

S17 T01: Bases de dades relacionals – Eduardo Baffi

Descripció*

Comencem a familiaritzar-nos amb bases de dades NoSQL !!! Comencem amb uns quants exercicis bàsics

Nivell 1

- Exercici 1

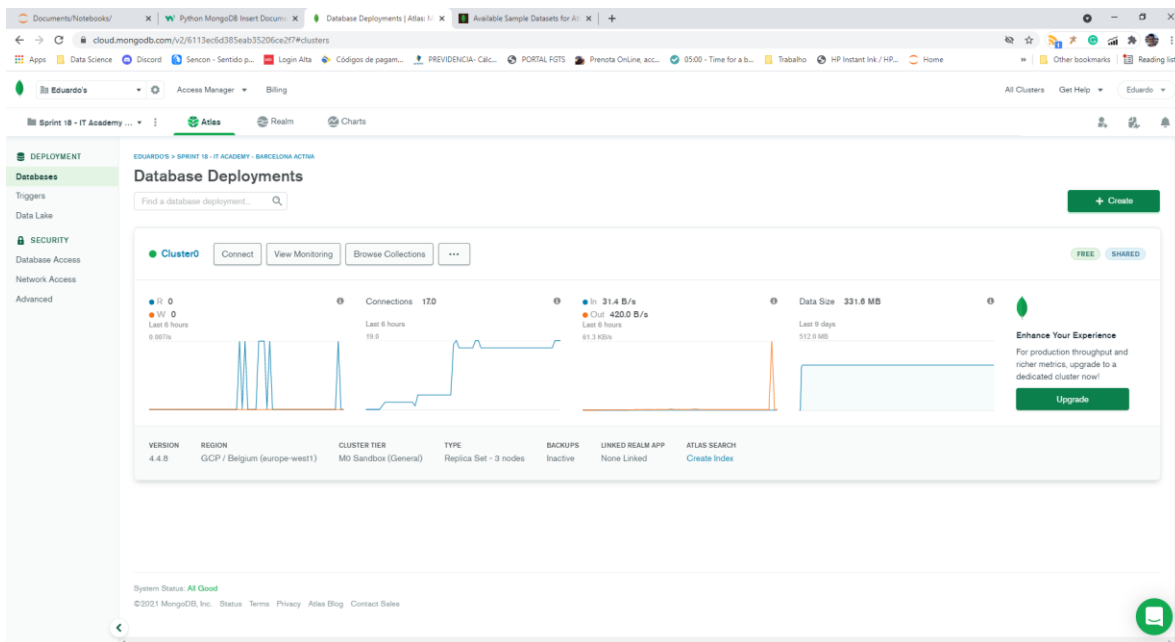
Crea una base de dades NoSQL utilitzant MongoDB. Afegeix-li algunes dades d'exemple que et permetin comprovar que ets capaç de processar-ne la informació de manera bàsica.

This exercise was done using the visual environment of *MongoDB Compass*. The following steps were followed:

1. Install MongoDB Compass.
2. Create a database called *myfirstdb*.
3. Create two collections ("car_fleet" and "city").
4. Insert brief documents on both collections.
5. Load a sample dataset directly on MongoDB Atlas (Cloud Database). The sample includes eight databases containing data about different sectors.

Some screenshots of the MongoDB Atlas and Compass interfaces are shown below:

Cluster0 Overview



Myfirstdb Database

MongoDB Compass - cluster0.sjggt.mongodb.net/myfirstdb
Connect View Help

Local

12 DBS 31 COLLECTIONS

HOSTS

- cluster0-shard-00-02.opgt...
- cluster0-shard-00-00.opgt...
- cluster0-shard-00-01.opgt...

CLUSTER

Replica Set (atlas-mc20z-...

3 Nodes

EDITION

MongoDB 4.4.0 Enterprise

Filter your data

- admin
- config
- local
- mydatabase
- myfirstdb

myfirstdb

- car_fleet
- city
- sample_artab
- sample_analytice
- sample_geospatal
- sample_mile
- sample_restaurants
- sample_supplies
- sample_training
- sample_weatherdata

CREATE COLLECTION

Collection Name	Documents	Avg. Document Size	Total Document Size	Num. Indexes	Total Index Size	Properties
car_fleet	5	90.6 B	453.0 B	1	36.0 KB	
city	5	87.6 B	439.0 B	1	36.0 KB	

- *car_fleet* collection documents

MongoDB Compass - cluster0.sjggt.mongodb.net/myfirstdb.car_fleet
Connect View Collection Help

Local

12 DBS 31 COLLECTIONS

HOSTS

- cluster0-shard-00-02.opgt...
- cluster0-shard-00-00.opgt...
- cluster0-shard-00-01.opgt...

