

MongoDB Tutorial

MSBA 7024/MACC 7020

What will you learn in this tutorial?

- Create a MongoDB Atlas account and install MongoDB Compass in Windows 10 X64 / Mac
- Compare the concepts in MongoDB with MySQL
- Use MongoDB Compass to import and extract data into/from MongoDB
- Translate basic SQL to codes in MongoDB
- Use Python to import and extract data into/from MongoDB

When to use MongoDB?

- Unstructured data: Not all columns are known before database design. Adding column in SQL is not easy.
- Performance: Real-time analytics and high-speed logging
- Large data volumes: The economic cost of storing large data, especially long strings is much lower.
- Agile development and collaboration: Allow one team to control one part of a document and another team to control another part.

When not to use MongoDB?

- If you're building a simple application
- If you don't have scalability issues with traditional RDBMS
- If you don't have a specific use case to which a NoSQL database might offer a solution to.

Concepts in MongoDB and MySQL

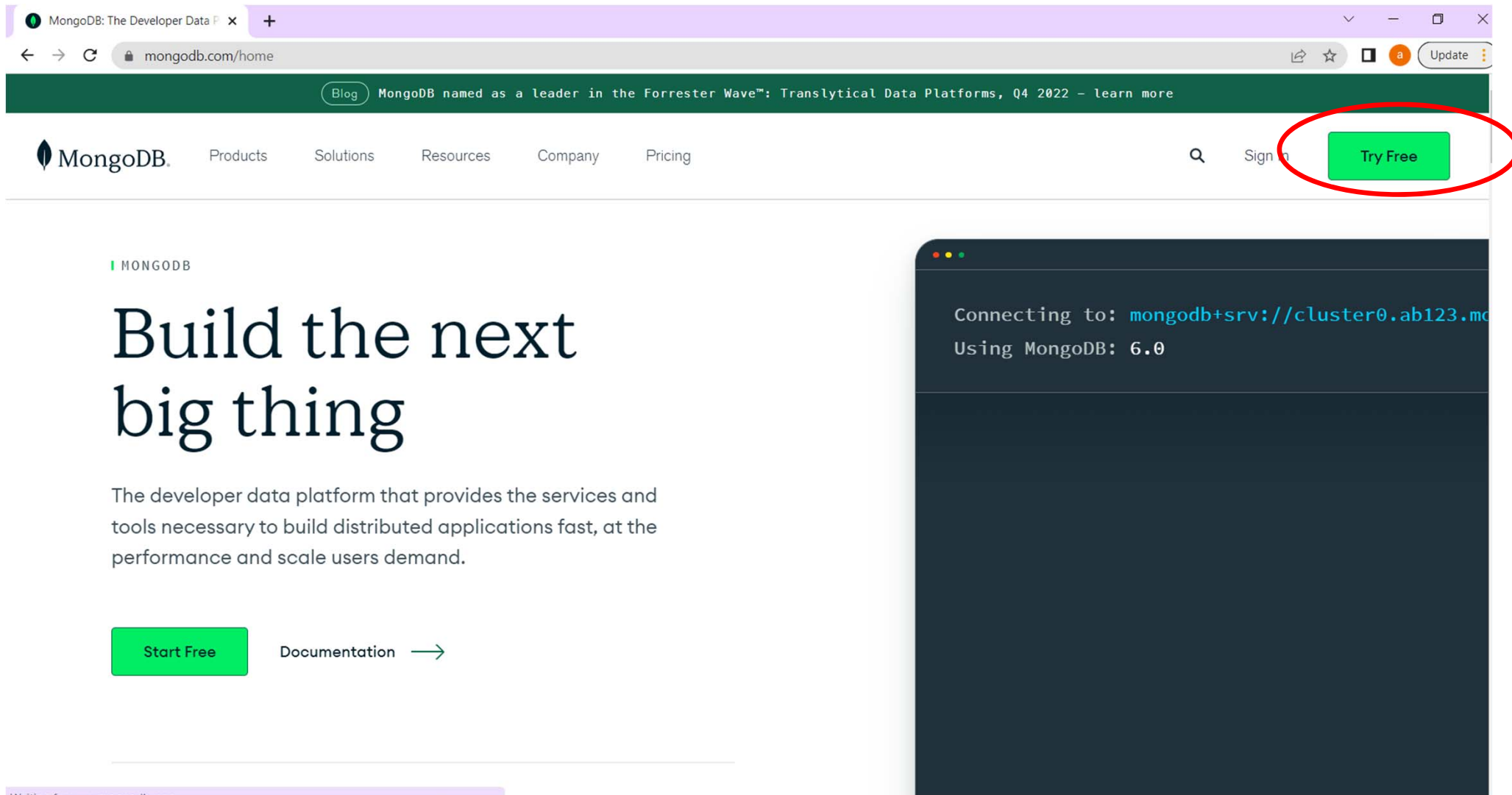
MySQL	MongoDB
Database	Database
Table	Collection
Row	Document
Column	Field
Primary Key	_id field: Auto-generated or user defined

MongoDB Setup and Installation

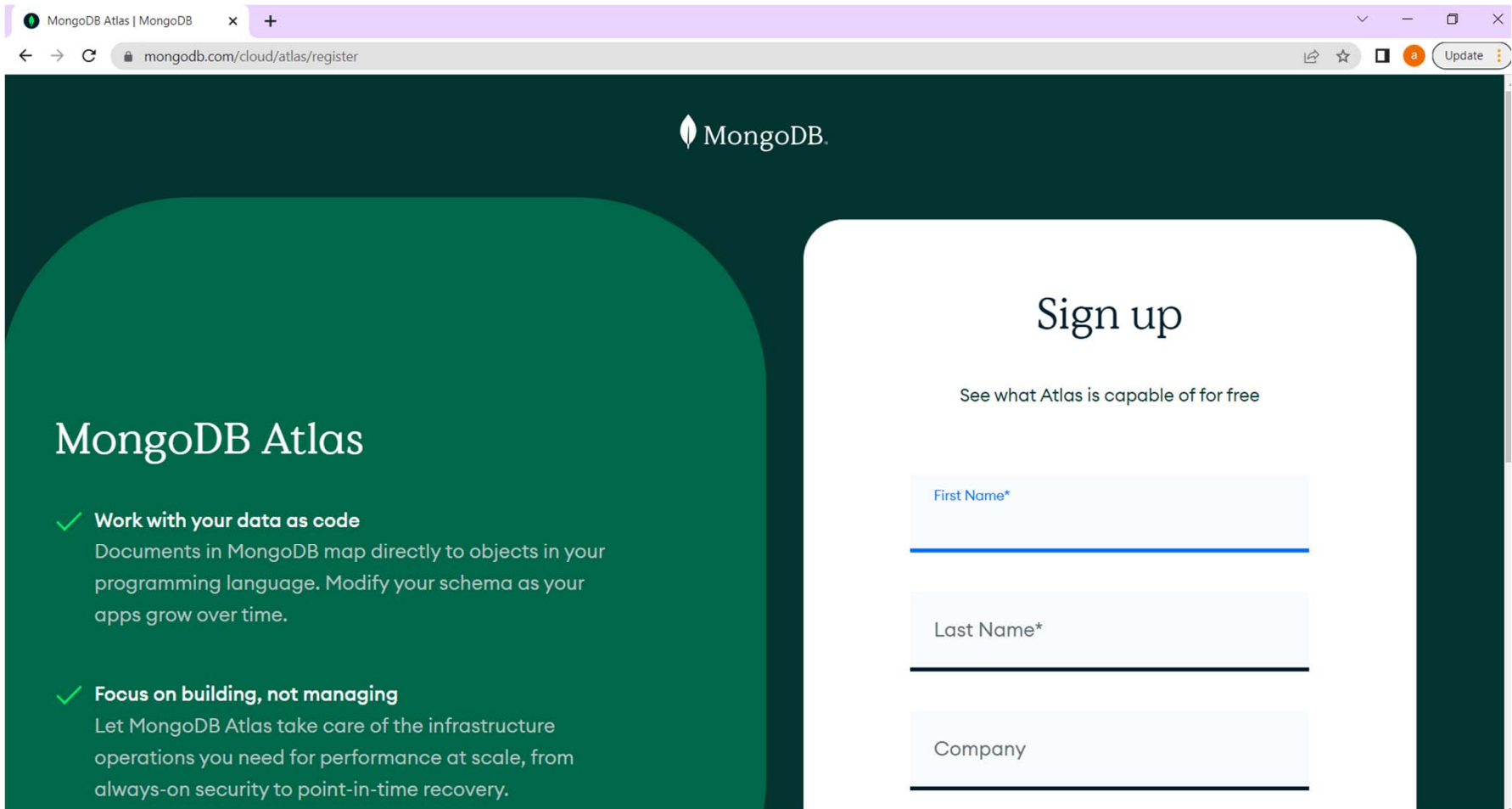
MongoDB Setup

- We will setup
 - A MongoDB account
 - A database cluster on MongoDB Atlas on the cloud
 - MongoDB Compass (the graphical user interface to connect to the database from your computer)

1. Open a web browser, go to mongodb.com Click “Try free” to register an account



2. Fill in the information to sign up



The screenshot shows a web browser window with the URL `mongodb.com/cloud/atlas/register`. The page has a dark green header with the MongoDB logo. The main content area is split into two sections. On the left, a dark green rounded rectangle contains the text 'MongoDB Atlas' and two bullet points, each preceded by a green checkmark. On the right, a white rounded rectangle contains the 'Sign up' heading, a subtext 'See what Atlas is capable of for free', and three input fields labeled 'First Name*', 'Last Name*', and 'Company'.

MongoDB Atlas

- ✓ **Work with your data as code**
Documents in MongoDB map directly to objects in your programming language. Modify your schema as your apps grow over time.
- ✓ **Focus on building, not managing**
Let MongoDB Atlas take care of the infrastructure operations you need for performance at scale, from always-on security to point-in-time recovery.

