Repositórios de Dados e NoSQL Programa da Disciplina eEDB-016: Hands-on Cassandra

Case: Sensor Data Modeling

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Atividade feita utilizando as plataformas DataStax e AWS Cloud9:
Evidências de:

- Criar as tabelas
- Popular dados
- Realizar consultas

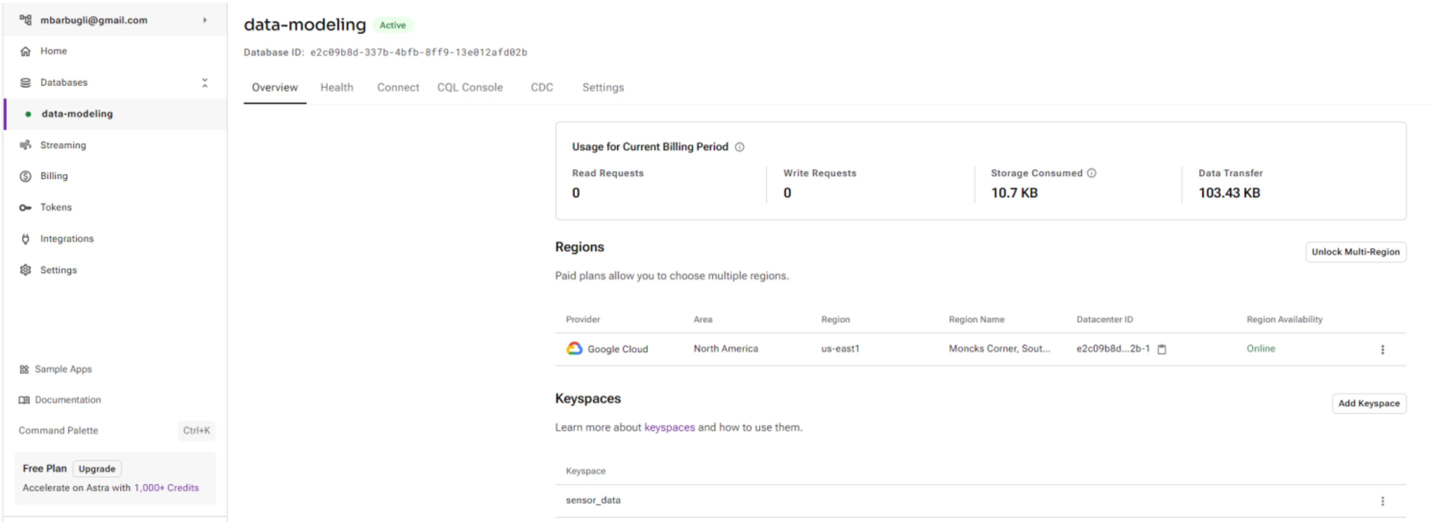
(extra) Step1: Criando um banco de dados no Astra (datastax)

```
get CLoud provider
[INFO]  Database 'data-modeling' and keyspace 'sensor_data' are being created.
[INFO]  Database 'data-modeling' has status 'PENDING' waiting to be 'ACTIVE' ...
[INFO]  Database 'data-modeling' has status 'ACTIVE' (took 111861 millis)
[OK]    Database 'data-modeling' is ready.
gitpod /workspace/data-modeling-sensor-data (main) $ astra db list
+---------------------+--------------------------------------+-----------+-------+---+-----------+
| Name                | id                                   | Regions   | Cloud | V | Status    |
+---------------------+--------------------------------------+-----------+-------+---+-----------+
| --wait              | f5efef7c-30bb-494d-95ba-f6573f558ca3 | us-east1  | gcp   |   | ACTIVE    |
| data-modeling       | e2c09b8d-337b-4bfb-8ff9-13e012afd02b | us-east1  | gcp   |   | ACTIVE    |
+---------------------+--------------------------------------+-----------+-------+---+-----------+

gitpod /workspace/data-modeling-sensor-data (main) $ astra db get data-modeling
+------------------+----------------------------------------+
| Attribute        | Value                                  |
+------------------+----------------------------------------+
| Name             | data-modeling                          |
| id               | e2c09b8d-337b-4bfb-8ff9-13e012afd02b   |
| Cloud            | GCP                                    |
| Regions          | us-east1                               |
| Status           | ACTIVE                                 |
| Vector           | Disabled                               |
| Default Keyspace | sensor_data                            |
| Creation Time    | 2024-06-06T00:38:31Z                   |
|                  |                                        |
| Keyspaces        | [0] sensor_data                        |
|                  |                                        |
|                  |                                        |
| Regions          | [0] us-east1                           |
|                  |                                        |
+------------------+----------------------------------------+

gitpod /workspace/data-modeling-sensor-data (main) $ astra db cqlsh data-modeling -k sensor_data
[INFO]  Cqlsh is starting, please wait for connection establishment...
Connected to cndb at 127.0.0.1:9042.
[cqlsh 6.8.0 | Cassandra 4.0.0.6816 | CQL spec 3.4.5 | Native protocol v4]
Use HELP for help.
token@cqlsh:sensor_data> 7W
```

Astra Dashboard – Serverless Database Service (SaaS)

Db: <u>data-modeling</u>

Keyspace: <u>sensor_data</u>



Step1: Criando banco de dados Cassandra via CQL shell, criando a KEYSPACE ‘sensor_data’ e passando a chamada para iniciar a criação das tabelas dentro deste *keyspace*:

DataStax:

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS 4   EXPOSED PORTS   AZURE   COMMENTS

./cassandragitpod /workspace/data-modeling-sensor-data (main) $ ./cassandra
Starting a Cassandra cluster ... DONE!
Cassandra successfully started.
gitpod /workspace/data-modeling-sensor-data (main) $ cqlsh
WARNING: cqlsh was built against 4.1.4, but this server is 4.0.13.  All features may not work!
Connected to Cassandra Cluster at 127.0.0.1:9042
[cqlsh 6.1.0 | Cassandra 4.0.13 | CQL spec 3.4.5 | Native protocol v5]
Use HELP for help.
cqlsh> CREATE KEYSPACE sensor_data
 'class': 'NetworkTopologyStrategy',
  'DC-Housto    ... WITH replication = {
   ...    'class': 'NetworkTopologyStrategy',
   ...    'DC-Houston': 1 };
cqlsh> USE sensor_data;
cqlsh:sensor_data>
```

AWS:

```
cqlsh> DROP KEYSPACE IF EXISTS killrvideo;


cqlsh> // CREATE KEYSPACE killrvideo WITH REPLICATION = { 'class' : 'SimpleStrategy', 'replication_factor' : 3 };
cqlsh> CREATE KEYSPACE sensor_data WITH REPLICATION = { 'class' : 'SimpleStrategy', 'replication_factor' : 1 };
cqlsh>
cqlsh>
cqlsh> USE sensor_data;
```

Step 2: Criando as tabelas networks, sensors_by_network, temperatures_by_network, e temperatures_by_sensor e executando DESCRIBE para confirmar a criação. A PRIMARY KEY é composta pela Partition Key + Clustering key. Exemplo da tabela networks é Partition Key = bucket; Clustering key = name e assim formando a PRIMARY KEY.

DataStax:

