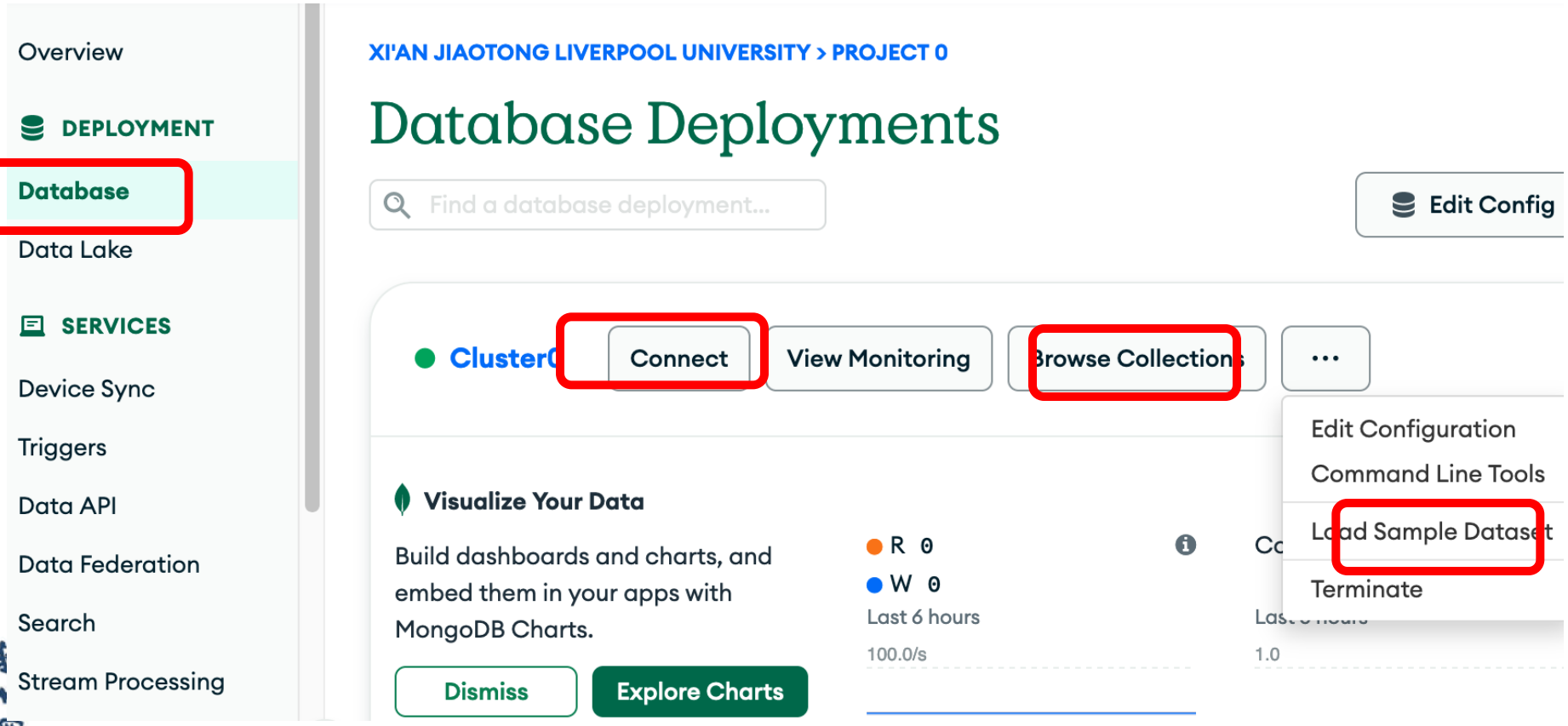
Lab 5 Java and MongoDB

- This lab aims to introduce MongoDB, one of the big data storage systems, and how to use Java to connect to MongoDB for CRUD (Create, Retrieve, Update and Delete) operations.
  - Task 1: Connect to MongoDB
  - Task 2: CRUD operations with MongoDB
  - Task 3: Retrieve data from sample datasets