Sign up

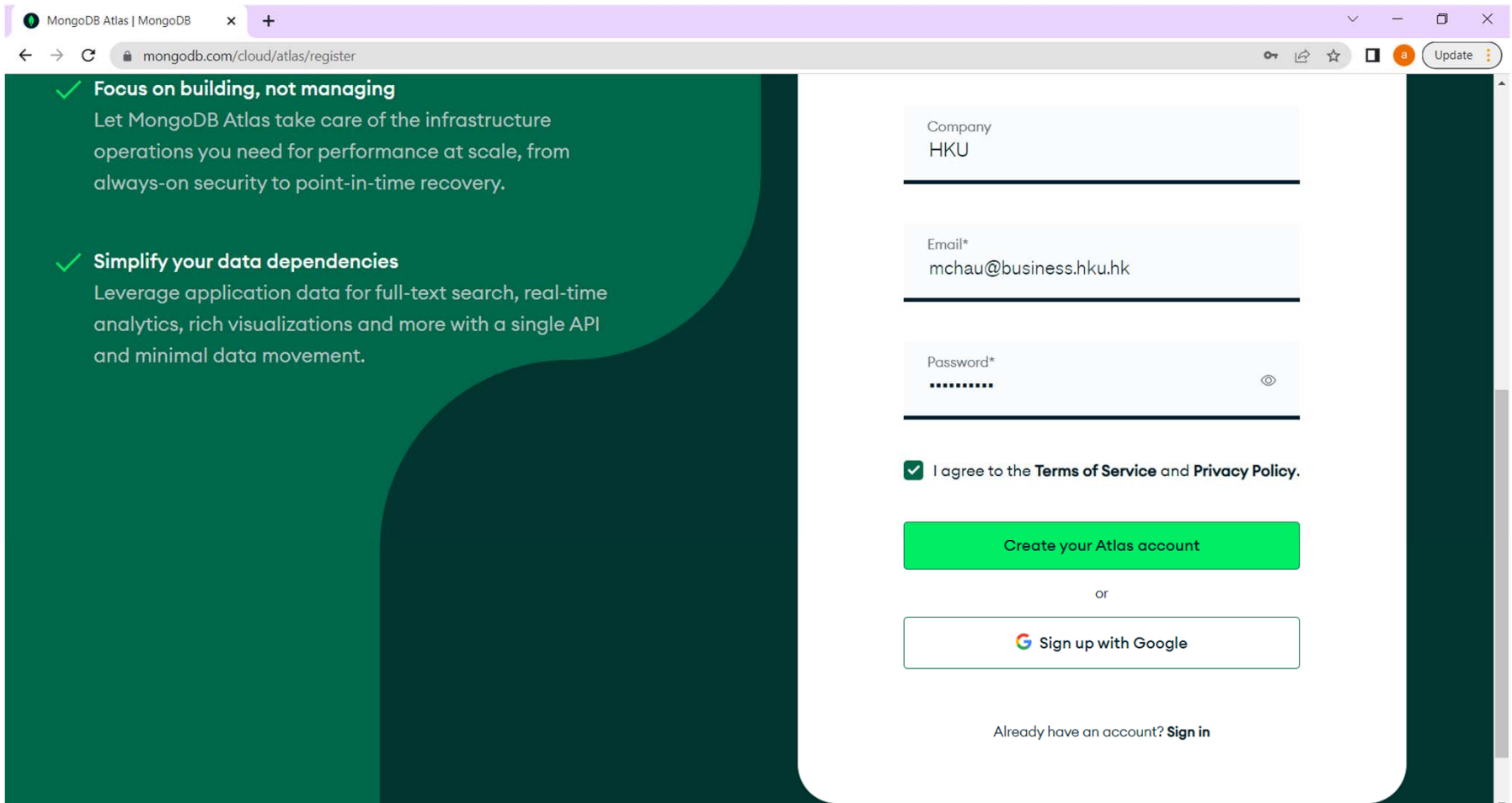
See what Atlas is capable of for free

First Name*

Last Name*

Company

2. Fill in the information to sign up



The screenshot shows the MongoDB Atlas registration page in a web browser. The browser's address bar displays 'mongodb.com/cloud/atlas/register'. The page is divided into two main sections. On the left, a dark green background features two white checkmarks and text. The first checkmark is next to the heading 'Focus on building, not managing', followed by the text 'Let MongoDB Atlas take care of the infrastructure operations you need for performance at scale, from always-on security to point-in-time recovery.' The second checkmark is next to the heading 'Simplify your data dependencies', followed by the text 'Leverage application data for full-text search, real-time analytics, rich visualizations and more with a single API and minimal data movement.' On the right, a white registration form is set against a dark green background. It contains three input fields: 'Company' with the value 'HKU', 'Email*' with the value 'mchau@business.hku.hk', and 'Password*' with masked characters and a toggle eye icon. Below these fields is a checkbox labeled 'I agree to the Terms of Service and Privacy Policy.' which is checked. A bright green button labeled 'Create your Atlas account' is positioned below the checkbox. Underneath the button is the word 'or' and a button with the Google logo and the text 'Sign up with Google'. At the bottom of the form, the text 'Already have an account? Sign in' is displayed.

✓ **Focus on building, not managing**
Let MongoDB Atlas take care of the infrastructure operations you need for performance at scale, from always-on security to point-in-time recovery.

✓ **Simplify your data dependencies**
Leverage application data for full-text search, real-time analytics, rich visualizations and more with a single API and minimal data movement.

Company
HKU


Email*
mchau@business.hku.hk

Password*
.....

☒ I agree to the **Terms of Service** and **Privacy Policy**.

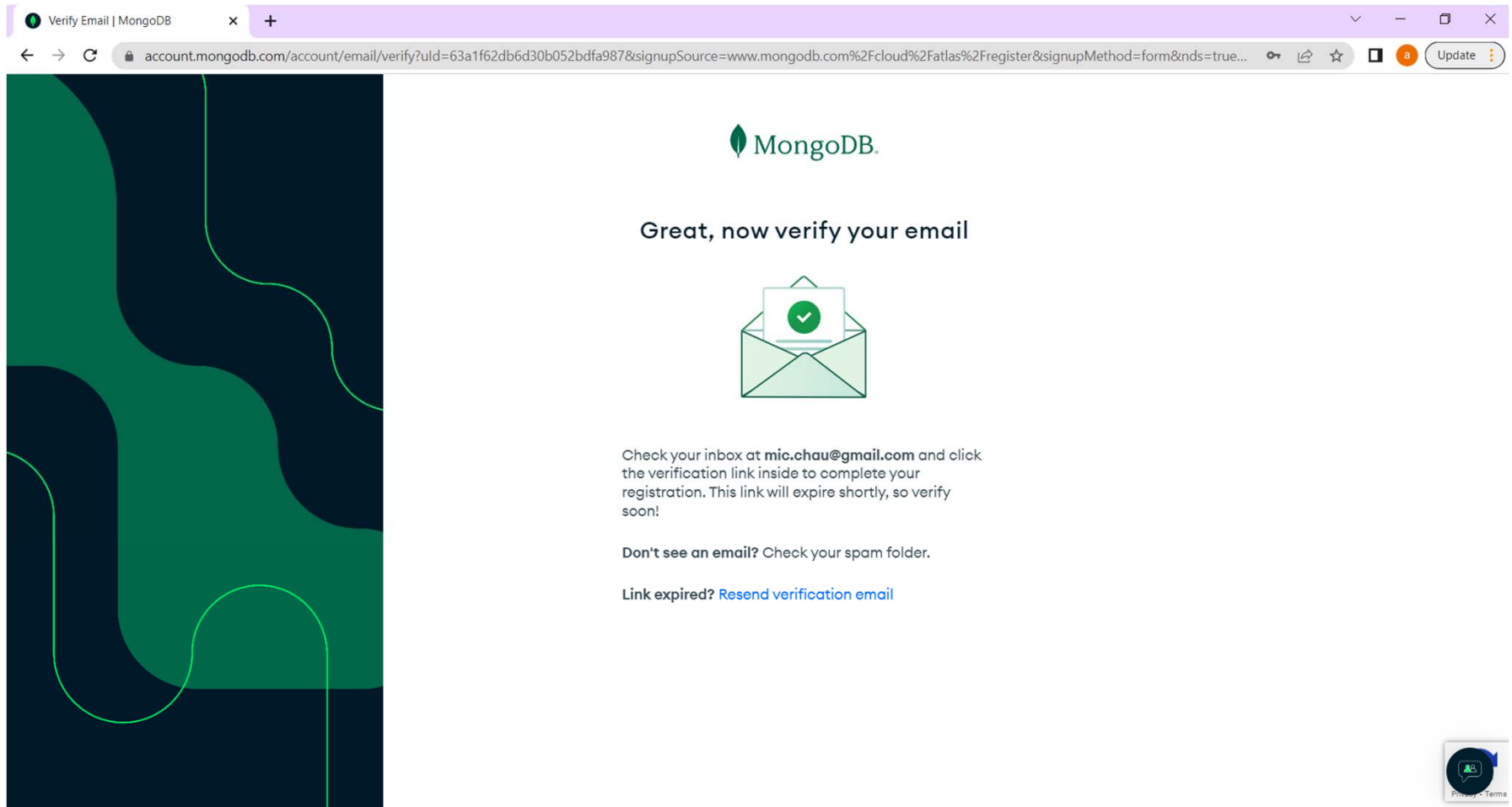
Create your Atlas account

or

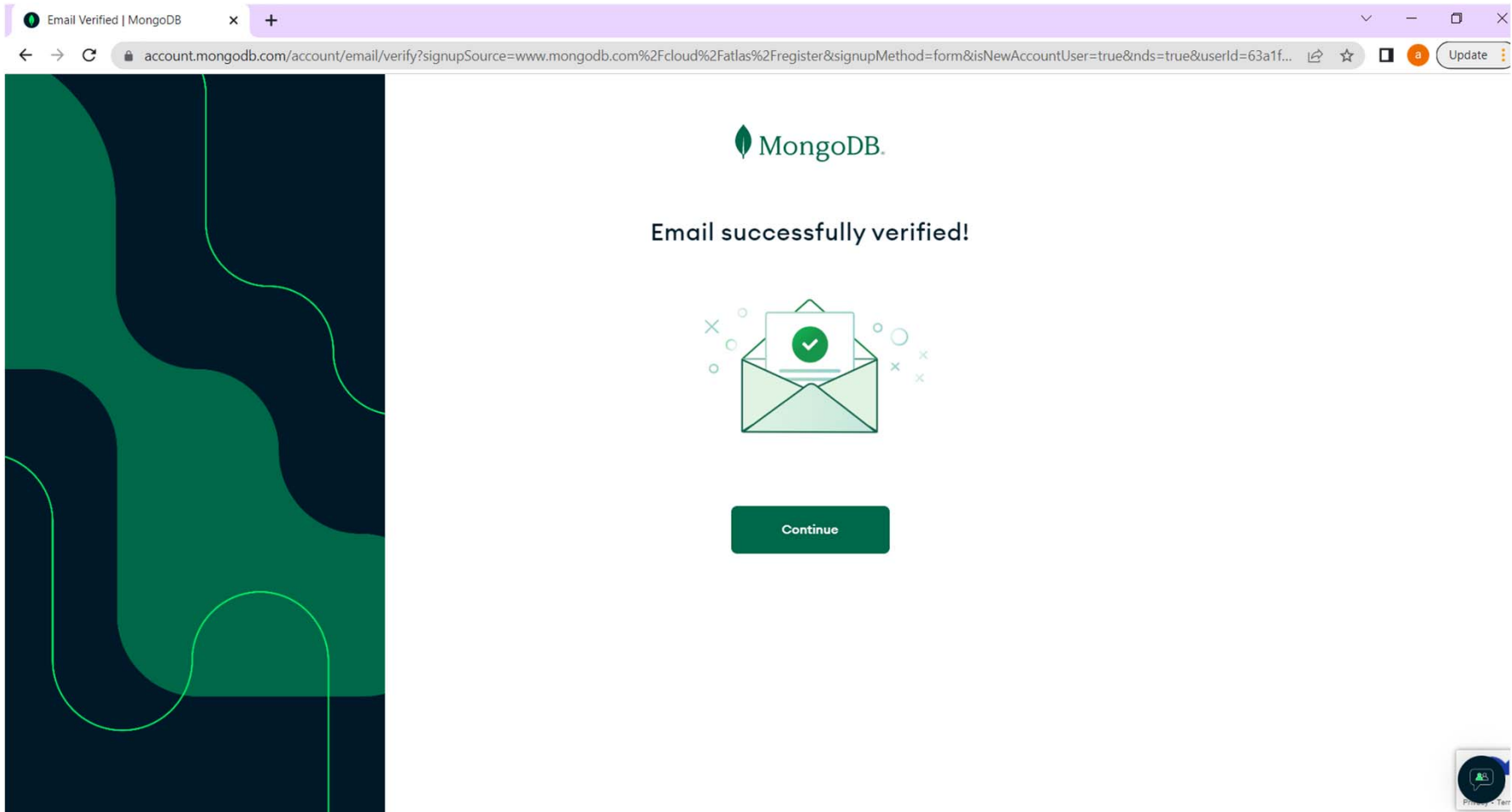
 Sign up with Google

Already have an account? [Sign in](#)