```
Use HELP for help.
cqlsh> CREATE KEYSPACE sensor_data
 'class': 'NetworkTopologyStrategy',
  'DC-Housto   ... WITH replication = {
   ...   'class': 'NetworkTopologyStrategy',
   ...   'DC-Houston': 1 };
cqlsh> USE sensor_data;
cqlsh:sensor_data> CREATE TABLE IF NOT EXISTS networks (
               ...   bucket TEXT,
               ...   name TEXT,
               ...   description TEXT,
               ...   region TEXT,
               ...   num_sensors INT,
               ...   PRIMARY KEY ((bucket),name)
               ... );
cqlsh:sensor_data> CREATE TABLE IF NOT EXISTS temperatures_by_network (
               ...   network TEXT,
               ...   week DATE,
               ...   date_hour TIMESTAMP,
               ...   sensor TEXT,
               ...   avg_temperature FLOAT,
               ...   latitude DECIMAL,
               ...   longitude DECIMAL,
               ...   PRIMARY KEY ((network,week),date_hour,sensor)
               ... ) WITH CLUSTERING ORDER BY (date_hour DESC, sensor ASC);
cqlsh:sensor_data> CREATE TABLE IF NOT EXISTS sensors_by_network (
               ...   network TEXT,
               ...   sensor TEXT,
               ...   latitude DECIMAL,
               ...   longitude DECIMAL,
               ...   characteristics MAP<TEXT,TEXT>,
               ...   PRIMARY KEY ((network),sensor)
               ... );
cqlsh:sensor_data> CREATE TABLE IF NOT EXISTS temperatures_by_sensor (
               ...   sensor TEXT,
               ...   date DATE,
               ...   timestamp TIMESTAMP,
               ...   value FLOAT,
               ...   PRIMARY KEY ((sensor,date),timestamp)
               ... ) WITH CLUSTERING ORDER BY (timestamp DESC);
cqlsh:sensor_data> DESCRIBE TABLES;

networks  sensors_by_network  temperatures_by_network  temperatures_by_sensor
```

AWS:

```
cqlsh:sensor_data> CREATE TABLE IF NOT EXISTS networks (
               ...   bucket TEXT,
               ...   name TEXT,
               ...   description TEXT,
               ...   region TEXT,
               ...   num_sensors INT,
               ...   PRIMARY KEY ((bucket),name)
               ... );
cqlsh:sensor_data> CREATE TABLE IF NOT EXISTS temperatures_by_network (
               ...   network TEXT,
               ...   week DATE,
               ...   date_hour TIMESTAMP,
               ...   sensor TEXT,
               ...   avg_temperature FLOAT,
               ...   latitude DECIMAL,
               ...   longitude DECIMAL,
               ...   PRIMARY KEY ((network,week),date_hour,sensor)
               ... ) WITH CLUSTERING ORDER BY (date_hour DESC, sensor ASC);
cqlsh:sensor_data> CREATE TABLE IF NOT EXISTS sensors_by_network (
               ...   network TEXT,
               ...   sensor TEXT,
               ...   latitude DECIMAL,
               ...   longitude DECIMAL,
               ...   characteristics MAP<TEXT,TEXT>,
               ...   PRIMARY KEY ((network),sensor)
               ... );
cqlsh:sensor_data> CREATE TABLE IF NOT EXISTS temperatures_by_sensor (
               ...   sensor TEXT,
               ...   date DATE,
               ...   timestamp TIMESTAMP,
               ...   value FLOAT,
               ...   PRIMARY KEY ((sensor,date),timestamp)
               ... ) WITH CLUSTERING ORDER BY (timestamp DESC);CREATE TABLE IF NOT EXISTS temperatures_by_sensor (
               ...   sensor TEXT,
               ...   date DATE,
               ...   timestamp TIMESTAMP,
               ...   value FLOAT,
               ...   PRIMARY KEY ((sensor,date),timestamp)
               ... ) WITH CLUSTERING ORDER BY (timestamp DESC);CREATE TABLE IF NOT EXISTS temperatures_by_sensor (
               ...   sensor TEXT,
               ...   date DATE,
               ...   timestamp TIMESTAMP,
               ...   value FLOAT,
               ...   PRIMARY KEY ((sensor,date),timestamp)
               ... ) WITH CLUSTERING ORDER BY (timestamp DESC);
cqlsh:sensor_data>
cqlsh:sensor_data>  DESCRIBE TABLES;

networks  sensors_by_network  temperatures_by_network  temperatures_by_sensor
```

STEP3: Execução de script para realizar INSERT nas 4 tabelas.

DataStax:

```
cqlsh:sensor_data> source '/workspace/data-modeling-sensor-data/assets/sensor_data.cql'
WARNING: cqlsh was built against 4.1.4, but this server is 4.0.13.  All features may not work!
```

AWS:

```
cqlsh:sensor_data> -- Populate table networks:
cqlsh:sensor_data> ---------------------------
cqlsh:sensor_data> INSERT INTO networks
               ... (bucket,name,description,region,num_sensors)
               ... VALUES ('all','forest-net',
               ...         'forest fire detection network',
               ...         'south',3);
cqlsh:sensor_data> INSERT INTO networks
               ... (bucket,name,description,region,num_sensors)
               ... VALUES ('all','volcano-net',
               ...         'volcano monitoring network',
               ...         'north',2);
INSERT INTO tcqlsh:sensor_data>
cqlsh:sensor_data>
cqlsh:sensor_data> -- Populate table sensors_by_network:
cqlsh:sensor_data> -------------------------------------
cqlsh:sensor_data> INSERT INTO sensors_by_network
itude)
VALUES ('forest-ne               ... (network,sensor,latitude,longitude,characteristics)
               ... VALUES ('forest-net','s1001',30.526503,-95.582815,
               ...        {'accuracy':'medium','sensitivity':'high'});
cqlsh:sensor_data> INSERT INTO sensors_by_network
               ... (network,sensor,latitude,longitude,characteristics)
               ... VALUES ('forest-net','s1002',30.518650,-95.583585,
               ...        {'accuracy':'medium','sensitivity':'high'});
cqlsh:sensor_data> INSERT INTO sensors_by_network
tude)
VAL                  ... (network,sensor,latitude,longitude,characteristics)
               ... VALUES ('forest-net','s1003',30.515056,-95.556225,
               ...        {'accuracy':'medium','sensitivity':'high'});

---------------------------cqlsh:sensor_data> INSERT INTO sensors_by_network
               ... (network,sensor,latitude,longitude,characteristics)
               ... VALUES ('volcano-net','s2001',44.460321,-110.828151,
               ...        {'accuracy':'high','sensitivity':'medium'});
cqlsh:sensor_data> INSERT INTO sensors_by_network
```

Realizando SELECT * na tabela networks: Partition Key = bucket; Clustering key = name; outros atributos = description, num_sensors, region.

DataStax:

```
cqlsh:sensor_data> SELECT * FROM networks;

 bucket | name        | description                   | num_sensors | region
--------+-------------+-------------------------------+-------------+--------
    all |  forest-net | forest fire detection network |           3 |  south
    all | volcano-net |    volcano monitoring network |           2 |  north
```

AWS:

```
cqlsh:sensor_data> SELECT * FROM networks;

 bucket | name        | description               | num_sensors | region
--------+-------------+---------------------------+-------------+--------
    all |  forest-net | forest fire detection network |       3 |  south
    all | volcano-net |    volcano monitoring network |       2 |  north

(2 rows)
```

Realizando SELECT, passando duas colunas que são as Partition Key (network e week), duas colunas que são as Clustering Key (date_hour e sensor), onde juntas formam a PRIMARY KEY. Outro atributo é a coluna avg_temperature.

DataStax:

```
cqlsh:sensor_data> SELECT network, week, date_hour,
               ...        sensor, avg_temperature
               ... FROM temperatures_by_network;

 network    | week       | date_hour                       | sensor | avg_temperature
------------+------------+---------------------------------+--------+-----------------
 forest-net | 2020-06-28 | 2020-07-04 12:00:00.000000+0000 |  s1001 |            97.5
 forest-net | 2020-06-28 | 2020-07-04 12:00:00.000000+0000 |  s1002 |             100
 forest-net | 2020-06-28 | 2020-07-04 12:00:00.000000+0000 |  s1003 |            98.5
 forest-net | 2020-06-28 | 2020-07-04 00:00:00.000000+0000 |  s1001 |            79.5
 forest-net | 2020-06-28 | 2020-07-04 00:00:00.000000+0000 |  s1002 |              81
 forest-net | 2020-06-28 | 2020-07-04 00:00:00.000000+0000 |  s1003 |            80.5
 forest-net | 2020-07-05 | 2020-07-06 12:00:00.000000+0000 |  s1001 |           106.5
 forest-net | 2020-07-05 | 2020-07-06 12:00:00.000000+0000 |  s1002 |             109
 forest-net | 2020-07-05 | 2020-07-06 12:00:00.000000+0000 |  s1003 |            1372
 forest-net | 2020-07-05 | 2020-07-06 00:00:00.000000+0000 |  s1001 |            90.5
 forest-net | 2020-07-05 | 2020-07-06 00:00:00.000000+0000 |  s1002 |              90
 forest-net | 2020-07-05 | 2020-07-06 00:00:00.000000+0000 |  s1003 |            90.5
 forest-net | 2020-07-05 | 2020-07-05 12:00:00.000000+0000 |  s1001 |            98.5
 forest-net | 2020-07-05 | 2020-07-05 12:00:00.000000+0000 |  s1002 |            99.5
 forest-net | 2020-07-05 | 2020-07-05 12:00:00.000000+0000 |  s1003 |           101.5
 forest-net | 2020-07-05 | 2020-07-05 00:00:00.000000+0000 |  s1001 |            80.5
 forest-net | 2020-07-05 | 2020-07-05 00:00:00.000000+0000 |  s1002 |              82
 forest-net | 2020-07-05 | 2020-07-05 00:00:00.000000+0000 |  s1003 |            82.5