CLUSTER

Replica Set (atlas-mc20z-...

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- admin
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myfirstdb

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- sample_supplies
- sample_training
- sample_weatherdata

myfirstdb.car_fleet

Documents

5 DOCUMENTS TOTAL SIZE 453B AVG. SIZE 91B 1 INDEXES TOTAL SIZE 36.0KB AVG. SIZE 36.0KB

Documents Aggregations Schema Explain Plan Indexes Validation

Filter (field: "value")

ADD DATA VIEW

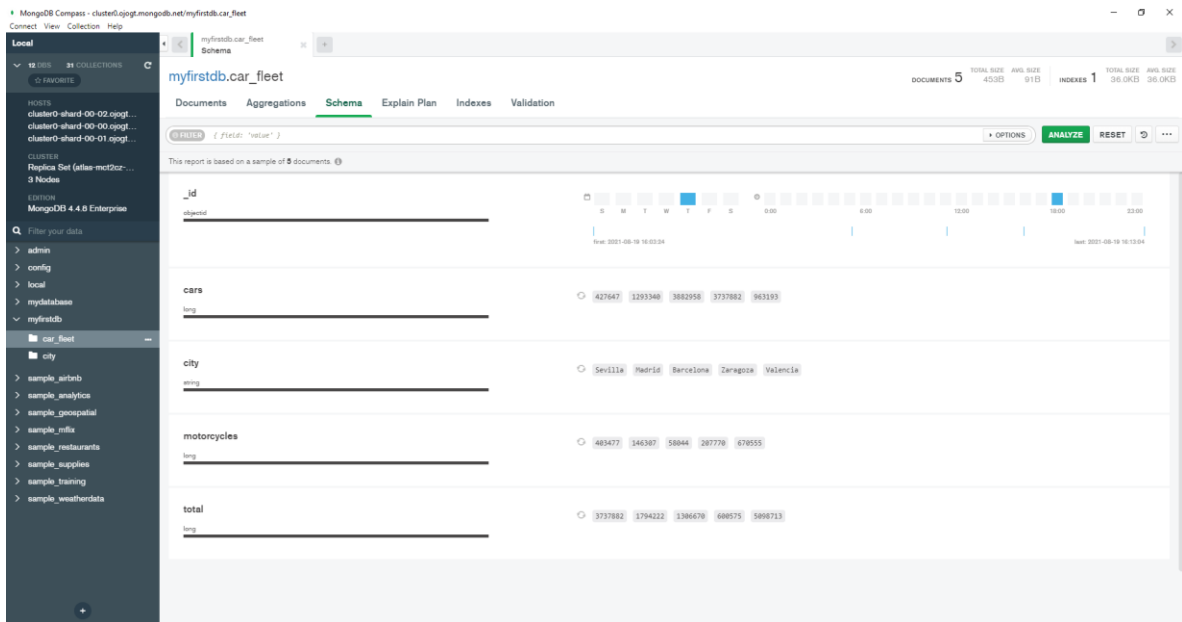
The content is outdated and no longer in sync with the current query. Press "Find" again to see the results for the current query.