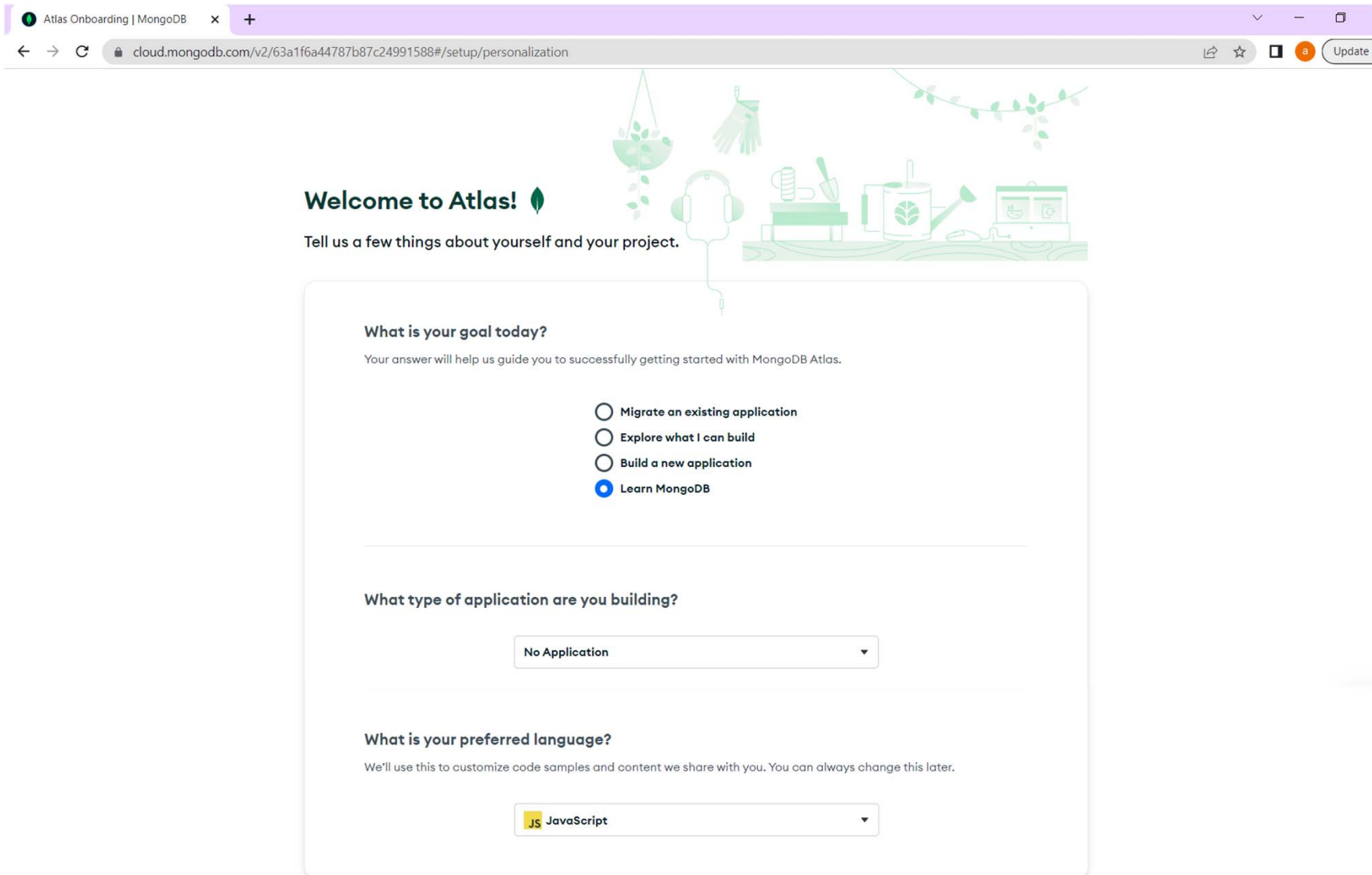
3. Login to your email account and look for the verification email



In the verification email, click “Verify Email”, then click “Continue”



4. In the survey, you may choose “Learn MongoDB”, “No Application” and “JavaScript” Then click “Finish”



The screenshot shows the MongoDB Atlas Onboarding survey interface in a web browser. The browser's address bar displays the URL: `cloud.mongodb.com/v2/63a1f6a44787b87c24991588#/setup/personalization`. The page features a green-themed header with the text "Welcome to Atlas!" and a small leaf icon. Below the header, a decorative illustration shows a pair of green gloves, a watering can, and a small garden scene. The main content area is a white box with a light green border, containing three sections of the survey:

- What is your goal today?**
Your answer will help us guide you to successfully getting started with MongoDB Atlas.
 - ☐ Migrate an existing application
 - ☐ Explore what I can build
 - ☐ Build a new application
 - ☒ Learn MongoDB
- What type of application are you building?**
A dropdown menu is shown with the selected option: "No Application".
- What is your preferred language?**
We'll use this to customize code samples and content we share with you. You can always change this later.
A dropdown menu is shown with the selected option: "JS JavaScript".

5. Click “Create” in the “Shared” section

The screenshot shows the MongoDB Atlas 'Choose a Path' interface. On the left, the MongoDB logo and 'MONGODB ATLAS' are displayed above the heading 'Deploy a cloud database'. Below this, it says 'Experience the best of MongoDB on AWS, Azure, and Google Cloud. Choose a deployment option to get started.'

Three deployment options are presented in cards:

- NEW Serverless**: For application development and testing, or workloads with variable traffic. Minimal configuration required. Features include: Pay only for the operations you run, Resources scale seamlessly to meet your workload, and Always-on security and backups. The 'Create' button is outlined in green. Starting at \$0.10/1M reads.
- ADVANCED Dedicated**: For production applications with sophisticated workload requirements. Advanced configuration controls. Features include: Network isolation and fine-grained access controls, On-demand performance advice, and Multi-region and multi-cloud options available. The 'Create' button is outlined in green. Starting at \$0.08/hr* (estimated cost \$56.94/month).
- FREE Shared**: For learning and exploring MongoDB in a cloud environment. Basic configuration options. Features include: No credit card required to start, Explore with sample datasets, and Upgrade to dedicated clusters for full functionality. The entire card is enclosed in a green border, and the 'Create' button is highlighted with a red circle. The 'Create' button is solid green. Starting at **FREE**.

At the bottom, there are links for 'I'll do this later', 'View all features', and 'Advanced Configuration Options'.

6. Choose a Cloud Provider available in your area

CLUSTERS > CREATE A SHARED CLUSTER

Create a Shared Cluster

Welcome to MongoDB Atlas! We've recommended some of our most popular options, but feel free to customize your cluster to your needs. For more information, check our [documentation](#).

Serverless Dedicated **FREE Shared**

For learning and exploring MongoDB in a sandbox environment. Basic configuration controls.
No credit card required to start. Upgrade to dedicated clusters for full functionality.
Explore with sample datasets. Limit of one free cluster per project.

Cloud Provider & Region

AWS, Hong Kong (ap-east-1) ^

aws Google Cloud Azure

★ Recommended region ⓘ ☑ Dedicated tier region ⓘ

NORTH AMERICA	EUROPE	AUSTRALIA
N. Virginia (us-east-1) ★	Stockholm (eu-north-1) ★	Sydney (ap-southeast-2) ★
Oregon (us-west-2) ★	Frankfurt (eu-central-1)	ASIA
Ohio (us-east-2) ★ ☑	Paris (eu-west-3) ★	Singapore (ap-southeast-1) ★
N. California (us-west-1) ☑	Ireland (eu-west-1) ★	Hong Kong (ap-east-1) ★
Montreal (ca-central-1) ★ ☑	London (eu-west-2) ★ ☑	Seoul (ap-northeast-2) ★
SOUTH AMERICA	Milan (eu-south-1) ★ ☑	Tokyo (ap-northeast-1) ★
Sao Paulo (sa-east-1) ★		Mumbai (ap-south-1) ★

FREE Free forever! Your M0 cluster is ideal for experimenting in a limited sandbox. You can upgrade to a production cluster anytime.

Back **Create Cluster**

Use the default settings and click “Create Cluster” at the bottom

The screenshot shows the 'Create Deployment' page in the MongoDB Cloud console. The browser address bar indicates the URL: `cloud.mongodb.com/v2/63a1f6a44787b87c24991588#/clusters/edit?filter=starter&fromPathSelector=true`. The page is titled 'Create Deployment | Cloud: Mon' and shows a user profile 'Michael' in the top right corner.

The configuration section includes the following options:

- Region:** AFRICA (selected), with sub-regions Osaka (ap-northeast-3) and Cape Town (af-south-1) listed.
- Cluster Tier:** M0 Sandbox (Shared RAM, 512 MB Storage) (selected), with 'Encrypted' status.
- Additional Settings:** MongoDB 5.0, No Backup (selected).
- Cluster Name:** Cluster0 (selected).

At the bottom of the page, there is a 'FREE' badge and a note: 'Free forever! Your M0 cluster is ideal for experimenting in a limited sandbox. You can upgrade to a production cluster anytime.' To the right of this note is a 'Back' link and a green 'Create Cluster' button, which is circled in red. A 'Privacy - Terms' link is visible in the bottom left corner, and a chat icon is in the bottom right corner.

7. Select “Username and Password”
Input “user1” in Username
Input “hku” in Password
Then click “Create User”

The screenshot shows the MongoDB Atlas Security Quickstart page. The left sidebar has a 'SECURITY' section with a 'Quickstart' sub-section. The main content area is titled 'Security Quickstart' and asks 'How would you like to authenticate your connection?'. Two options are shown: 'Username and Password' (selected and circled in red) and 'Certificate'. Below this, a form for creating a database user is displayed. The 'Username' field contains 'user1' (circled in red), the 'Password' field contains 'hku' (circled in red), and the 'Create User' button is circled in red. The interface also includes a top navigation bar with 'Atlas', 'HKU', 'Access Manager', and 'Billing' links, and a bottom status bar with 'New On Atlas' and 'Goto' links.

Security Quickstart | MongoDB x +

cloud.mongodb.com/v2/63a1f6a44787b87c24991588#/setup/access?includeToast=true

Atlas HKU Access Manager Billing

All Clusters Get Help Michael

Project 0 Data Services App Services Charts

DEPLOYMENT

Database

Data Lake PREVIEW

SERVICES

Triggers

Data API

Data Federation

SECURITY

Quickstart

Database Access

Network Access

Advanced

New On Atlas 5

Goto

HKU > PROJECT 0

Security Quickstart

To access data stored in Atlas, you'll need to create users and set up network security controls. [Learn more about security setup](#)

1 How would you like to authenticate your connection?

Your first user will have permission to read and write any data in your project.

Username and Password Certificate

Create a database user using a username and password. Users will be given the *read and write to any database privilege* by default. You can update these permissions and/or create additional users later. Ensure these credentials are different to your MongoDB Cloud username and password.

Username

user1

Password

hku

Autogenerate Secure Password Copy

Create User

8. Select “My Local Environment” Input “0.0.0.0/0” in IP Address Then click “Add Entry”

Security Quickstart | MongoDB

cloud.mongodb.com/v2/63a1f6a44787b87c24991588#/setup/access?includeToast=true

Atlas HKU Access Manager Billing All Clusters Get Help Michael

Project 0 Data Services App Services Charts

2 Where would you like to connect from?

Enable access for any network(s) that need to read and write data to your cluster.

My Local Environment
Use this to add network IP addresses to the IP Access List. This can be modified at any time.

Cloud Environment
Use this to configure network access between Atlas and your cloud or on-premise environment. Specifically, set up IP Access Lists, Network Peering, and Private Endpoints. ADVANCED

Add entries to your IP Access List

Only an IP address you add to your Access List will be able to connect to your project's clusters.