(18 rows)
```

AWS:

```
cqlsh:sensor_data> SELECT network, week, date_hour,
               ...        sensor, avg_temperature
               ... FROM temperatures_by_network;

 network     | week       | date_hour                       | sensor | avg_temperature
-------------+------------+---------------------------------+--------+-----------------
 forest-net | 2020-06-28 | 2020-07-04 12:00:00.000000+0000 |  s1001 |            97.5
 forest-net | 2020-06-28 | 2020-07-04 12:00:00.000000+0000 |  s1002 |             100
 forest-net | 2020-06-28 | 2020-07-04 12:00:00.000000+0000 |  s1003 |            98.5
 forest-net | 2020-06-28 | 2020-07-04 00:00:00.000000+0000 |  s1001 |            79.5
 forest-net | 2020-06-28 | 2020-07-04 00:00:00.000000+0000 |  s1002 |              81
 forest-net | 2020-06-28 | 2020-07-04 00:00:00.000000+0000 |  s1003 |            80.5
 forest-net | 2020-07-05 | 2020-07-06 12:00:00.000000+0000 |  s1001 |           106.5
 forest-net | 2020-07-05 | 2020-07-06 12:00:00.000000+0000 |  s1002 |             109
 forest-net | 2020-07-05 | 2020-07-06 12:00:00.000000+0000 |  s1003 |            1372
 forest-net | 2020-07-05 | 2020-07-06 00:00:00.000000+0000 |  s1001 |            90.5
 forest-net | 2020-07-05 | 2020-07-06 00:00:00.000000+0000 |  s1002 |              90
 forest-net | 2020-07-05 | 2020-07-06 00:00:00.000000+0000 |  s1003 |            90.5
 forest-net | 2020-07-05 | 2020-07-05 12:00:00.000000+0000 |  s1001 |            98.5
 forest-net | 2020-07-05 | 2020-07-05 12:00:00.000000+0000 |  s1002 |            99.5
 forest-net | 2020-07-05 | 2020-07-05 12:00:00.000000+0000 |  s1003 |           101.5
 forest-net | 2020-07-05 | 2020-07-05 00:00:00.000000+0000 |  s1001 |            80.5
 forest-net | 2020-07-05 | 2020-07-05 00:00:00.000000+0000 |  s1002 |              82
 forest-net | 2020-07-05 | 2020-07-05 00:00:00.000000+0000 |  s1003 |            82.5

(18 rows)
```

Realizando SELECT * da tabela sensors_by_network. Partition Key = network; Clustering key = sensor; outros atributos = characteristics, latitude, longitude.

DataStax:

```
cqlsh:sensor_data> SELECT * FROM sensors_by_network;

 network     | sensor | characteristics                              | latitude  | longitude
-------------+--------+----------------------------------------------+-----------+-------------
  forest-net |  s1001 | {'accuracy': 'medium', 'sensitivity': 'high'} | 30.526503 |  -95.582815
  forest-net |  s1002 | {'accuracy': 'medium', 'sensitivity': 'high'} | 30.518650 |  -95.583585
  forest-net |  s1003 | {'accuracy': 'medium', 'sensitivity': 'high'} | 30.515056 |  -95.556225
 volcano-net |  s2001 | {'accuracy': 'high', 'sensitivity': 'medium'} | 44.460321 | -110.828151
 volcano-net |  s2002 | {'accuracy': 'high', 'sensitivity': 'medium'} | 44.463195 | -110.830124

(5 rows)
```

AWS:

```
cqlsh:sensor_data> SELECT * FROM sensors_by_network;

 network     | sensor | characteristics                              | latitude  | longitude
-------------+--------+----------------------------------------------+-----------+-------------
  forest-net |  s1001 | {'accuracy': 'medium', 'sensitivity': 'high'} | 30.526503 |  -95.582815
  forest-net |  s1002 | {'accuracy': 'medium', 'sensitivity': 'high'} | 30.518650 |  -95.583585
  forest-net |  s1003 | {'accuracy': 'medium', 'sensitivity': 'high'} | 30.515056 |  -95.556225
 volcano-net |  s2001 | {'accuracy': 'high', 'sensitivity': 'medium'} | 44.460321 | -110.828151
 volcano-net |  s2002 | {'accuracy': 'high', 'sensitivity': 'medium'} | 44.463195 | -110.830124

(5 rows)
```

Realizando SELECT * da tabela temperature_by_sensor. Partition Key = sensor e date; Clustering key = timestamp; outros atributos = value.

DataStax:

```
cqlsh:sensor_data> SELECT * FROM temperatures_by_sensor;

 sensor | date       | timestamp                       | value
--------+------------+---------------------------------+-------
  s1001 | 2020-07-04 | 2020-07-04 12:59:59.000000+0000 |    98
  s1001 | 2020-07-04 | 2020-07-04 12:00:01.000000+0000 |    97
  s1001 | 2020-07-04 | 2020-07-04 00:59:59.000000+0000 |    79
  s1001 | 2020-07-04 | 2020-07-04 00:00:01.000000+0000 |    80
  s1001 | 2020-07-05 | 2020-07-05 12:59:59.000000+0000 |    99
  s1001 | 2020-07-05 | 2020-07-05 12:00:01.000000+0000 |    98
  s1001 | 2020-07-05 | 2020-07-05 00:59:59.000000+0000 |    80
  s1001 | 2020-07-05 | 2020-07-05 00:00:01.000000+0000 |    81
  s1002 | 2020-07-06 | 2020-07-06 12:59:59.000000+0000 |   110
  s1002 | 2020-07-06 | 2020-07-06 12:00:01.000000+0000 |   108
  s1002 | 2020-07-06 | 2020-07-06 00:59:59.000000+0000 |    90
  s1002 | 2020-07-06 | 2020-07-06 00:00:01.000000+0000 |    90
  s1003 | 2020-07-04 | 2020-07-04 12:59:59.000000+0000 |    98
  s1003 | 2020-07-04 | 2020-07-04 12:00:01.000000+0000 |    99
  s1003 | 2020-07-04 | 2020-07-04 00:59:59.000000+0000 |    80
  s1003 | 2020-07-04 | 2020-07-04 00:00:01.000000+0000 |    81
  s1003 | 2020-07-06 | 2020-07-06 12:59:59.000000+0000 |  1429
  s1003 | 2020-07-06 | 2020-07-06 12:00:01.000000+0000 |  1315
  s1003 | 2020-07-06 | 2020-07-06 00:59:59.000000+0000 |    90
  s1003 | 2020-07-06 | 2020-07-06 00:00:01.000000+0000 |    90
  s1003 | 2020-07-05 | 2020-07-05 12:59:59.000000+0000 |   102
  s1003 | 2020-07-05 | 2020-07-05 12:00:01.000000+0000 |   101
  s1003 | 2020-07-05 | 2020-07-05 00:59:59.000000+0000 |    82
```

AWS:

```
cqlsh:sensor_data> SELECT * FROM temperatures_by_sensor;

 sensor | date       | timestamp                       | value
--------+------------+---------------------------------+-------
  s1001 | 2020-07-04 | 2020-07-04 12:59:59.000000+0000 |    98
  s1001 | 2020-07-04 | 2020-07-04 12:00:01.000000+0000 |    97
  s1001 | 2020-07-04 | 2020-07-04 00:59:59.000000+0000 |    79
  s1001 | 2020-07-04 | 2020-07-04 00:00:01.000000+0000 |    80
  s1001 | 2020-07-05 | 2020-07-05 12:59:59.000000+0000 |    99
  s1001 | 2020-07-05 | 2020-07-05 12:00:01.000000+0000 |    98
  s1001 | 2020-07-05 | 2020-07-05 00:59:59.000000+0000 |    80
  s1001 | 2020-07-05 | 2020-07-05 00:00:01.000000+0000 |    81
  s1002 | 2020-07-06 | 2020-07-06 12:59:59.000000+0000 |   110
  s1002 | 2020-07-06 | 2020-07-06 12:00:01.000000+0000 |   108
  s1002 | 2020-07-06 | 2020-07-06 00:59:59.000000+0000 |    90
  s1002 | 2020-07-06 | 2020-07-06 00:00:01.000000+0000 |    90
  s1003 | 2020-07-04 | 2020-07-04 12:59:59.000000+0000 |    98
  s1003 | 2020-07-04 | 2020-07-04 12:00:01.000000+0000 |    99
  s1003 | 2020-07-04 | 2020-07-04 00:59:59.000000+0000 |    80
  s1003 | 2020-07-04 | 2020-07-04 00:00:01.000000+0000 |    81
  s1003 | 2020-07-06 | 2020-07-06 12:59:59.000000+0000 |  1429
  s1003 | 2020-07-06 | 2020-07-06 12:00:01.000000+0000 |  1315
  s1003 | 2020-07-06 | 2020-07-06 00:59:59.000000+0000 |    90
  s1003 | 2020-07-06 | 2020-07-06 00:00:01.000000+0000 |    90
  s1003 | 2020-07-05 | 2020-07-05 12:59:59.000000+0000 |   102
  s1003 | 2020-07-05 | 2020-07-05 12:00:01.000000+0000 |   101
  s1003 | 2020-07-05 | 2020-07-05 00:59:59.000000+0000 |    82
  s1003 | 2020-07-05 | 2020-07-05 00:00:01.000000+0000 |    83
  s1002 | 2020-07-05 | 2020-07-05 12:59:59.000000+0000 |    99
  s1002 | 2020-07-05 | 2020-07-05 12:00:01.000000+0000 |   100
  s1002 | 2020-07-05 | 2020-07-05 00:59:59.000000+0000 |    82
  s1002 | 2020-07-05 | 2020-07-05 00:00:01.000000+0000 |    82
  s1002 | 2020-07-04 | 2020-07-04 12:59:59.000000+0000 |   100
  s1002 | 2020-07-04 | 2020-07-04 12:00:01.000000+0000 |   100
  s1002 | 2020-07-04 | 2020-07-04 00:59:59.000000+0000 |    80
  s1002 | 2020-07-04 | 2020-07-04 00:00:01.000000+0000 |    82
  s1001 | 2020-07-06 | 2020-07-06 12:59:59.000000+0000 |   107
  s1001 | 2020-07-06 | 2020-07-06 12:00:01.000000+0000 |   106
  s1001 | 2020-07-06 | 2020-07-06 00:59:59.000000+0000 |    90
  s1001 | 2020-07-06 | 2020-07-06 00:00:01.000000+0000 |    90

(36 rows)
```

STEP4: Buscando todas as informações da tabela networks, ordenando pela Clustering key = name.
Realizando SELECT nas colunas name, description, region, num_sensors da tabela networks:
A importância do WHERE é porque bucket representa a Partition Key da tabela networks, sendo necessário passar na query a condição de igualdade (ou desigualdade) com valor atribuído, ordenando e garantindo unicidade quando a tabela foi criada.

DataStax:

```
cqlsh:sensor_data> SELECT name, description,
               ...        region, num_sensors
               ... FROM networks
               ... WHERE bucket = 'all';

 name        | description                    | region | num_sensors
-------------+--------------------------------+--------+-------------
  forest-net | forest fire detection network  |  south |           3
 volcano-net |    volcano monitoring network  |  north |           2
```

AWS:

```
cqlsh:sensor_data> SELECT name, description,
               ...        region, num_sensors
               ... FROM networks
               ... WHERE bucket = 'all';

 name        | description                    | region | num_sensors
-------------+--------------------------------+--------+-------------
  forest-net | forest fire detection network  |  south |           3
 volcano-net |    volcano monitoring network  |  north |           2

(2 rows)
```

STEP5: Encontre as temperaturas médias horárias para cada sensor na network = **forest-net** e intervalo de datas [2020-07-05, 2020-07-06] dentro da semana de 2020-07-05; order by date (desc) e hour (desc).

DataStax:

```
cqlsh:sensor_data> SELECT date_hour, avg_temperature,
               ...        latitude, longitude, sensor
               ... FROM temperatures_by_network
               ... WHERE network    = 'forest-net'
               ...   AND week       = '2020-07-05'
               ...   AND date_hour >= '2020-07-05'
               ...   AND date_hour  < '2020-07-07';

 date_hour                       | avg_temperature | latitude  | longitude  | sensor
---------------------------------+-----------------+-----------+------------+--------
 2020-07-06 12:00:00.000000+0000 |           106.5 | 30.526503 | -95.582815 |  s1001
 2020-07-06 12:00:00.000000+0000 |             109 | 30.518650 | -95.583585 |  s1002
 2020-07-06 12:00:00.000000+0000 |            1372 | 30.515056 | -95.556225 |  s1003
 2020-07-06 00:00:00.000000+0000 |            90.5 | 30.526503 | -95.582815 |  s1001
 2020-07-06 00:00:00.000000+0000 |              90 | 30.518650 | -95.583585 |  s1002
 2020-07-06 00:00:00.000000+0000 |            90.5 | 30.515056 | -95.556225 |  s1003
 2020-07-05 12:00:00.000000+0000 |            98.5 | 30.526503 | -95.582815 |  s1001
 2020-07-05 12:00:00.000000+0000 |            99.5 | 30.518650 | -95.583585 |  s1002
 2020-07-05 12:00:00.000000+0000 |           101.5 | 30.515056 | -95.556225 |  s1003
 2020-07-05 00:00:00.000000+0000 |            80.5 | 30.526503 | -95.582815 |  s1001
 2020-07-05 00:00:00.000000+0000 |              82 | 30.518650 | -95.583585 |  s1002
 2020-07-05 00:00:00.000000+0000 |            82.5 | 30.515056 | -95.556225 |  s1003

(12 rows)
```

AWS:

```
cqlsh:sensor_data> SELECT date_hour, avg_temperature,
               ...        latitude, longitude, sensor
               ... FROM temperatures_by_network
               ... WHERE network    = 'forest-net'
               ...   AND week       = '2020-07-05'
               ...   AND date_hour >= '2020-07-05'
               ...   AND date_hour  < '2020-07-07';

 date_hour                       | avg_temperature | latitude  | longitude  | sensor
---------------------------------+-----------------+-----------+------------+--------
 2020-07-06 12:00:00.000000+0000 |           106.5 | 30.526503 | -95.582815 |  s1001
 2020-07-06 12:00:00.000000+0000 |             109 | 30.518650 | -95.583585 |  s1002
 2020-07-06 12:00:00.000000+0000 |            1372 | 30.515056 | -95.556225 |  s1003
 2020-07-06 00:00:00.000000+0000 |            90.5 | 30.526503 | -95.582815 |  s1001
 2020-07-06 00:00:00.000000+0000 |              90 | 30.518650 | -95.583585 |  s1002
 2020-07-06 00:00:00.000000+0000 |            90.5 | 30.515056 | -95.556225 |  s1003
 2020-07-05 12:00:00.000000+0000 |            98.5 | 30.526503 | -95.582815 |  s1001
 2020-07-05 12:00:00.000000+0000 |            99.5 | 30.518650 | -95.583585 |  s1002
 2020-07-05 12:00:00.000000+0000 |           101.5 | 30.515056 | -95.556225 |  s1003
 2020-07-05 00:00:00.000000+0000 |            80.5 | 30.526503 | -95.582815 |  s1001
 2020-07-05 00:00:00.000000+0000 |              82 | 30.518650 | -95.583585 |  s1002
 2020-07-05 00:00:00.000000+0000 |            82.5 | 30.515056 | -95.556225 |  s1003