MongoDB

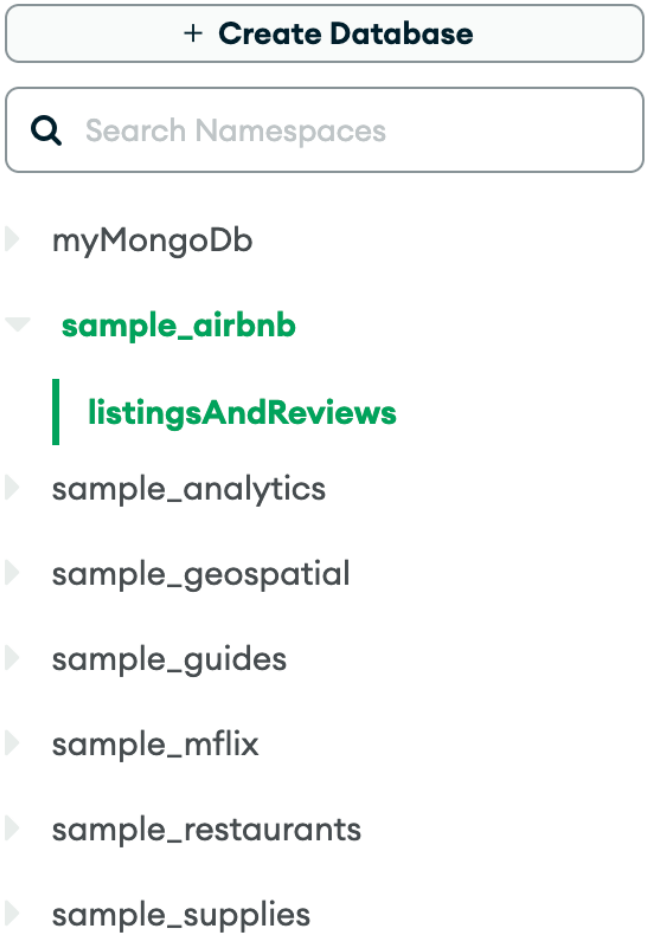
- Use the free cloud MongoDB
  - https://cloud.mongodb.com/v2/
  - Register and do some settings, IP is needed (automatically detected by the cloud)
  - View databases
  - View collections (like tables in relational databases)
  - Learn how to connect to cloud MongoDB