IP Address	Description
0.0.0.0/0	Enter description

Add My Current IP Address

Add Entry

Finish and Close

System Status: All Good

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Click “Finish and Close”

Security Quickstart | MongoDB

cloud.mongodb.com/v2/63a1f6a44787b87c24991588#/setup/access?includeToast=true

Atlas HKU Access Manager Billing All Clusters Get Help Michael

Project 0 Data Services App Services Charts

DEPLOYMENT

- Database
- Data Lake **PREVIEW**

SERVICES

- Triggers
- Data API
- Data Federation

SECURITY

- Quickstart**
- Database Access
- Network Access
- Advanced

New On Atlas 5 Goto

My Local Environment

Use this to add network IP addresses to the IP Access List. This can be modified at any time.

Cloud Environment

Use this to configure network access between Atlas and your cloud or on-premise environment. Specifically, set up IP Access Lists, Network Peering, and Private Endpoints.

Add entries to your IP Access List

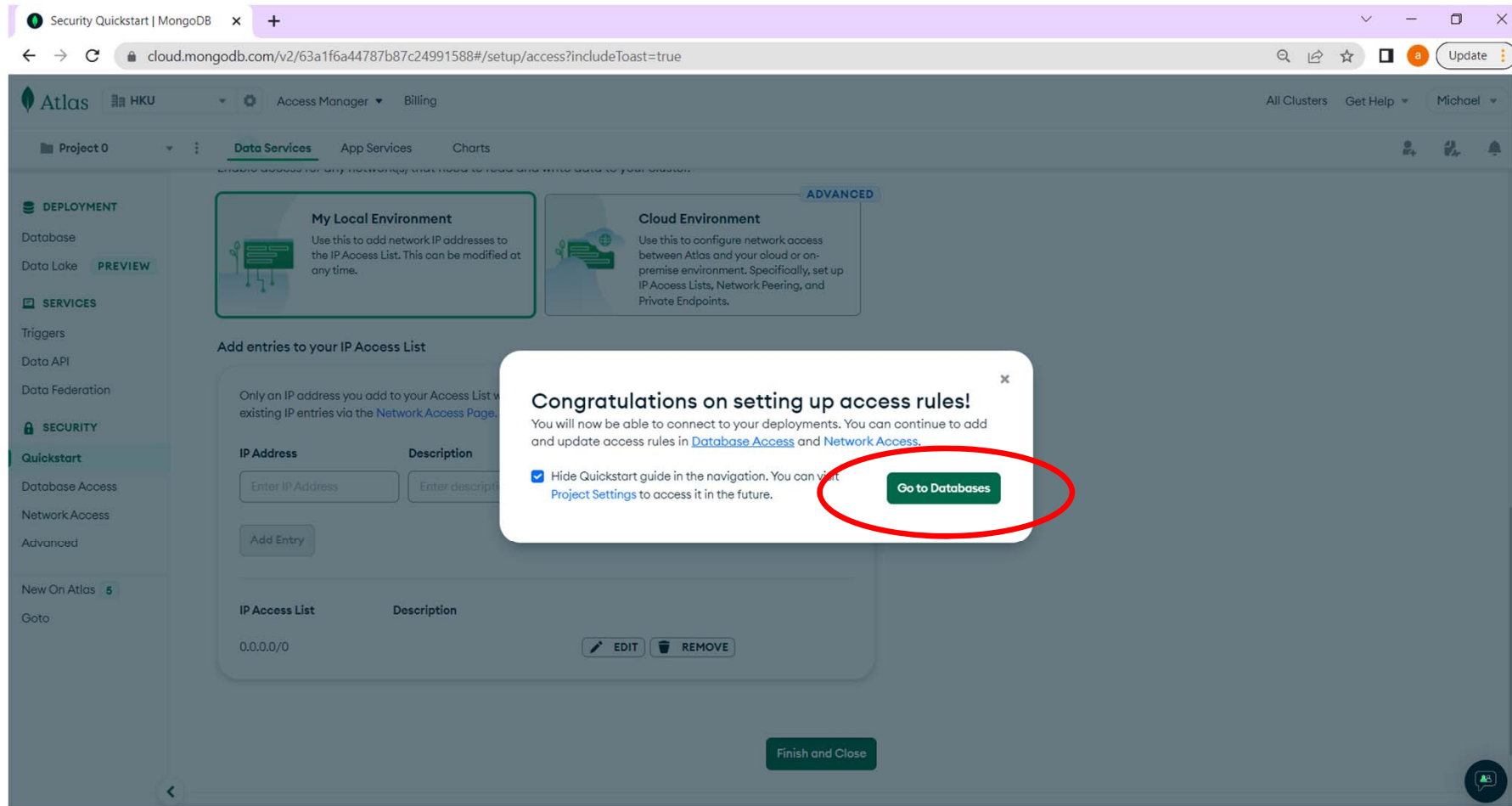
Only an IP address you add to your Access List will be able to connect to your project's clusters. You can manage existing IP entries via the [Network Access Page](#).

IP Address	Description
<input type="text" value="Enter IP Address"/>	<input type="text" value="Enter description"/>
<input type="button" value="Add My Current IP Address"/>	
<input type="button" value="Add Entry"/>	

IP Access List	Description
0.0.0.0/0	<input type="button" value="EDIT"/> <input type="button" value="REMOVE"/>

Finish and Close

Click “Go to Databases”



11. Click “Connect”

The screenshot shows the MongoDB Atlas interface for a specific project. The left sidebar contains navigation links for Deployment, Services, and Security. The main content area is titled 'Database Deployments' and includes a search bar, a 'Create' button, and a section for 'Cluster0'. The 'Cluster0' section has a 'Connect' button circled in red, along with 'View Monitoring' and 'Browse Collections' buttons. Below this, there are performance metrics for Read (R), Write (W), Connections, In/Out B/s, and Data Size. At the bottom, a table lists cluster details.

Database Deployments

Find a database deployment...

Cluster0 **Connect** **View Monitoring** **Browse Collections** ... **FREE** **SHARED**

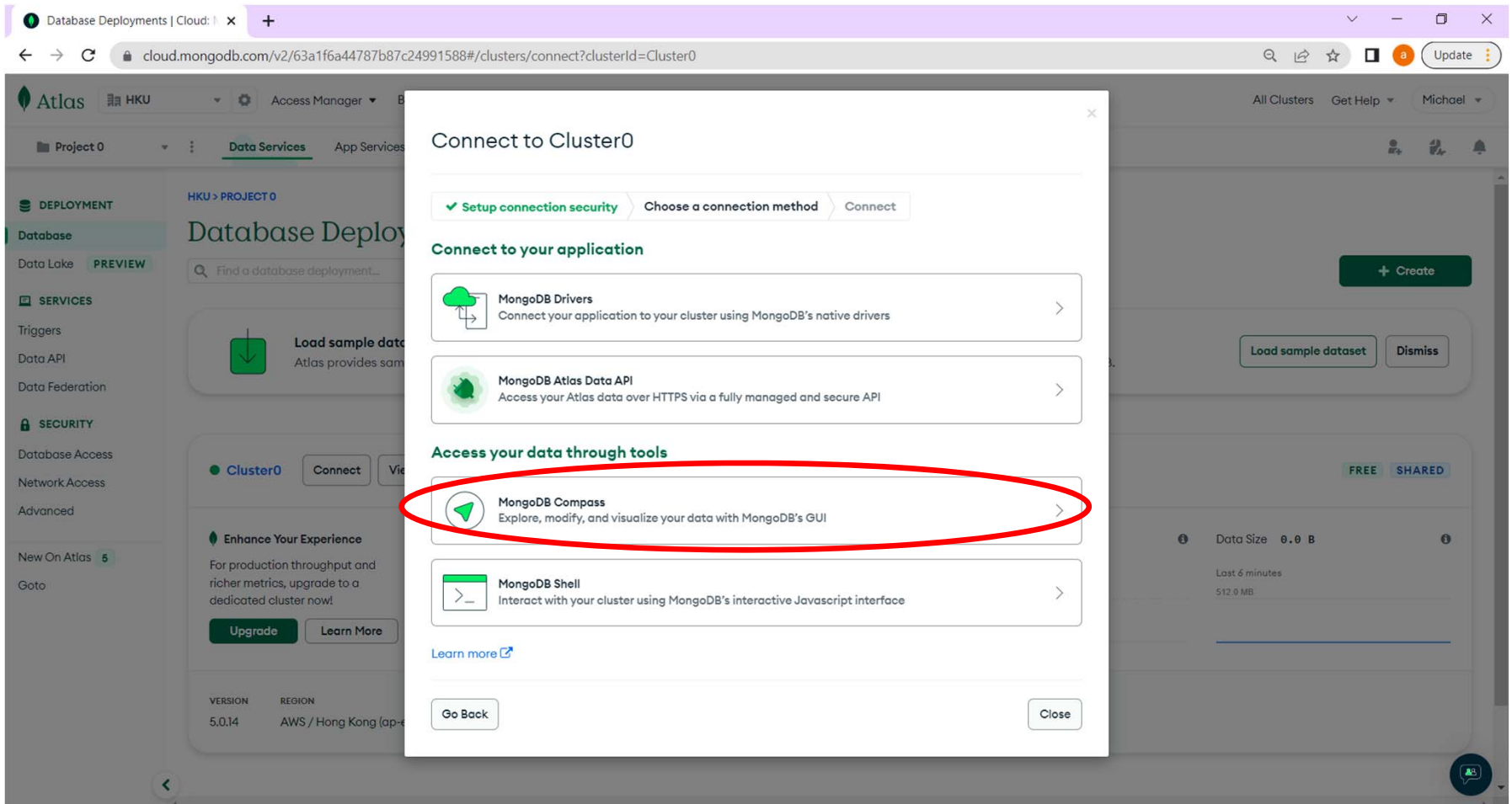
Enhance Your Experience
For production throughput and richer metrics, upgrade to a dedicated cluster now!
Upgrade **Learn More**

Performance Metrics:

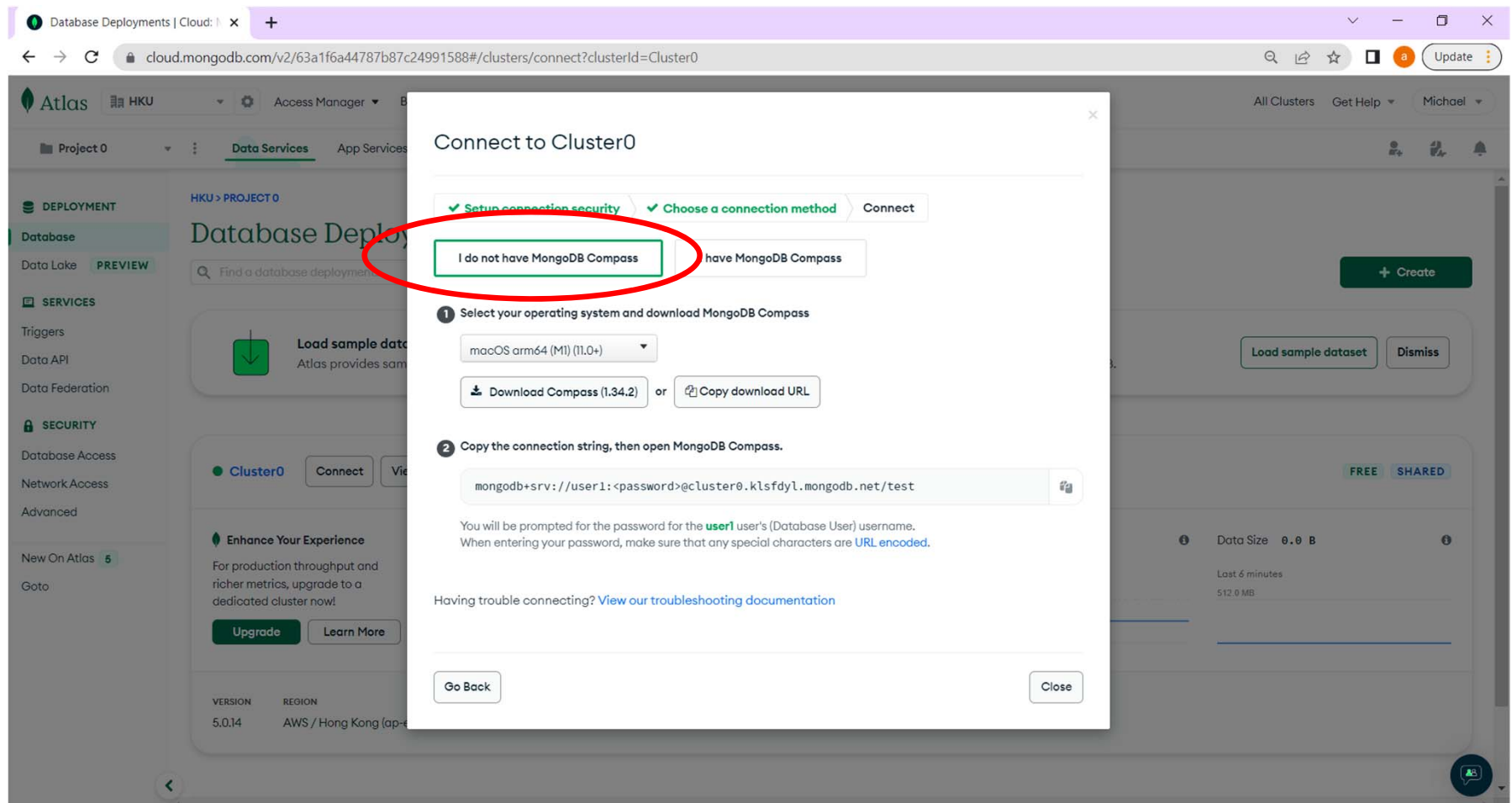
- R 0** (Last 21 seconds: 100.0/s)
- W 0** (Last 21 seconds: 100.0/s)
- Connections 0** (Last 6 minutes: 100.0)
- In 0.0 B/s** (Last 21 seconds: 100.0 B/s)
- Out 0.0 B/s** (Last 21 seconds: 100.0 B/s)
- Data Size 0.0 B** (Last 6 minutes: 512.0 MB)

VERSION	REGION	CLUSTER TIER	TYPE	BACKUPS	LINKED APP SERVICES	ATLAS SEARCH
5.0.14	AWS / Hong Kong (ap-east-1)	M0 Sandbox (General)	Replica Set - 3 nodes	Inactive	None Linked	Create Index

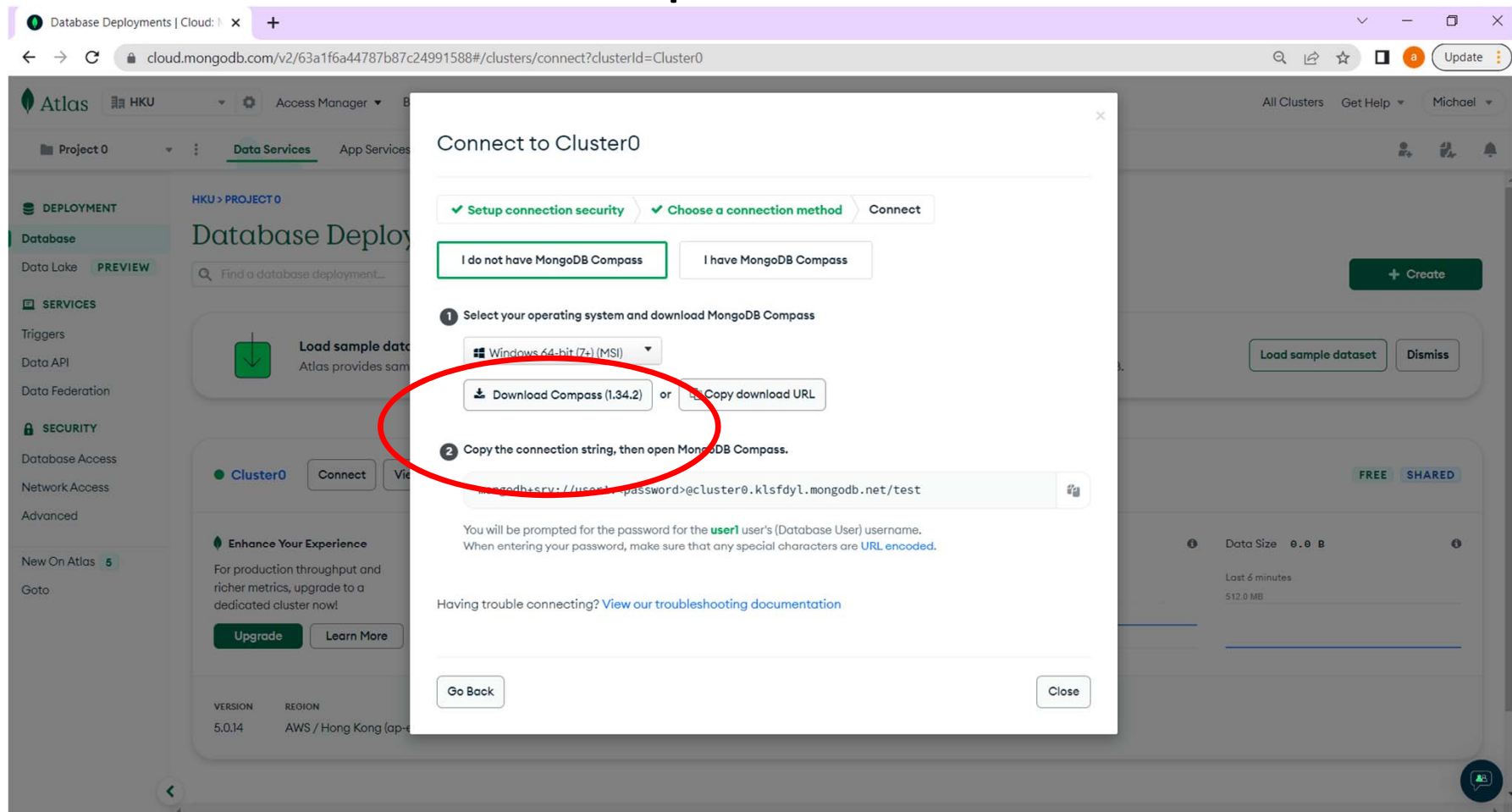
Choose “MongoDB Compass”



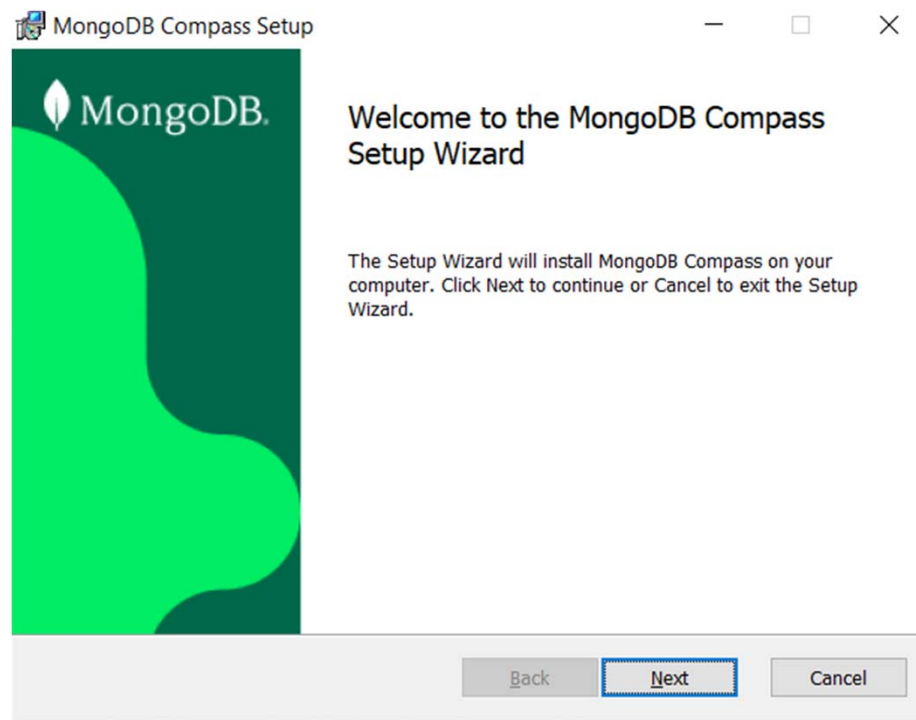
Choose “I do not have MongoDB Compass”



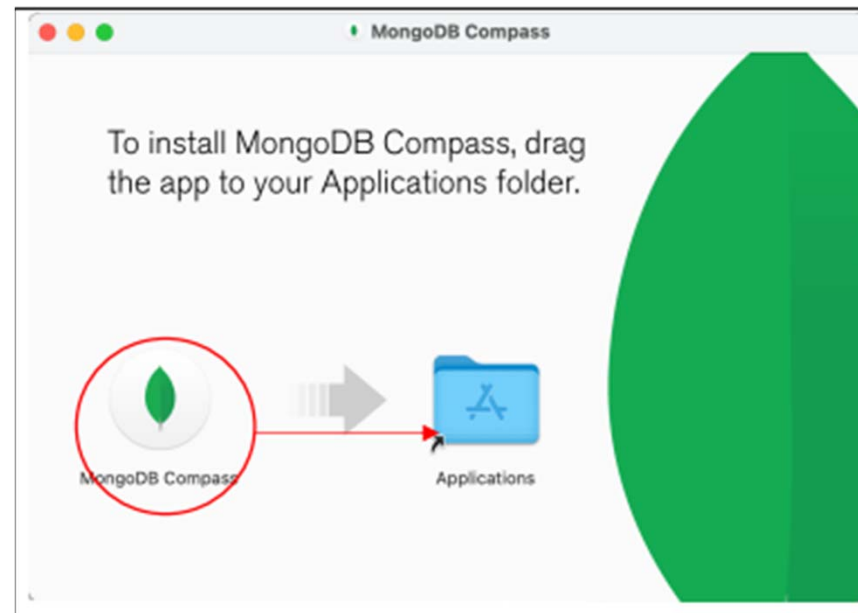
12. Just for the first time, select your operating system and click “Download Compass”