Displaying documents 1 - 5 of 5

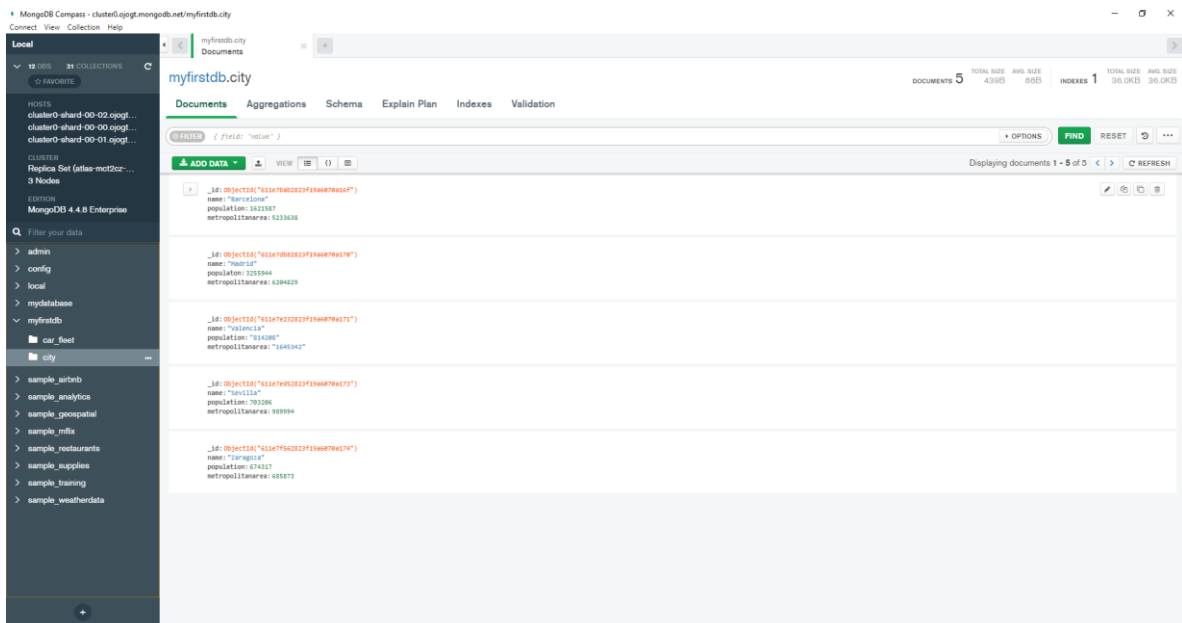
Refresh

```
{ "_id": "003c1c361f6310861c2023f3b607961797",  
  "city": "Barcelona",  
  "cars": 3737002,  
  "motorcycles": 67005,  
  "total": 3737002 }  
  
{ "_id": "003c1c361f6310861c2023f3b607961797",  
  "city": "Madrid",  
  "cars": 5003000,  
  "motorcycles": 403477,  
  "total": 5003000 }  
  
{ "_id": "003c1c361f6310861c2023f3b607961797",  
  "city": "Camaguey",  
  "cars": 427647,  
  "motorcycles": 10004,  
  "total": 40075 }  
  
{ "_id": "003c1c361f6310861c2023f3b607961797",  
  "city": "Sovilla",  
  "cars": 901003,  
  "motorcycles": 140307,  
  "total": 1000670 }  
  
{ "_id": "003c1c361f6310861c2023f3b607961797",  
  "city": "Valencia",  
  "cars": 1201040,  
  "motorcycles": 240770,  
  "total": 1774222 }
```

