    "labels": [
      "Parks"
    ],
    "properties": {
      "park_name": "Glenwood"
    }
  },
  {
    "n": {
      "identity": 134,
      "labels": [
        "Parks"
      ],
      "properties": {
        "park_name": "Mavillette Beach"
      }
    }
  }
}
```

```
"identity": 135,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Port Maitland Beach"  
}  
}  
},  
{  
  "n": {  
"identity": 136,  
"labels": [  
  "Parks"  
],  
"properties": {  
  "park_name": "Smugglers Cove"  
}  
}  
}  
]
```

REFERENCES

- [1]“Neo4j Documentation,” *Neo4j Graph Database Platform*, 27-Apr-2018. [Online]. Available: <https://neo4j.com/docs/>. [Accessed: 09-Jul-2021]
- [2]“The Neo4j Cypher Manual v4.3 - Neo4j Cypher Manual,” *Neo4j Graph Database Platform*, 2020. [Online]. Available: <https://neo4j.com/docs/cypher-manual/current/>. [Accessed: 09-Jul-2021]
- [3]“Functions - Neo4j Cypher Manual,” *Neo4j Graph Database Platform*, 2021. [Online]. Available: <https://neo4j.com/docs/cypher-manual/current/functions/>. [Accessed: 09-Jul-2021]
- [4]“Linux installation - Operations Manual,” *Neo4j Graph Database Platform*, 2021. [Online]. Available: <https://neo4j.com/docs/operations-manual/current/installation/linux/>. [Accessed: 09-Jul-2021]
- [5]News API – Search News and Blog Articles on the Web, “News API – Search News and Blog Articles on the Web,” *Newsapi.org*, 2021. [Online]. Available: <https://newsapi.org/>. [Accessed: 09-Jul-2021]
- [6]Documentation - News API, “Documentation - News API,” *Newsapi.org*, 2021. [Online]. Available: <https://newsapi.org/docs>. [Accessed: 09-Jul-2021]
- [7]“Dataproc | Google Cloud,” *Google Cloud*, 2021. [Online]. Available: <https://cloud.google.com/dataproc>. [Accessed: 09-Jul-2021]
- [8]“Compute Engine: Virtual Machines (VMs) | Google Cloud,” *Google Cloud*, 2021. [Online]. Available: <https://cloud.google.com/compute>. [Accessed: 09-Jul-2021]