(12 rows)
```

Encontre as temperaturas médias horárias para cada sensor na network = **forest-net** e intervalo de datas [2020-07-04,2020-07-06] entre as semanas de 2020-06-28 e 2020-07-05; order by date (desc) e hour (desc).

Solution1:

DataStax:

```
cqlsh:sensor_data> SELECT date_hour, avg_temperature,
               ...        latitude, longitude, sensor
               ... FROM temperatures_by_network
               ... WHERE network    = 'forest-net'
               ...   AND week       = '2020-06-28'
               ...   AND date_hour >= '2020-07-04'
               ...   AND date_hour  < '2020-07-07';

 date_hour                       | avg_temperature | latitude  | longitude  | sensor
---------------------------------+-----------------+-----------+------------+--------
 2020-07-04 12:00:00.000000+0000 |            97.5 | 30.526503 | -95.582815 |  s1001
 2020-07-04 12:00:00.000000+0000 |             100 | 30.518650 | -95.583585 |  s1002
 2020-07-04 12:00:00.000000+0000 |            98.5 | 30.515056 | -95.556225 |  s1003
 2020-07-04 00:00:00.000000+0000 |            79.5 | 30.526503 | -95.582815 |  s1001
 2020-07-04 00:00:00.000000+0000 |              81 | 30.518650 | -95.583585 |  s1002
 2020-07-04 00:00:00.000000+0000 |            80.5 | 30.515056 | -95.556225 |  s1003

(6 rows)
```

AWS:

```
cqlsh:sensor_data>
cqlsh:sensor_data> SELECT date_hour, avg_temperature,
               ...        latitude, longitude, sensor
               ... FROM temperatures_by_network
               ... WHERE network     = 'forest-net'
               ...   AND week        = '2020-06-28'
               ...   AND date_hour >= '2020-07-04'
               ...   AND date_hour  < '2020-07-07';

 date_hour                       | avg_temperature | latitude  | longitude  | sensor
---------------------------------+-----------------+-----------+------------+--------
 2020-07-04 12:00:00.000000+0000 |            97.5 | 30.526503 | -95.582815 |  s1001
 2020-07-04 12:00:00.000000+0000 |             100 | 30.518650 | -95.583585 |  s1002
 2020-07-04 12:00:00.000000+0000 |            98.5 | 30.515056 | -95.556225 |  s1003
 2020-07-04 00:00:00.000000+0000 |            79.5 | 30.526503 | -95.582815 |  s1001
 2020-07-04 00:00:00.000000+0000 |              81 | 30.518650 | -95.583585 |  s1002
 2020-07-04 00:00:00.000000+0000 |            80.5 | 30.515056 | -95.556225 |  s1003

(6 rows)
```

Solution2:

DataStax:

```
cqlsh:sensor_data> SELECT date_hour, avg_temperature,
               ...        latitude, longitude, sensor
               ... FROM temperatures_by_network
               ... WHERE network     = 'forest-net'
               ...   AND week       IN ('2020-07-05','2020-06-28')
               ...   AND date_hour >= '2020-07-04'
               ...   AND date_hour  < '2020-07-07';

 date_hour                       | avg_temperature | latitude  | longitude  | sensor
---------------------------------+-----------------+-----------+------------+--------
 2020-07-04 12:00:00.000000+0000 |            97.5 | 30.526503 | -95.582815 |  s1001
 2020-07-04 12:00:00.000000+0000 |             100 | 30.518650 | -95.583585 |  s1002
 2020-07-04 12:00:00.000000+0000 |            98.5 | 30.515056 | -95.556225 |  s1003
 2020-07-04 00:00:00.000000+0000 |            79.5 | 30.526503 | -95.582815 |  s1001
 2020-07-04 00:00:00.000000+0000 |              81 | 30.518650 | -95.583585 |  s1002
 2020-07-04 00:00:00.000000+0000 |            80.5 | 30.515056 | -95.556225 |  s1003
 2020-07-06 12:00:00.000000+0000 |           106.5 | 30.526503 | -95.582815 |  s1001
 2020-07-06 12:00:00.000000+0000 |             109 | 30.518650 | -95.583585 |  s1002
 2020-07-06 12:00:00.000000+0000 |            1372 | 30.515056 | -95.556225 |  s1003
 2020-07-06 00:00:00.000000+0000 |            90.5 | 30.526503 | -95.582815 |  s1001
 2020-07-06 00:00:00.000000+0000 |              90 | 30.518650 | -95.583585 |  s1002
 2020-07-06 00:00:00.000000+0000 |            90.5 | 30.515056 | -95.556225 |  s1003
 2020-07-05 12:00:00.000000+0000 |            98.5 | 30.526503 | -95.582815 |  s1001
 2020-07-05 12:00:00.000000+0000 |            99.5 | 30.518650 | -95.583585 |  s1002
 2020-07-05 12:00:00.000000+0000 |           101.5 | 30.515056 | -95.556225 |  s1003
 2020-07-05 00:00:00.000000+0000 |            80.5 | 30.526503 | -95.582815 |  s1001
 2020-07-05 00:00:00.000000+0000 |              82 | 30.518650 | -95.583585 |  s1002
 2020-07-05 00:00:00.000000+0000 |            82.5 | 30.515056 | -95.556225 |  s1003

(18 rows)
```

AWS:

```
cqlsh:sensor_data> SELECT date_hour, avg_temperature,
               ...        latitude, longitude, sensor
               ... FROM temperatures_by_network
               ... WHERE network    = 'forest-net'
               ...   AND week       IN ('2020-07-05','2020-06-28')
               ...   AND date_hour >= '2020-07-04'
               ...   AND date_hour  < '2020-07-07';

 date_hour                       | avg_temperature | latitude  | longitude  | sensor
---------------------------------+-----------------+-----------+------------+--------
 2020-07-04 12:00:00.000000+0000 |            97.5 | 30.526503 | -95.582815 |  s1001
 2020-07-04 12:00:00.000000+0000 |             100 | 30.518650 | -95.583585 |  s1002
 2020-07-04 12:00:00.000000+0000 |            98.5 | 30.515056 | -95.556225 |  s1003
 2020-07-04 00:00:00.000000+0000 |            79.5 | 30.526503 | -95.582815 |  s1001
 2020-07-04 00:00:00.000000+0000 |              81 | 30.518650 | -95.583585 |  s1002
 2020-07-04 00:00:00.000000+0000 |            80.5 | 30.515056 | -95.556225 |  s1003
 2020-07-06 12:00:00.000000+0000 |           106.5 | 30.526503 | -95.582815 |  s1001
 2020-07-06 12:00:00.000000+0000 |             109 | 30.518650 | -95.583585 |  s1002
 2020-07-06 12:00:00.000000+0000 |            1372 | 30.515056 | -95.556225 |  s1003
 2020-07-06 00:00:00.000000+0000 |            90.5 | 30.526503 | -95.582815 |  s1001
 2020-07-06 00:00:00.000000+0000 |              90 | 30.518650 | -95.583585 |  s1002
 2020-07-06 00:00:00.000000+0000 |            90.5 | 30.515056 | -95.556225 |  s1003
 2020-07-05 12:00:00.000000+0000 |            98.5 | 30.526503 | -95.582815 |  s1001
 2020-07-05 12:00:00.000000+0000 |            99.5 | 30.518650 | -95.583585 |  s1002
 2020-07-05 12:00:00.000000+0000 |           101.5 | 30.515056 | -95.556225 |  s1003
 2020-07-05 00:00:00.000000+0000 |            80.5 | 30.526503 | -95.582815 |  s1001
 2020-07-05 00:00:00.000000+0000 |              82 | 30.518650 | -95.583585 |  s1002
 2020-07-05 00:00:00.000000+0000 |            82.5 | 30.515056 | -95.556225 |  s1003