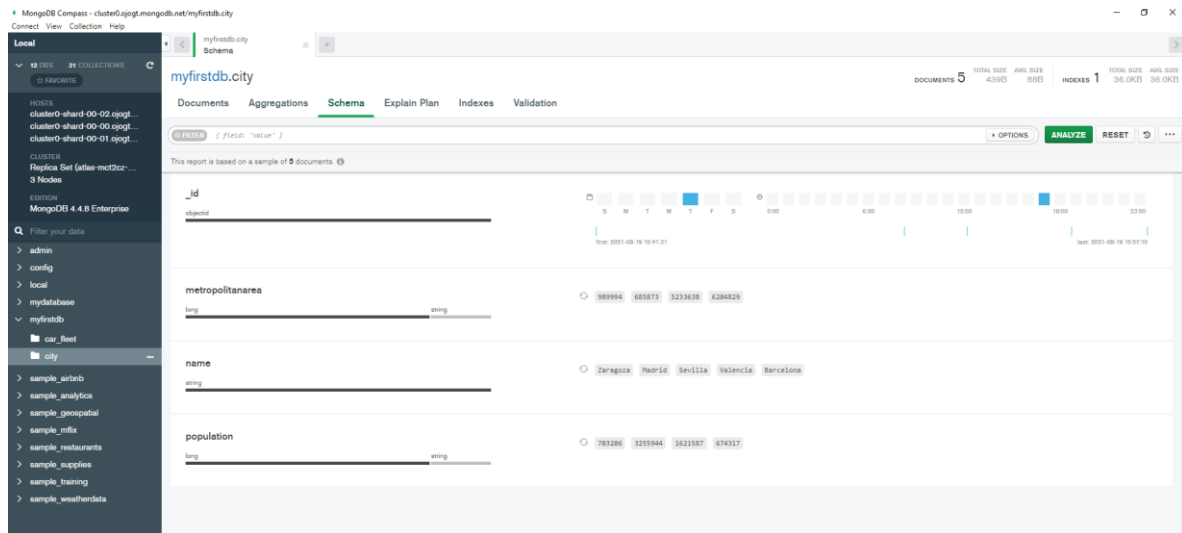
- *car_fleet* collection schema



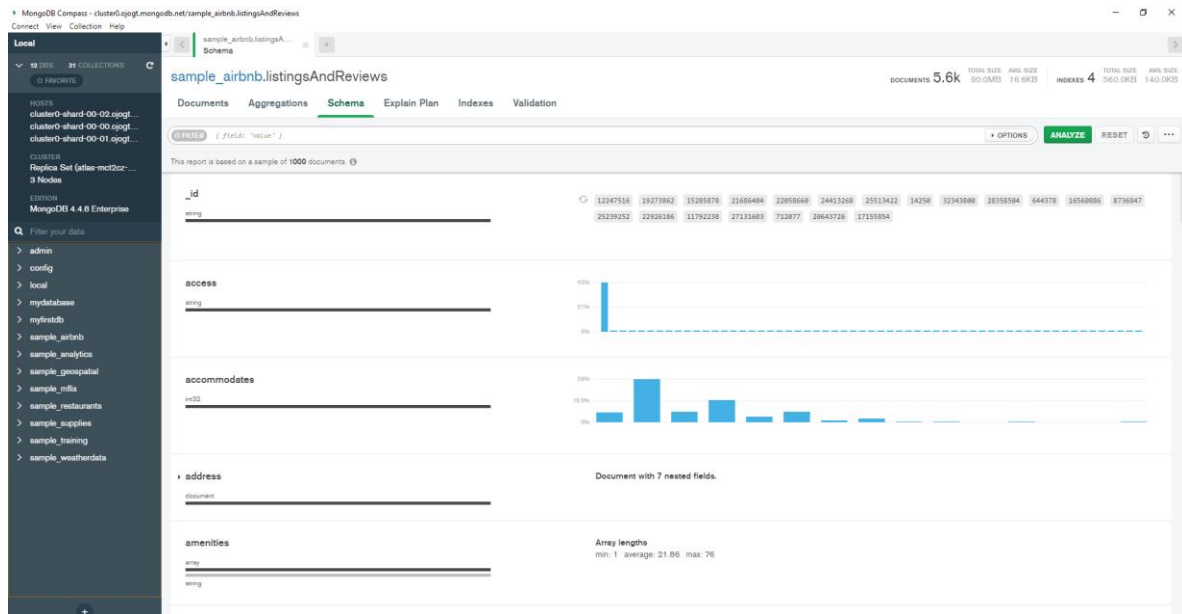
- *city* collection documents



- city collection schema



Examples of Sample Databases



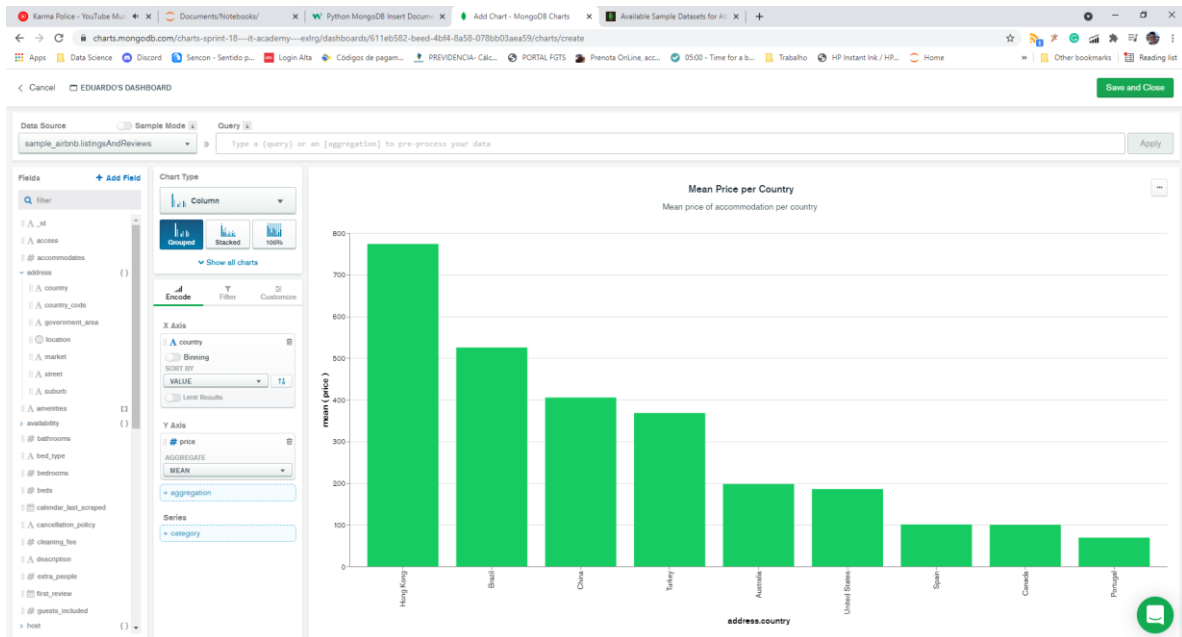
- *sample_airbnb*

The screenshot shows the MongoDB Atlas interface. The left sidebar contains navigation options: DEPLOYMENT, Databases, Triggers, Data Lake, SECURITY, Database Access, Network Access, and Advanced. The main panel displays the 'sample_airbnb.listingsAndReviews' collection. At the top, it shows 'COLLECTION SIZE: 89.99MB', 'TOTAL DOCUMENTS: 5555', and 'INDEXES TOTAL SIZE: 860KB'. Below this, there are tabs for 'Find', 'Indexes', 'Schema Anti-Patterns', 'Aggregation', and 'Search Indexes'. The 'Indexes' tab is active, showing a table of indexes with columns: Name, Definition, and