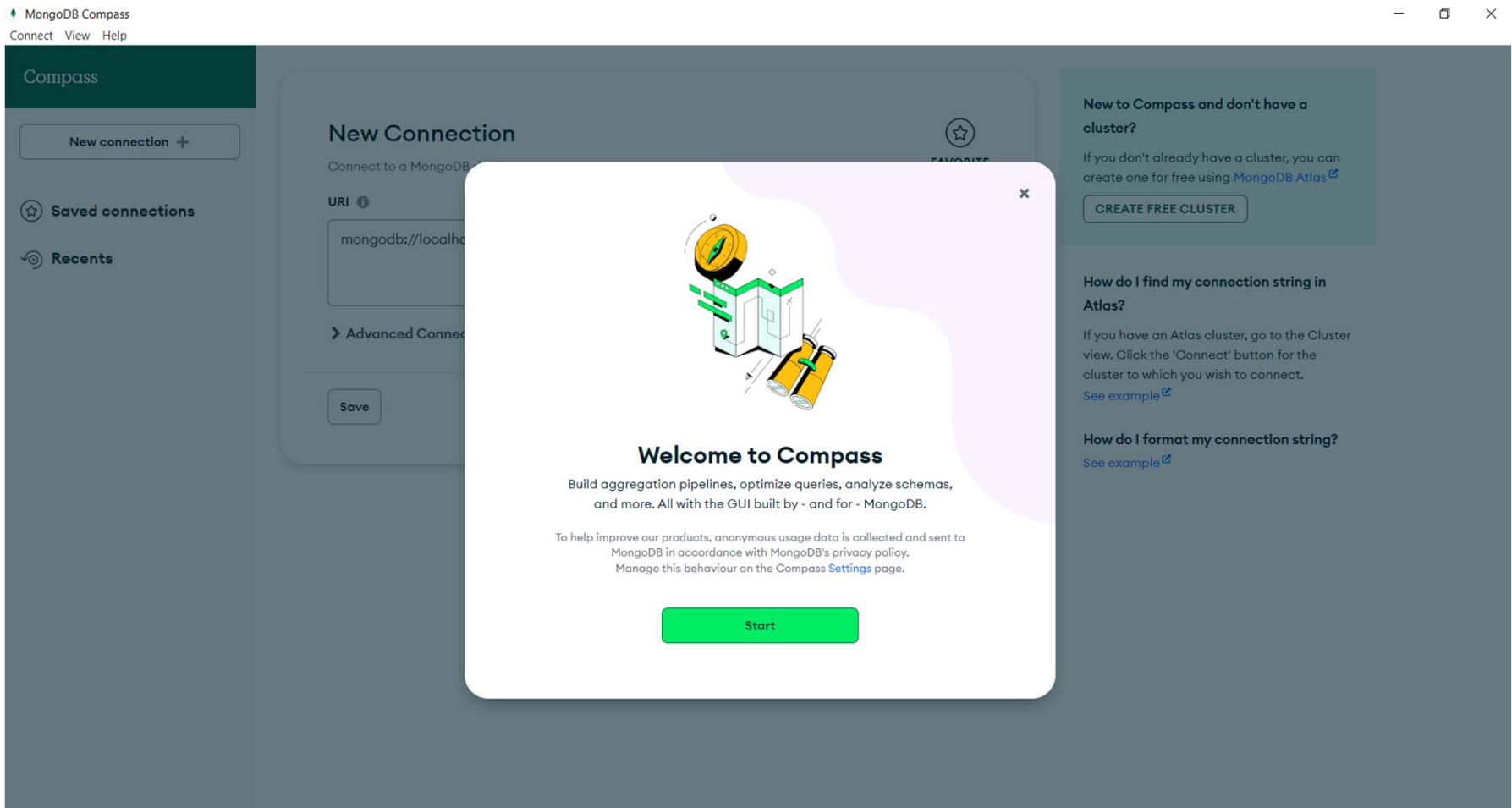
For Windows users, run the downloaded file and choose the default settings during installation



For Mac users, double click the file to extract it
Then drag the icon to the shortcut of Applications
Then start the MongoDB Compass in Applications