(18 rows)
```

STEP6: Buscando informações de todos os sensors (Clustering Key) em network (Partition Key) onde o valor seja = **'forest-net'**.

DataStax:

```
cqlsh:sensor_data> SELECT *
               ... FROM sensors_by_network
               ... WHERE network = 'forest-net';

 network    | sensor | characteristics                                   | latitude  | longitude
------------+--------+---------------------------------------------------+-----------+------------
 forest-net |  s1001 | {'accuracy': 'medium', 'sensitivity': 'high'} | 30.526503 | -95.582815
 forest-net |  s1002 | {'accuracy': 'medium', 'sensitivity': 'high'} | 30.518650 | -95.583585
 forest-net |  s1003 | {'accuracy': 'medium', 'sensitivity': 'high'} | 30.515056 | -95.556225

(3 rows)
```

AWS:

```
cqlsh:sensor_data> SELECT *
               ... FROM sensors_by_network
               ... WHERE network = 'forest-net';

 network    | sensor | characteristics                               | latitude  | longitude
------------+--------+-----------------------------------------------+-----------+------------
 forest-net |  s1001 | {'accuracy': 'medium', 'sensitivity': 'high'} | 30.526503 | -95.582815
 forest-net |  s1002 | {'accuracy': 'medium', 'sensitivity': 'high'} | 30.518650 | -95.583585
 forest-net |  s1003 | {'accuracy': 'medium', 'sensitivity': 'high'} | 30.515056 | -95.556225

(3 rows)
```

STEP7: Encontre medições brutas para o <u>sensor</u> **s1003** em 2020-07-06; order by **timestamp** (desc).

DataStax:

```
cqlsh:sensor_data> SELECT timestamp, value
               ... FROM temperatures_by_sensor
               ... WHERE sensor = 's1003'
               ...   AND date   = '2020-07-06';

 timestamp                       | value
---------------------------------+-------
 2020-07-06 12:59:59.000000+0000 |  1429
 2020-07-06 12:00:01.000000+0000 |  1315
 2020-07-06 00:59:59.000000+0000 |    90
 2020-07-06 00:00:01.000000+0000 |    90

(4 rows)
```

AWS:

```
cqlsh:sensor_data> SELECT timestamp, value
               ... FROM temperatures_by_sensor
               ... WHERE sensor = 's1003'
               ...   AND date   = '2020-07-06';

 timestamp                       | value
---------------------------------+-------
 2020-07-06 12:59:59.000000+0000 |  1429
 2020-07-06 12:00:01.000000+0000 |  1315
 2020-07-06 00:59:59.000000+0000 |    90
 2020-07-06 00:00:01.000000+0000 |    90

(4 rows)
```

Consideração final entre DataStax e AWS Cloud9:

1. A diferença que encontramos foi ao criar imagem do Cassandra no Cloud9, onde é necessário. Já no dataStax precisamos apenas iniciar pois a imagem já está montada.
2. Para criar o KEYSPACE, a sintaxe entre DataStax e AWS Cloud9 sofre alteração, pois no DataStax permite a criação da classe da réplica = 'NetworkTopologyStrategy', enquanto nossa conta na AWS Academy só permite o

‘SimpleStrategy’. Outro fator é que pelo DataStax (GCP) passamos a região que nossa replicação estará alocada e pelo AWS Cloud9 podemos escolher o ‘replication_factor’ = 1 (ou 2, 3) região(ões). E.g.:

a. DataStax: CREATE KEYSPACE sensor_data WITH REPLICATION = { 'class': 'NetworkTopologyStrategy', 'DC-Houston': 1 };
b. AWS Cloud9: CREATE KEYSPACE sensor_data WITH REPLICATION = { 'class' : 'SimpleStrategy', 'replication_factor' : 1 };

Repositórios de Dados e NoSQL Programa da Disciplina eEDB-016: Hands-on Cassandra

Case: Killrvideo

Grupo 1:
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1) Puxando a última versão da imagem do container do cassandra e criando um container com essa imagem

```
voclabs:~/environment $ sudo docker pull cassandra:latest
latest: Pulling from library/cassandra
2ec76a50fe7c: Pull complete
fab7f202453a: Pull complete
1345745e80b1: Pull complete
630caf231810: Pull complete
a8ac19e63e2c: Pull complete
e145e559abea: Pull complete
209f85faec31: Pull complete
8b9c18eeae1b: Pull complete
2846f5334cf5: Pull complete
d7609c601509: Pull complete
Digest: sha256:52510388c3c29080a9cb6056e49939905a8e36eb9ae191fda32e574b5c591b70
Status: Downloaded newer image for cassandra:latest
docker.io/library/cassandra:latest
voclabs:~/environment $ sudo docker run --restart=always --name cassndra -d cassandra:latest
6ca27a562f0148a0f3fd4363f102c7b89af459f91fc81ee4ee6ff56e53e371e0
voclabs:~/environment $
```

2) Executando comando cqlsh dentro do docker com terminal interativo do cassandra

```
voclabs:~/environment $ sudo docker exec -it cassndra cqlsh
Connected to Test Cluster at 127.0.0.1:9042
[cqlsh 6.1.0 | Cassandra 4.1.5 | CQL spec 3.4.6 | Native protocol v5]
Use HELP for help.
cqlsh>
```

3) Criando keyspace utilizando o arquivo killrvideo-schema.cql, que contém os comandos de criação do keyspace e posteriormente criando as tabelas descritas na modelagem do killrvideo. Após esse processo, utilizando o comando "describe keyspaces" para listar todos os keyspaces criados

```
cqlsh:killrvideo> describe keyspaces;

killrvideo  system_auth         system_schema  system_views
system      system_distributed  system_traces  system_virtual_schema

cqlsh:killrvideo>
```

4) Utilizando o script killrvideo-inserts.cql, que contém todos os comandos necessários para popular as tabelas do keyspace killrvideo