Type; Size; Usage; Properties; and Action. The table lists five indexes: '_id_' (152.0KiB, < 1/min), 'property_type_1_room_type_1_beds_1' (64.0KiB, < 1/min), 'name_1' (248.0KiB, < 1/min), 'address.location_3dsphere' (96.0KiB, < 1/min), and 'address.location' (96.0KiB, < 1/min). Each index has a 'Drop Index' button. A 'CREATE INDEXES' button is also present. The bottom status bar indicates 'System Status: All Good'.

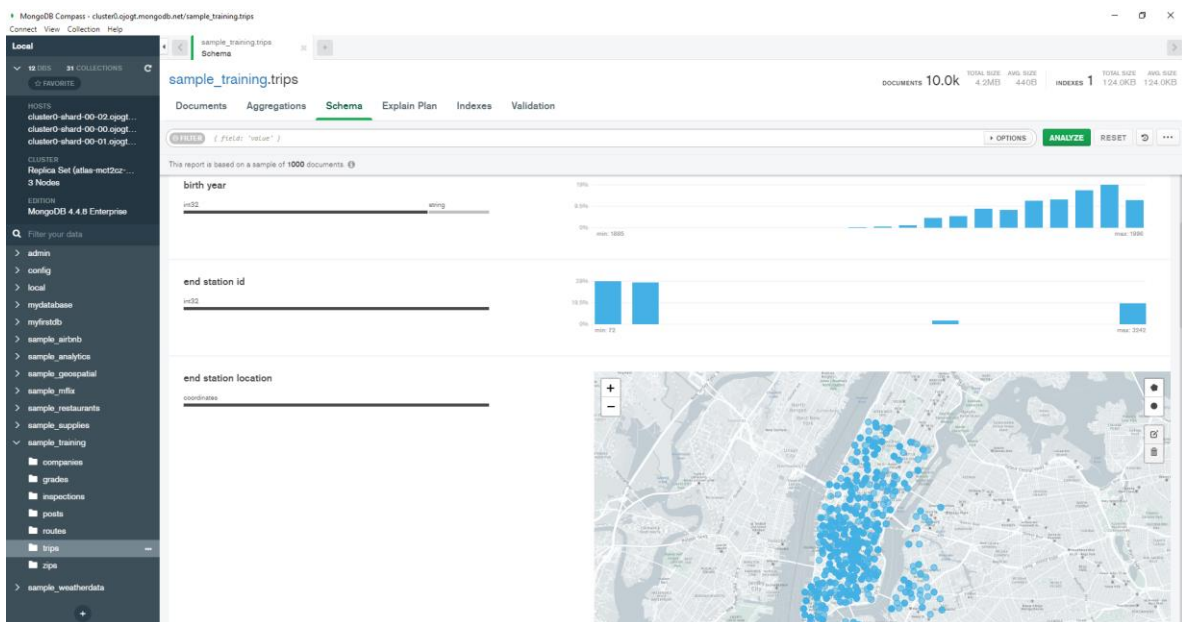
The screenshot shows the MongoDB Compass Schema Explorer for the 'sample_airbnb.listingsAndReviews' collection. The left sidebar shows the database structure with 'sample_airbnb' expanded to show 'listingsAndReviews'. The main panel displays the 'Schema' tab, showing a 'CRUD' (field: 'value') report based on a sample of 1000 documents. The schema details are as follows:

- _id**: String, indexed. Example values: 12345678, 19273842, 15285878, 21686404, 23958669, 34413268, 25113432, 142156, 32343880, 28358504, 644378, 10568884, 8736847.
- access**: String, indexed. Histogram shows a single bar at 100%.
- accommodates**: Integer, indexed. Histogram shows a distribution with a peak at 2.
- address**: Document with 7 nested fields.
- amenities**: Array, indexed. Array lengths: min: 1, average: 21.86, max: 76.

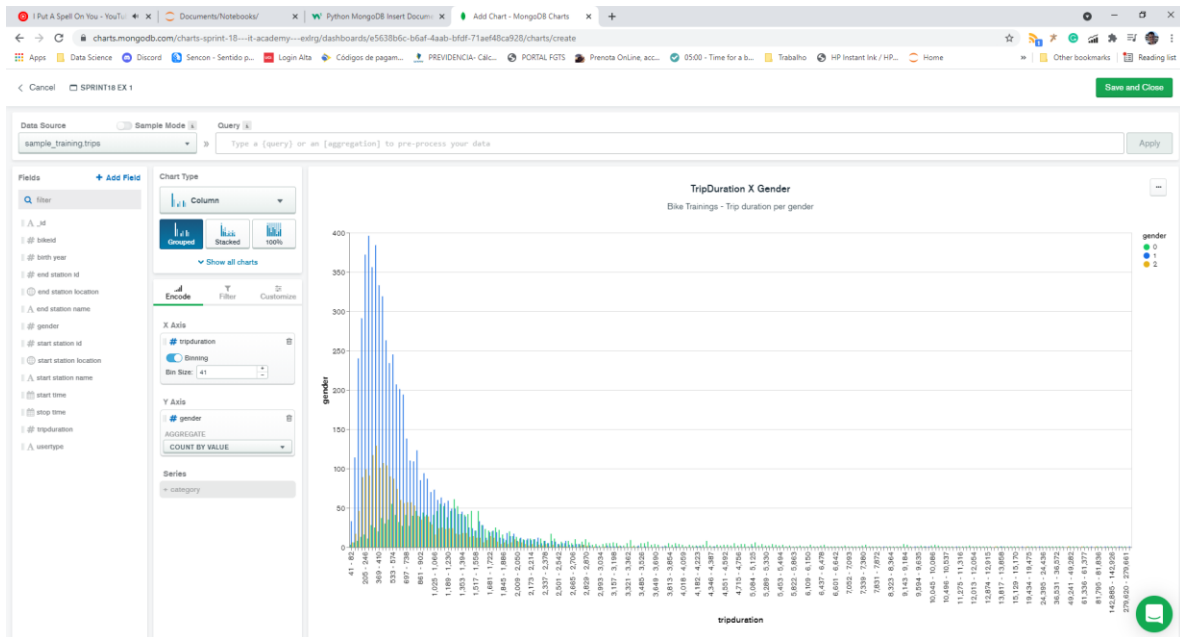
- *sample_airbnb using MongoDB Chart*



- *sample_training*



- *sample_training* Chart



***The rest of the exercises were done in a *Jupyter Notebook* and the file is available on *GitHub*.**