MongoDB Cloud Interface

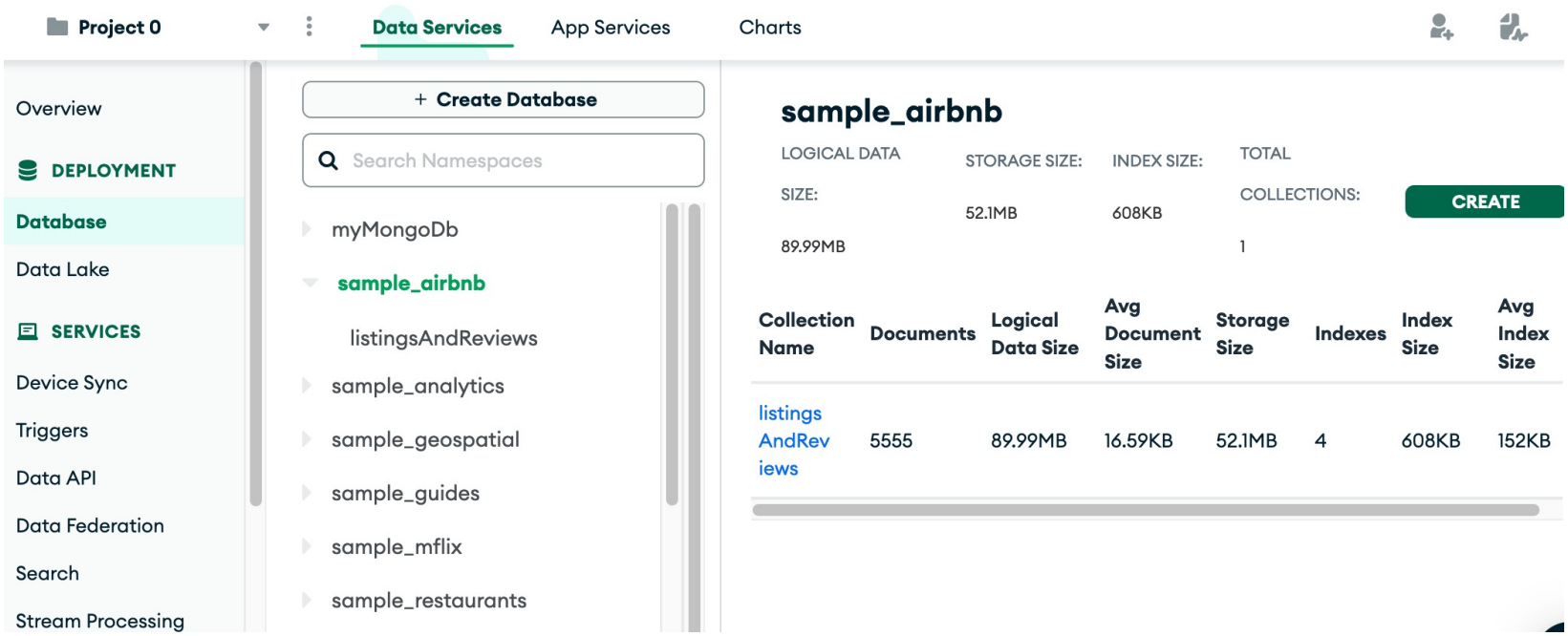


Load Sample Datasets

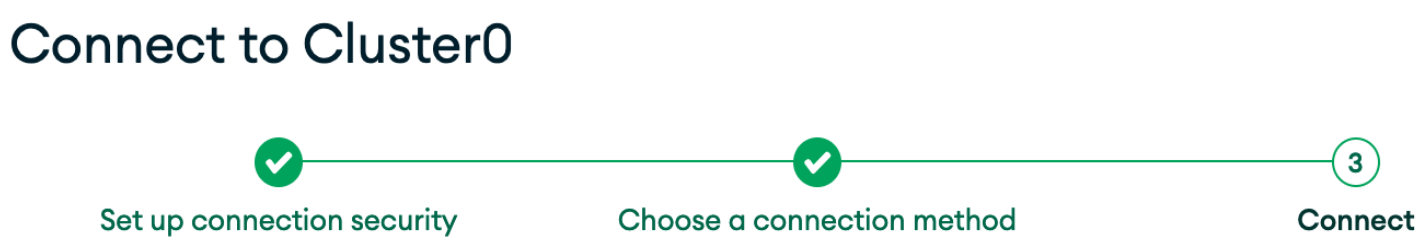
- After registration and login, the database is empty.
- Click 'Load Sample Dataset' (shown in the previous slide) to populate your database.
- After this you will see a number of databases loaded (you should have one called 'sample_airbnb').
- Click on any dataset to browse the collections.



Load Sample Dataset – cont'd



Connect using Java



Connect using Java – cont'd

2. Install your driver

View MongoDB Java Driver installation instructions.

3. Add your connection string into your application code

View full code sample

```
import com.mongodb.ConnectionString;
import com.mongodb.MongoClientSettings;
import com.mongodb.MongoException;
import com.mongodb.ServerApi;
import com.mongodb.ServerApiVersion;
import com.mongodb.client.MongoClient;
import com.mongodb.client.MongoClients;
import com.mongodb.client.MongoDatabase;
import org.bson.Document;

public class MongoClientConnectionExample {
    public static void main(String[] args) {
        String connectionString = "mongodb+srv://WW-CPT201:<password>@cluster0.9iz

        ServerApi serverApi = ServerApi.builder()
                .version(ServerApiVersion.V1)
                .build();
```

Database Preparation

- Task 1: Connect to MongoDB
- Task 2: CRUD operations with MongoDB
- Task 3: Retrieve data from sample dataset (sample_airbnb)

Task 1: Connect to MongoDB

- Set up username and password for your MongoDB
  - The information needs to be provided in your own code.
- Install MongoDB driver
- Read and understand the code in *MongoClientConnectionExample.java*
- Run the program and observe the output.
  - The code tests connection and prints out all databases.
  - Cloud MongoDB only has two default empty databases: admin and local.

Task 2: CRUD operations with MongoDB

- Code for the connection part is the same as that in Task 1.
- Create a database 'myMongoDb' via cloud MongoDB interface and under 'myMongoDb' create a collection 'customers'.
- Read and understand the code in *CRUDExample.java*
- CRUD operations are widely used in RESTful web services.
- Run the program and observe the output.
  - The code tests all four CRUD operations.

Task 3: Retrieve data from sample datasets (5 marks)

- Write a Java file called: *QueryCloudData.java*
- The code should meet the following requirements.
  - Connect to the cloud MongoDB database;
  - Select database sample_airbnb, then its collection called "*listingsAndReviews*";
  - Retrieve a record(s) according to a given query;
    - *name="Private Room in Bushwick"*
  - Print the full record.