```
cqlsh:killrvideo>
cqlsh:killrvideo> INSERT INTO videos_by_tag (tag, videoid, tagged_date, added_date, name, preview_image_location)
              ... VALUES ('cassandra',49f64d40-7d89-4890-b910-dbf923563a33, '2013-06-11 11:00:00','2013-06-11 11:00:00','The World''s Next Top Data Model','http://www.youtube.com/watch?v=HdJlsOZVGwM');
cqlsh:killrvideo>
cqlsh:killrvideo> INSERT INTO videos_by_tag (tag, videoid, tagged_date, added_date, name, preview_image_location)
              ... VALUES ('data model',49f64d40-7d89-4890-b910-dbf923563a33, '2013-06-11 11:00:00','2013-06-11 11:00:00','The World''s Next Top Data Model','http://www.youtube.com/watch?v=HdJlsOZVGwM');
cqlsh:killrvideo>
cqlsh:killrvideo> INSERT INTO videos_by_tag (tag, videoid, tagged_date, added_date, name, preview_image_location)
              ... VALUES ('examples',49f64d40-7d89-4890-b910-dbf923563a33, '2013-06-11 11:00:00','2013-06-11 11:00:00','The World''s Next Top Data Model','http://www.youtube.com/watch?v=HdJlsOZVGwM');
cqlsh:killrvideo>
cqlsh:killrvideo> INSERT INTO videos_by_tag (tag, videoid, tagged_date, added_date, name, preview_image_location)
              ... VALUES ('instruction',49f64d40-7d89-4890-b910-dbf923563a33, '2013-06-11 11:00:00','2013-06-11 11:00:00','The World''s Next Top Data Model','http://www.youtube.com/watch?v=HdJlsOZVGwM');
cqlsh:killrvideo>
cqlsh:killrvideo> // Video Comments. One for each side of the view.
cqlsh:killrvideo> // Insert in pairs
cqlsh:killrvideo> // This is done using the logged batch command to group our operations to ensure both actions are eventually taken.
cqlsh:killrvideo> BEGIN BATCH
              ...    INSERT INTO comments_by_video (videoid, userid, commentid, comment)
              ...    VALUES (99051fe9-6a9c-46c2-b949-38ef78858dd0,d0f60aa8-54a9-4840-b70c-fe562b68842b,now(), 'VERY Helpful thanks!!');
              ...    INSERT INTO comments_by_video (videoid, userid, commentid, comment)
              ...    VALUES (99051fe9-6a9c-46c2-b949-38ef78858dd0,d0f60aa8-54a9-4840-b70c-fe562b68842b,now(), 'I am always follow your channel and watch later in YT.');
              ... APPLY BATCH;
cqlsh:killrvideo>
cqlsh:killrvideo> BEGIN BATCH
              ...    INSERT INTO comments_by_video (videoid, userid, commentid, comment)
              ...    VALUES (99051fe9-6a9c-46c2-b949-38ef78858dd0,522b1fe2-2e36-4cef-a667-cd4237d08b89,now(), 'let me cover it when i get a break');
              ...    INSERT INTO comments_by_video (videoid, userid, commentid, comment)
              ...    VALUES (99051fe9-6a9c-46c2-b949-38ef78858dd0,522b1fe2-2e36-4cef-a667-cd4237d08b89,now(), 'It is amazing');
              ... APPLY BATCH;
cqlsh:killrvideo>
cqlsh:killrvideo>
cqlsh:killrvideo>
cqlsh:killrvideo> // Comments by users.
cqlsh:killrvideo> BEGIN BATCH
              ...    INSERT INTO comments_by_user (userid, comment, commentid)
              ...    VALUES (d0f60aa8-54a9-4840-b70c-fe562b68842b,'VERY Helpful thanks!!', d6177351-f97e-11ed-b9cb-07c3a76482fb);
              ...    INSERT INTO comments_by_user (userid, comment, commentid)
              ...    VALUES (d0f60aa8-54a9-4840-b70c-fe562b68842b,'I am always follow your channel and watch later in YT.', d6177350-f97e-11ed-b9cb-07c3a76482fb);
              ... APPLY BATCH;
cqlsh:killrvideo>
cqlsh:killrvideo> BEGIN BATCH
              ...    INSERT INTO comments_by_user (userid, comment, commentid)
              ...    VALUES (522b1fe2-2e36-4cef-a667-cd4237d08b89,'It is amazing', d618d2e1-f97e-11ed-b9cb-07c3a76482fb);
              ...    INSERT INTO comments_by_user (userid, comment, commentid)
              ...    VALUES (522b1fe2-2e36-4cef-a667-cd4237d08b89,'let me cover it when i get a break', d618d2e0-f97e-11ed-b9cb-07c3a76482fb);
              ... APPLY BATCH;
cqlsh:killrvideo>
```

5) Selecionando todas as keys da tabela users

```
cqlsh:killrvideo> select * from users;

 userid                               | created_date                    | email              | firstname | lastname
--------------------------------------+---------------------------------+--------------------+-----------+------------
 522b1fe2-2e36-4cef-a667-cd4237d08b89 | 2011-06-20 13:50:00.000000+0000 |   estrella@usp.br  |  Patricio |   Estrella
 d0f60aa8-54a9-4840-b70c-fe562b68842b | 2011-06-01 08:00:00.000000+0000 | bobesponja@usp.br  |       Bob |    Esponja
 9761d3d7-7fbd-4269-9988-6cfd4e188678 | 2011-06-20 13:50:00.000000+0000 |  calamardo@usp.br  | Calamardo | Tentáculos

(3 rows)
cqlsh:killrvideo>
```

6) Selecionando as keys email, userid da tabela user_by_email onde o email é igual a bobesponja@usp.br

```
cqlsh:killrvideo> select email, userid from user_by_email where email = 'bobesponja@usp.br';

 email             | userid
-------------------+--------------------------------------
 bobesponja@usp.br | d0f60aa8-54a9-4840-b70c-fe562b68842b

(1 rows)
cqlsh:killrvideo>
```

7) Selecionando primeiro e segundo nome da tabela usuarios onde o userid é d0f60aa8-54a9-4840-b70c-fe562b68842b

```
cqlsh:killrvideo> select firstname, lastname from users where userid = d0f60aa8-54a9-4840-b70c-fe562b68842b;

 firstname | lastname
-----------+----------
       Bob |  Esponja

(1 rows)
```

8) Selecionando todas as keys da tabela vídeos onde o videoid é igual a 06049cbb-dfed-421f-b889-5f649a0de1ed

```
cqlsh:killrvideo> select * from videos where videoid = 06049cbb-dfed-421f-b889-5f649a0de1ed;

 videoid                              | added_date                      | description                                          | location                                     | location_type | name
    | preview_image_location                     | tags                                                        | userid
--------------------------------------+---------------------------------+------------------------------------------------------+----------------------------------------------+---------------+------------------------------------------
-----+--------------------------------------------+-------------------------------------------------------------+--------------------------------------
 06049cbb-dfed-421f-b889-5f649a0de1ed | 2013-05-02 12:30:29.000000+0000 | First in a three part series for Cassandra Data Modeling | http://www.youtube.com/watch?v=px6U2n74q3g |             1 | The data model is dead. Long live the data mo
del. | http://www.youtube.com/watch?v=px6U2n74q3g | {'cassandra', 'data model', 'instruction', 'relational'} | 9761d3d7-7fbd-4269-9988-6cfd4e188678

(1 rows)
cqlsh:killrvideo>
```

9) Selecionando somente a key tags onde o videoid é igual a 06049cbb-dfed-421f-b889-5f649a0de1ed

```
cqlsh:killrvideo> select tags from videos where videoid = 06049cbb-dfed-421f-b889-5f649a0de1ed;

 tags
----------------------------------------------------------
 {'cassandra', 'data model', 'instruction', 'relational'}

(1 rows)
cqlsh:killrvideo>
```

10) Selecionando as keys name, videoID, added_date da tabela videos_by_user onde o userid é igual 9761d3d7-7fbd-4269-9988-6cfd4e188678

```
cqlsh:killrvideo> select name, videoId, added_date from videos_by_user where userid = 9761d3d7-7fbd-4269-9988-6cfd4e188678;

 name                                          | videoid                              | added_date
-----------------------------------------------+--------------------------------------+---------------------------------
                  The World's Next Top Data Model | 49f64d40-7d89-4890-b910-dbf923563a33 | 2013-06-11 11:00:00.000000+0000
                          Become a Super Modeler | 873ff430-9c23-4e60-be5f-278ea2bb21bd | 2013-05-16 16:50:00.000000+0000
 The data model is dead. Long live the data model. | 06049cbb-dfed-421f-b889-5f649a0de1ed | 2013-05-02 12:30:29.000000+0000

(3 rows)
```

11) Selecionando as keys name, videoID, added_date da tabela videos_by_user onde o userid é igual 9761d3d7-7fbd-4269-9988-6cfd4e188678 ordenando por data de maneira crescente

```
cqlsh:killrvideo> select name, videoId, added_date from videos_by_user where userid = 9761d3d7-7fbd-4269-9988-6cfd4e188678 order by added_date;

 name                                              | videoid                              | added_date
---------------------------------------------------+--------------------------------------+---------------------------------
 The data model is dead. Long live the data model. | 06049cbb-dfed-421f-b889-5f649a0de1ed | 2013-05-02 12:30:29.000000+0000
                            Become a Super Modeler | 873ff430-9c23-4e60-be5f-278ea2bb21bd | 2013-05-16 16:50:00.000000+0000
                   The World's Next Top Data Model | 49f64d40-7d89-4890-b910-dbf923563a33 | 2013-06-11 11:00:00.000000+0000