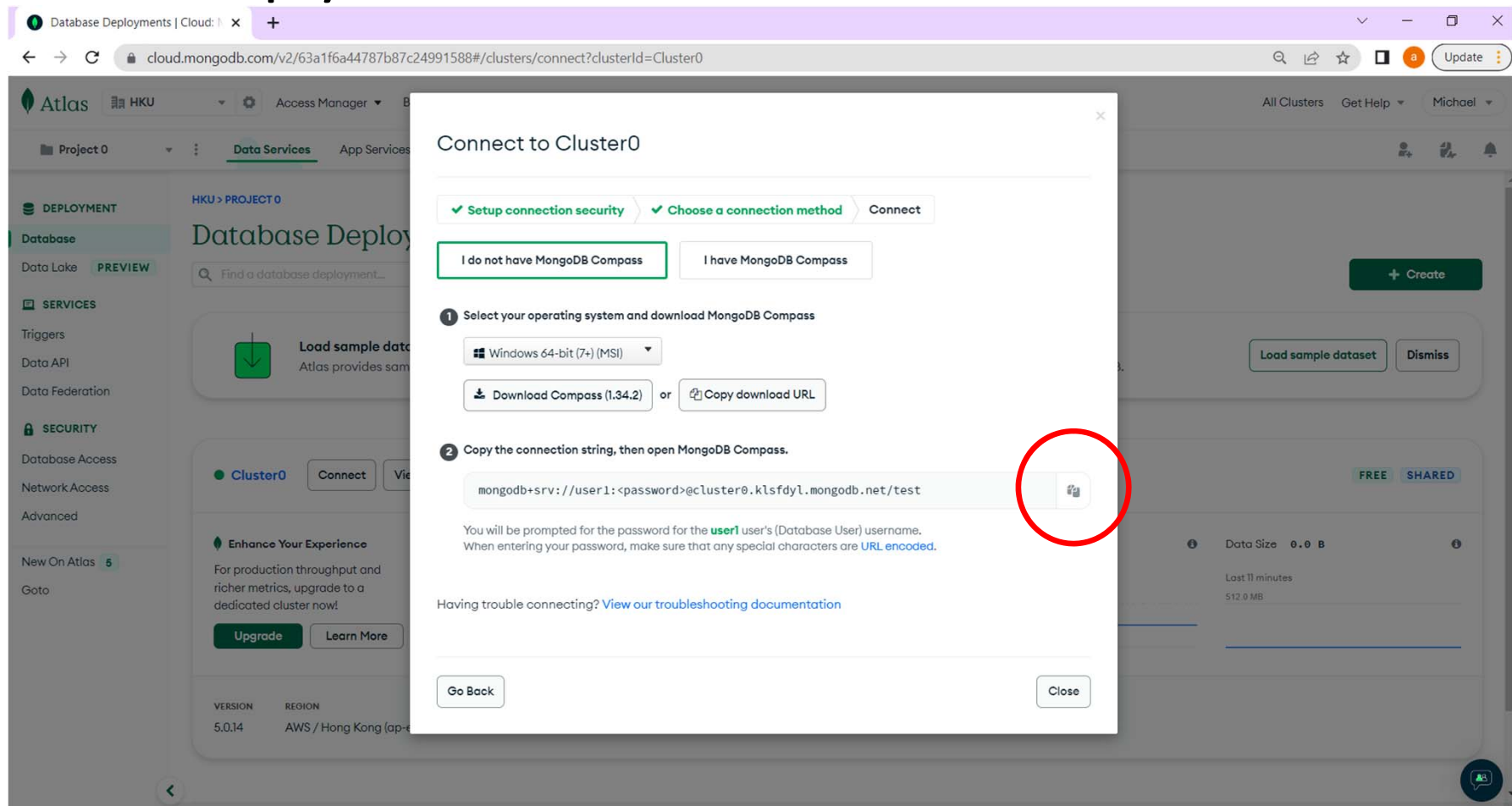


13. Start MongoDB Compass



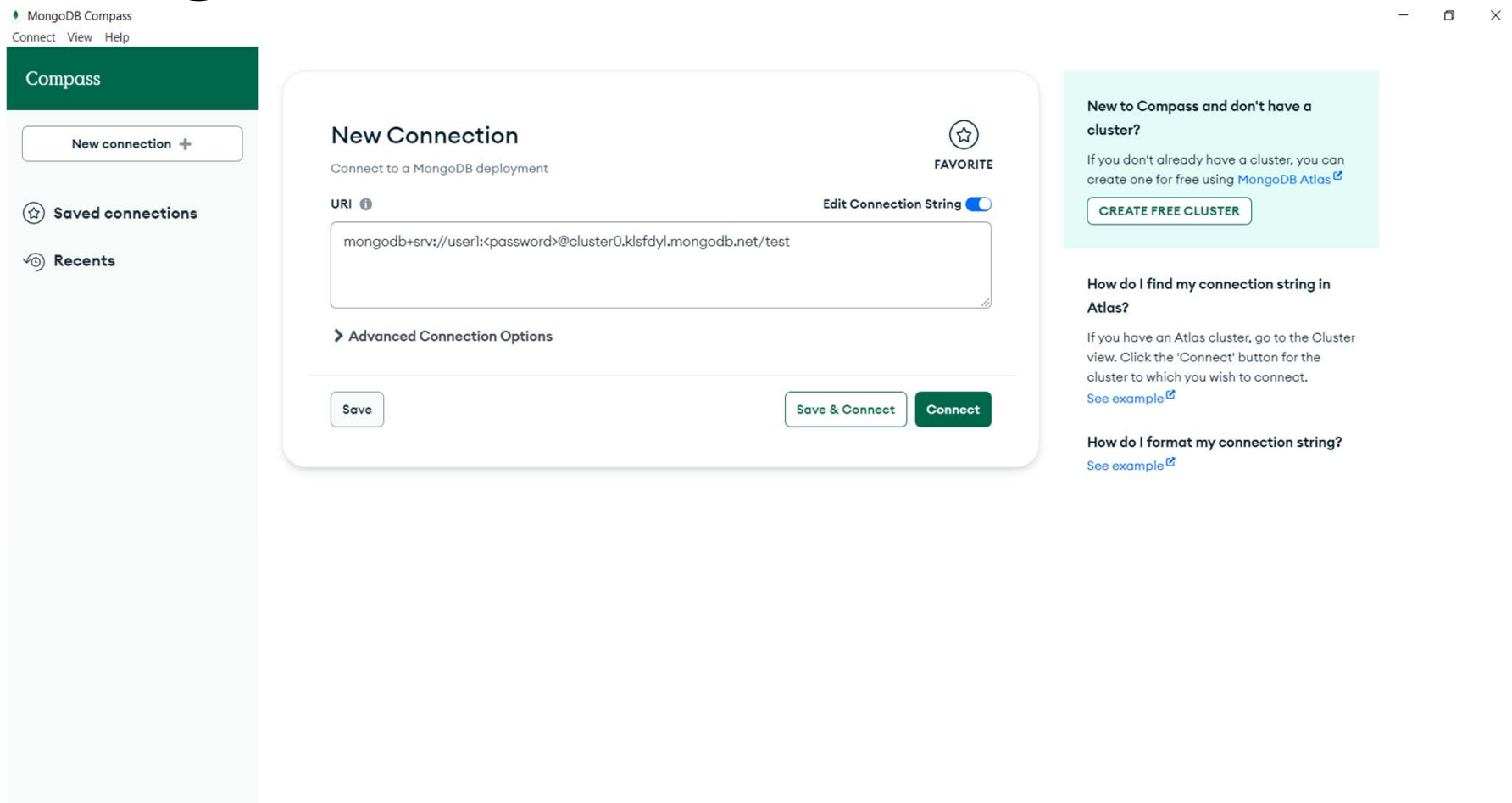
14. Go back to the web browser

Copy the connection string by clicking the copy button



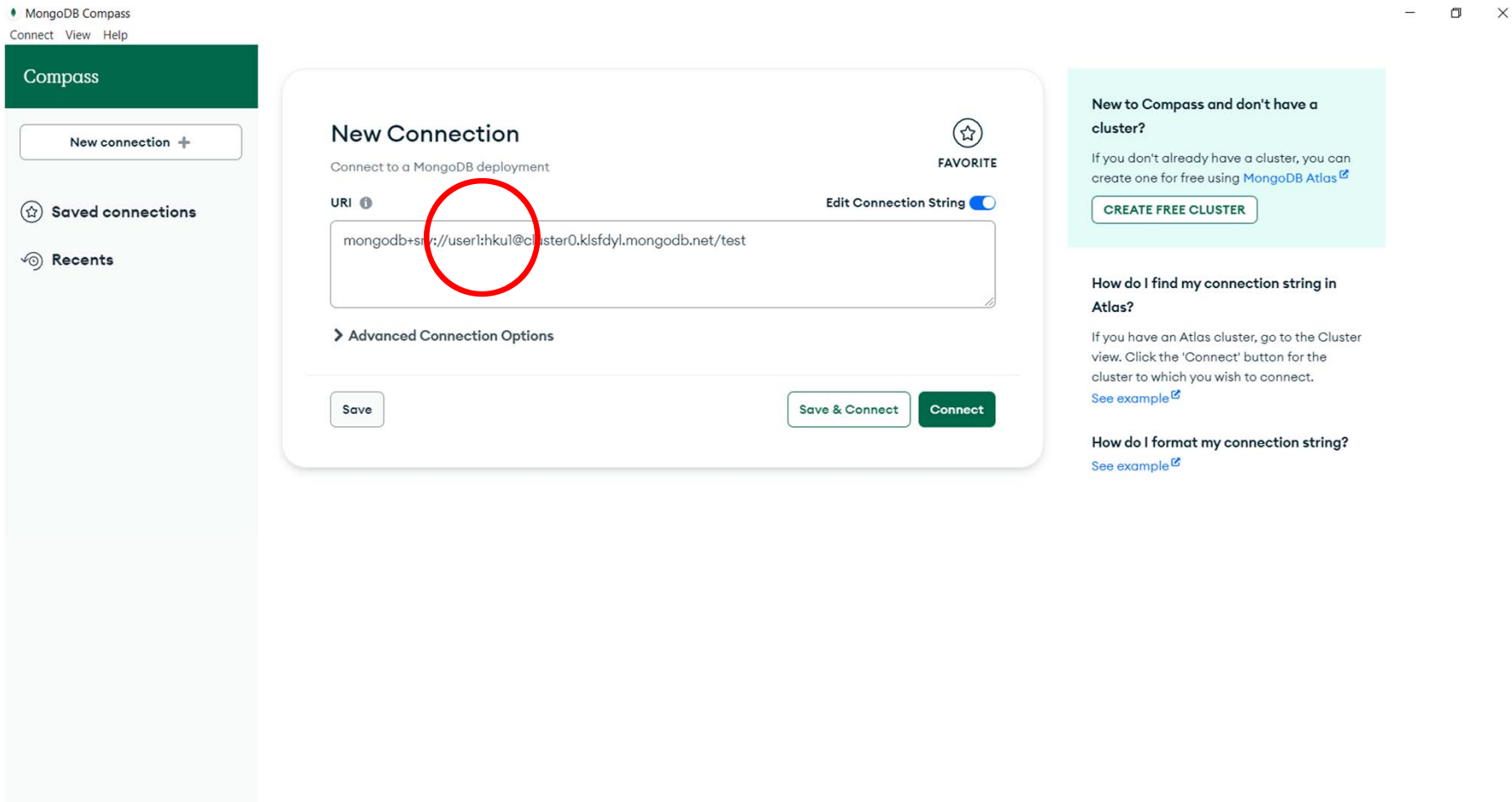
15. Go back to MongoDB Compass

Paste the just copied connection string to URI



Change “<password>” to “hku”

Then click “Connect”



The screenshot shows the MongoDB Compass interface. On the left is a sidebar with 'MongoDB Compass' at the top, followed by 'Connect View Help' and a 'Compass' header. Below this are buttons for 'New connection +', 'Saved connections', and 'Recents'. The main area is titled 'New Connection' with a subtitle 'Connect to a MongoDB deployment'. It features a 'URI' field with a red circle around the password 'hku1' in the connection string 'mongodb+srv://user1:hku1@cluster0.klsfdyl.mongodb.net/test'. To the right of the URI field is a toggle for 'Edit Connection String'. Below the URI field is a link for 'Advanced Connection Options'. At the bottom are three buttons: 'Save', 'Save & Connect', and 'Connect'. On the right side of the dialog, there is a 'FAVORITE' button with a star icon. To the right of the main dialog is a light blue sidebar with two sections: 'New to Compass and don't have a cluster?' with a 'CREATE FREE CLUSTER' button, and 'How do I find my connection string in Atlas?' with a 'See example' link. Below that is another section 'How do I format my connection string?' with a 'See example' link.

MongoDB Compass
Connect View Help

Compass

New connection +

Saved connections

Recents

New Connection
Connect to a MongoDB deployment

URI ⓘ

mongodb+srv://user1:hku1@cluster0.klsfdyl.mongodb.net/test

Edit Connection String

Advanced Connection Options

Save Save & Connect Connect

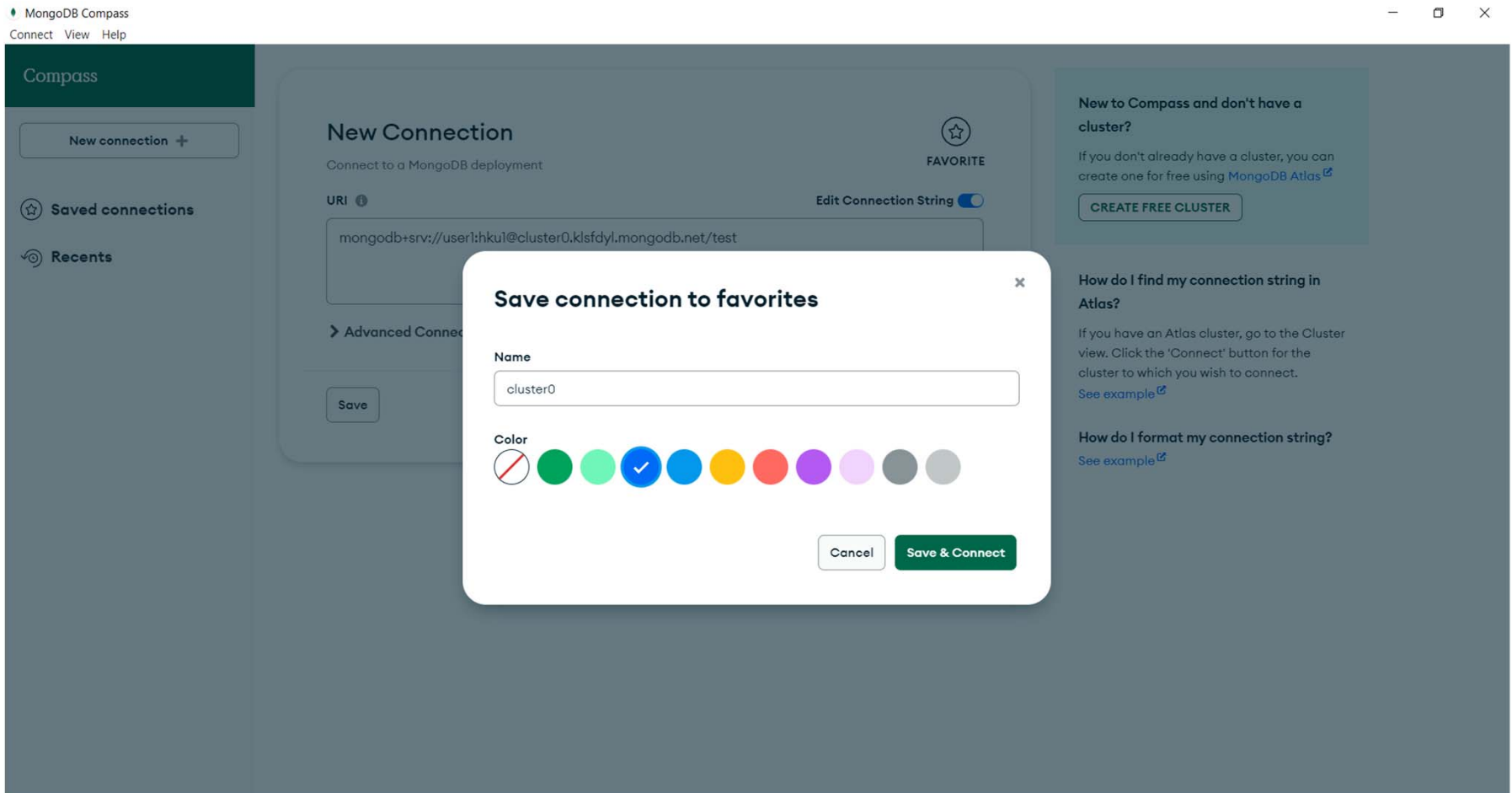
FAVORITE

New to Compass and don't have a cluster?
If you don't already have a cluster, you can create one for free using [MongoDB Atlas](#)
[CREATE FREE CLUSTER](#)

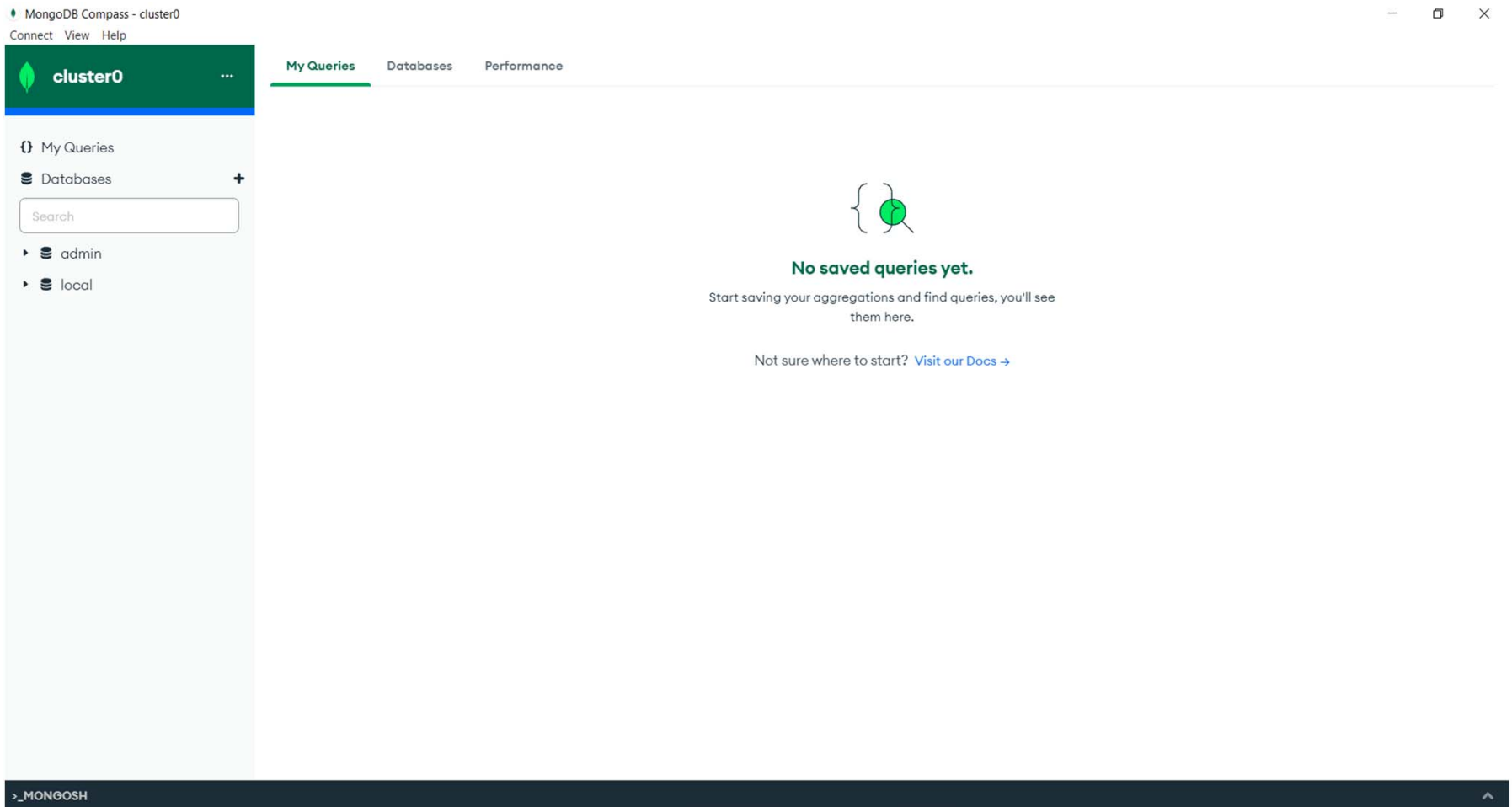
How do I find my connection string in Atlas?
If you have an Atlas cluster, go to the Cluster view. Click the 'Connect' button for the cluster to which you wish to connect.
[See example](#)

How do I format my connection string?
[See example](#)

Click “Save & Connect”



Successfully connected!