(3 rows)
```

12) Selecionando as keys name, videoID, added_date da tabela videos_by_user onde o userid é igual 9761d3d7-7fbd-4269-9988-6cfd4e188678 ordenando por data de forma decrescente e limitando a saída a uma única entrada

```
cqlsh:killrvideo> select name, videoId, added_date from videos_by_user where userid = 9761d3d7-7fbd-4269-9988-6cfd4e188678 order by added_date desc limit 1;

 name                           | videoid                              | added_date
--------------------------------+--------------------------------------+---------------------------------
 The World's Next Top Data Model | 49f64d40-7d89-4890-b910-dbf923563a33 | 2013-06-11 11:00:00.000000+0000

(1 rows)
cqlsh:killrvideo>
```

13) Selecionando as keys name, videoID, added_date da tabela videos_by_user onde o userid é igual 9761d3d7-7fbd-4269-9988-6cfd4e188678 e a data de criação(added_date) é maior que 01/06/2013

```
cqlsh:killrvideo> select name, videoId, added_date from videos_by_user where userid = 9761d3d7-7fbd-4269-9988-6cfd4e188678 and added_date > '2013-06-01';

 name                           | videoid                              | added_date
--------------------------------+--------------------------------------+---------------------------------
 The World's Next Top Data Model | 49f64d40-7d89-4890-b910-dbf923563a33 | 2013-06-11 11:00:00.000000+0000

(1 rows)
cqlsh:killrvideo>
```

14) Selecionando as keys name, videoID, added_date da tabela videos_by_user onde o userid é igual 9761d3d7-7fbd-4269-9988-6cfd4e188678 e a data de criação está entre as datas 01/06/2013 e 15/05/2013

```
cqlsh:killrvideo> select name, videoId, added_date from videos_by_user where userid = 9761d3d7-7fbd-4269-9988-6cfd4e188678 and added_date < '2013-06-01' and added_date > '2013-05-15' order by added_date;

 name                  | videoid                              | added_date
-----------------------+--------------------------------------+---------------------------------
 Become a Super Modeler | 873ff430-9c23-4e60-be5f-278ea2bb21bd | 2013-05-16 16:50:00.000000+0000

(1 rows)
cqlsh:killrvideo>
```

15) Selecionando as keys rating_counter e rating_total da table video_rating onde o videoid é igual 99051fe9-6a9c-46c2-b949-38ef78858dd0

```
cqlsh:killrvideo> select rating_counter, rating_total from video_rating where videoId = 99051fe9-6a9c-46c2-b949-38ef78858dd0;

 rating_counter | rating_total
----------------+--------------
              3 |           12

(1 rows)
cqlsh:killrvideo>
```

16) Executando a operação rating_total/rating_counter para pegar a media de ratings do video 99051fe9-6a9c-46c2-b949-38ef78858dd0

```
cqlsh:killrvideo> select rating_total/rating_counter as "AVG rating" from video_rating where videoId = 99051fe9-6a9c-46c2-b949-38ef78858dd0;

 AVG rating
------------
          4

(1 rows)
cqlsh:killrvideo>
```

17) Selecionando as keys videoId e tagged_date da table videos_by_tag onde a key tag é igual a “lol”

```
cqlsh:killrvideo> select videoId, tagged_date from videos_by_tag where tag = 'lol';

 videoid                              | tagged_date
--------------------------------------+---------------------------------
 99051fe9-6a9c-46c2-b949-38ef78858dd0 | 2012-05-25 08:30:29.000000+0000
 b3a76c6b-7c7f-4af6-964f-803a9283c401 | 2012-08-30 16:50:00.000000+0000

(2 rows)
cqlsh:killrvideo>
```

18) Selecionando as keys userId e comment, e convertendo commentId em data na tabela comment_by_video onde o userid é igual a 99051fe9-6a9c-46c2-b949-38ef78858dd0.

```
 userid                               | comment                                               | system.dateof(commentid)
--------------------------------------+-------------------------------------------------------+---------------------------------
 522b1fe2-2e36-4cef-a667-cd4237d08b89 |                                         It is amazing | 2024-06-06 00:11:03.171000+0000
 522b1fe2-2e36-4cef-a667-cd4237d08b89 |                         let me cover it when i get a break | 2024-06-06 00:11:03.171000+0000
 d0f60aa8-54a9-4840-b70c-fe562b68842b | I am always follow your channel and watch later in YT. | 2024-06-06 00:11:03.160000+0000
 d0f60aa8-54a9-4840-b70c-fe562b68842b |                                   VERY Helpful thanks!! | 2024-06-06 00:11:03.160000+0000

(4 rows)
cqlsh:killrvideo>
```

19) Selecionando as keys userId e comment, e convertendo commentId em data na tabela comment_by_user onde o userid é igual a d0f60aa8-54a9-4840-b70c-fe562b68842b . e limitando a saída a um único registro.

```
cqlsh:killrvideo> select userid, comment, dateOf(commentid) from comments_by_user where userid = d0f60aa8-54a9-4840-b70c-fe562b68842b LIMIT 1;

 userid                               | comment               | system.dateof(commentid)
--------------------------------------+-----------------------+---------------------------------
 d0f60aa8-54a9-4840-b70c-fe562b68842b | VERY Helpful thanks!! | 2023-05-23 15:31:07.141000+0000

(1 rows)
cqlsh:killrvideo>
```

20) Selecionando as keys userId e comment, e convertendo commentId em data na tabela comment_by_user onde o userid é igual a d0f60aa8-54a9-4840-b70c-fe562b68842b .

```
cqlsh:killrvideo> select userid, comment, dateOf(commentid) from comments_by_user where userid = d0f60aa8-54a9-4840-b70c-fe562b68842b;

 userid                               | comment                                                | system.dateof(commentid)
--------------------------------------+--------------------------------------------------------+---------------------------------
 d0f60aa8-54a9-4840-b70c-fe562b68842b |                                  VERY Helpful thanks!! | 2023-05-23 15:31:07.141000+0000
 d0f60aa8-54a9-4840-b70c-fe562b68842b | I am always follow your channel and watch later in YT. | 2023-05-23 15:31:07.141000+0000

(2 rows)
cqlsh:killrvideo>
```

21) Adicionando a tag "wet cats" na key tags do registro com videoid igual a 99051fe9-6a9c-46c2-b949-38ef78858dd0.

```
cqlsh:killrvideo> select userid, comment, dateOf(commentid) from comments_by_user where userid = d0f60aa8-54a9-4840-b70c-fe562b68842b;

 userid                               | comment                                                | system.dateof(commentid)
--------------------------------------+--------------------------------------------------------+---------------------------------
 d0f60aa8-54a9-4840-b70c-fe562b68842b |                                  VERY Helpful thanks!! | 2023-05-23 15:31:07.141000+0000
 d0f60aa8-54a9-4840-b70c-fe562b68842b | I am always follow your channel and watch later in YT. | 2023-05-23 15:31:07.141000+0000

(2 rows)
cqlsh:killrvideo>
```

```
cqlsh:killrvideo> select videoid, name, tags from videos where videoid = 99051fe9-6a9c-46c2-b949-38ef78858dd0;

 videoid                              | name         | tags
--------------------------------------+--------------+--------------------------
 99051fe9-6a9c-46c2-b949-38ef78858dd0 | My funny cat | {'cats', 'lol', 'piano'}

(1 rows)
cqlsh:killrvideo>
```

```
cqlsh:killrvideo> update videos set tags = tags + {'wet cat'} where videoid = 99051fe9-6a9c-46c2-b949-38ef78858dd0;
cqlsh:killrvideo> select videoid, name, tags from videos where videoid = 99051fe9-6a9c-46c2-b949-38ef78858dd0;

 videoid                              | name         | tags
--------------------------------------+--------------+-------------------------------------
 99051fe9-6a9c-46c2-b949-38ef78858dd0 | My funny cat | {'cats', 'lol', 'piano', 'wet cat'}

(1 rows)
cqlsh:killrvideo>
```