You can reuse the connection to “cluster0” when you open MongoDB Compass next time

The screenshot displays the MongoDB Compass application window. On the left sidebar, under the 'Compass' header, there is a 'New connection +' button. Below it, the 'Saved connections' section is visible, containing a single entry named 'cluster0' with a timestamp of '21 Dec 2022, 02:41'. This entry is circled in red. Below 'Saved connections' is the 'Recents' section. The main panel is titled 'New Connection' and includes a subtitle 'Connect to a MongoDB deployment'. It features a 'URI' field with the value 'mongodb://localhost:27017' and an 'Edit Connection String' toggle. At the bottom of the main panel are three buttons: 'Save', 'Save & Connect', and 'Connect'. On the right side of the interface, there are two informational panels. The top one, titled 'New to Compass and don't have a cluster?', suggests creating a free cluster using MongoDB Atlas. The bottom one, titled 'How do I find my connection string in Atlas?', provides instructions on where to find the connection string in the Atlas interface.

MongoDB Compass
Connect View Help

Compass

New connection +

Saved connections

cluster0
21 Dec 2022, 02:41

Recents

New Connection
Connect to a MongoDB deployment

URI ⓘ Edit Connection String ☒

mongodb://localhost:27017

Advanced Connection Options

Save Save & Connect Connect

New to Compass and don't have a cluster?
If you don't already have a cluster, you can create one for free using [MongoDB Atlas](#)
[CREATE FREE CLUSTER](#)

How do I find my connection string in Atlas?
If you have an Atlas cluster, go to the Cluster view. Click the 'Connect' button for the cluster to which you wish to connect.
[See example](#)

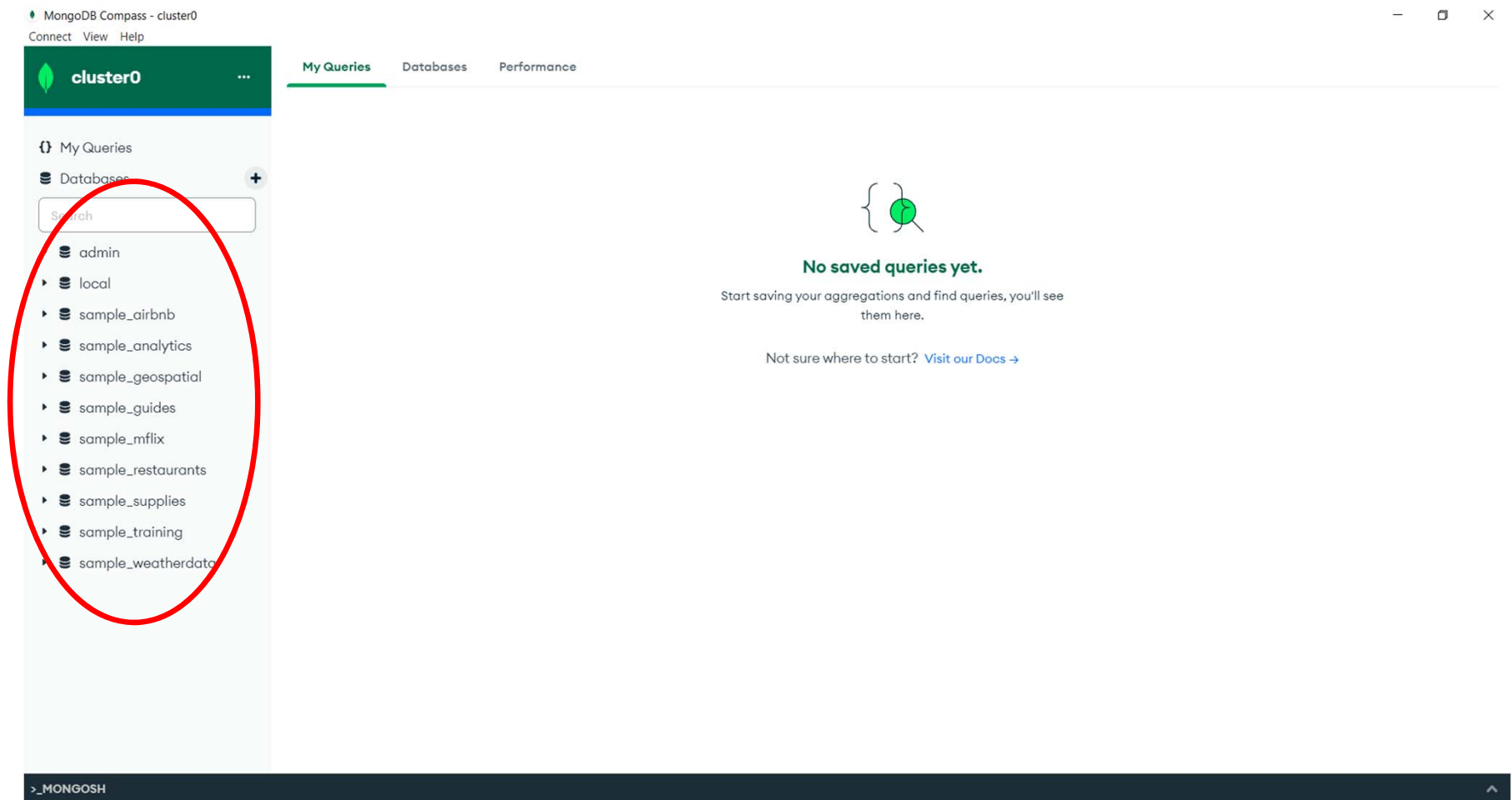
How do I format my connection string?
[See example](#)

You may also load some sample data to your database (this button may not be available)

The screenshot shows the MongoDB Atlas interface for 'Project 0'. The 'Database Deployments' section is active, displaying a search bar and a '+ Create' button. A red circle highlights the 'Load sample datasets to Cluster0.' button, which includes a green download icon. Below this, there are buttons for 'Load sample dataset' and 'Dismiss'. The 'Cluster0' section shows various metrics: 'Enhance Your Experience' with an 'Upgrade' button, 'R 0' and 'W 0' read/write operations, 'Connections 0', 'In 0.0 B/s' and 'Out 0.0 B/s' network throughput, and 'Data Size 0.0 B'. A table at the bottom provides details about the cluster:

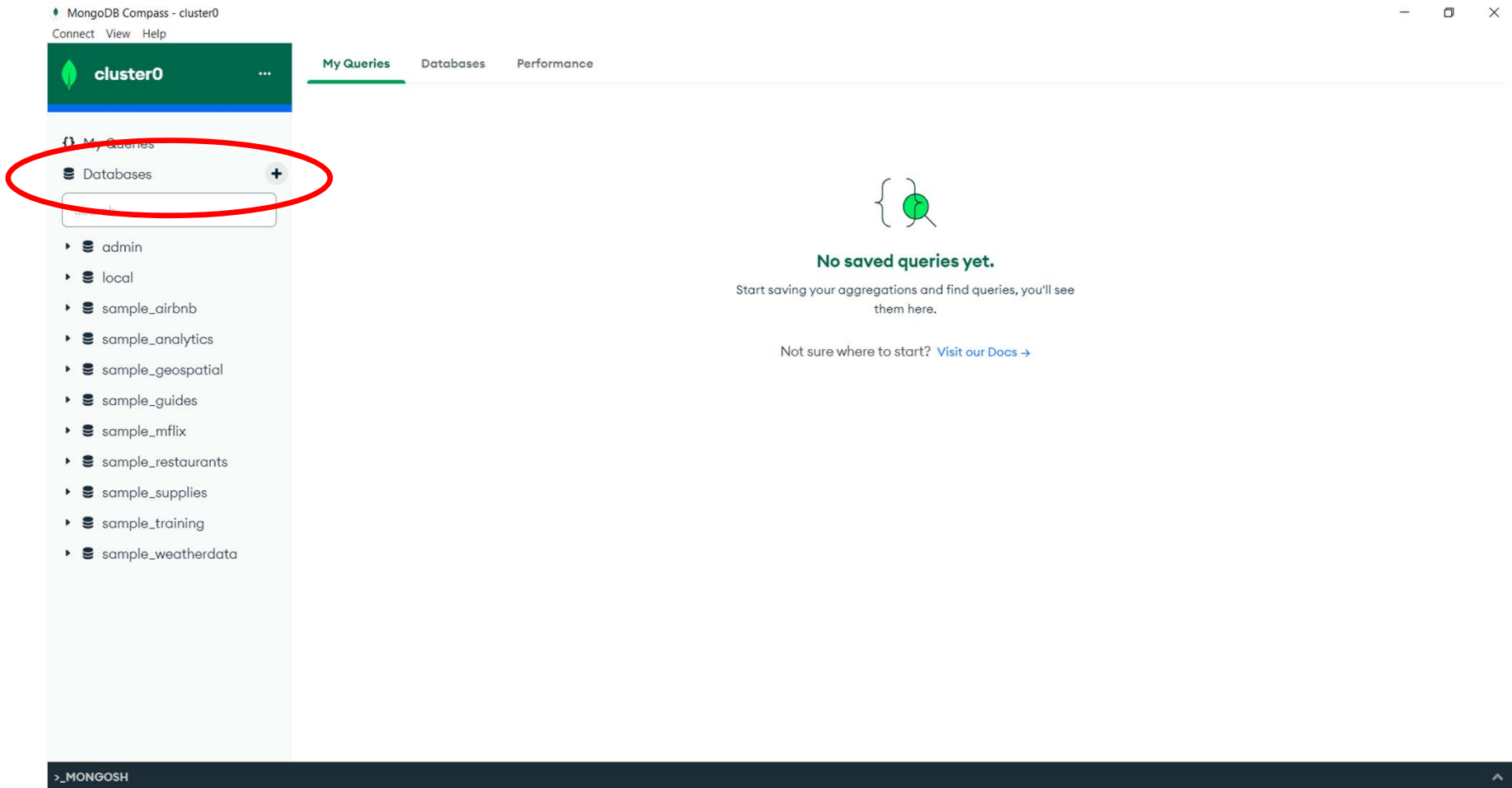
VERSION	REGION	CLUSTER TIER	TYPE	BACKUPS	LINKED APP SERVICES	ATLAS SEARCH
5.0.14	AWS / Hong Kong (ap-east-1)	M0 Sandbox (General)	Replica Set - 3 nodes	Inactive	None Linked	Create Index

List of sample data will then be visible in MongoDB (may take some time to load)

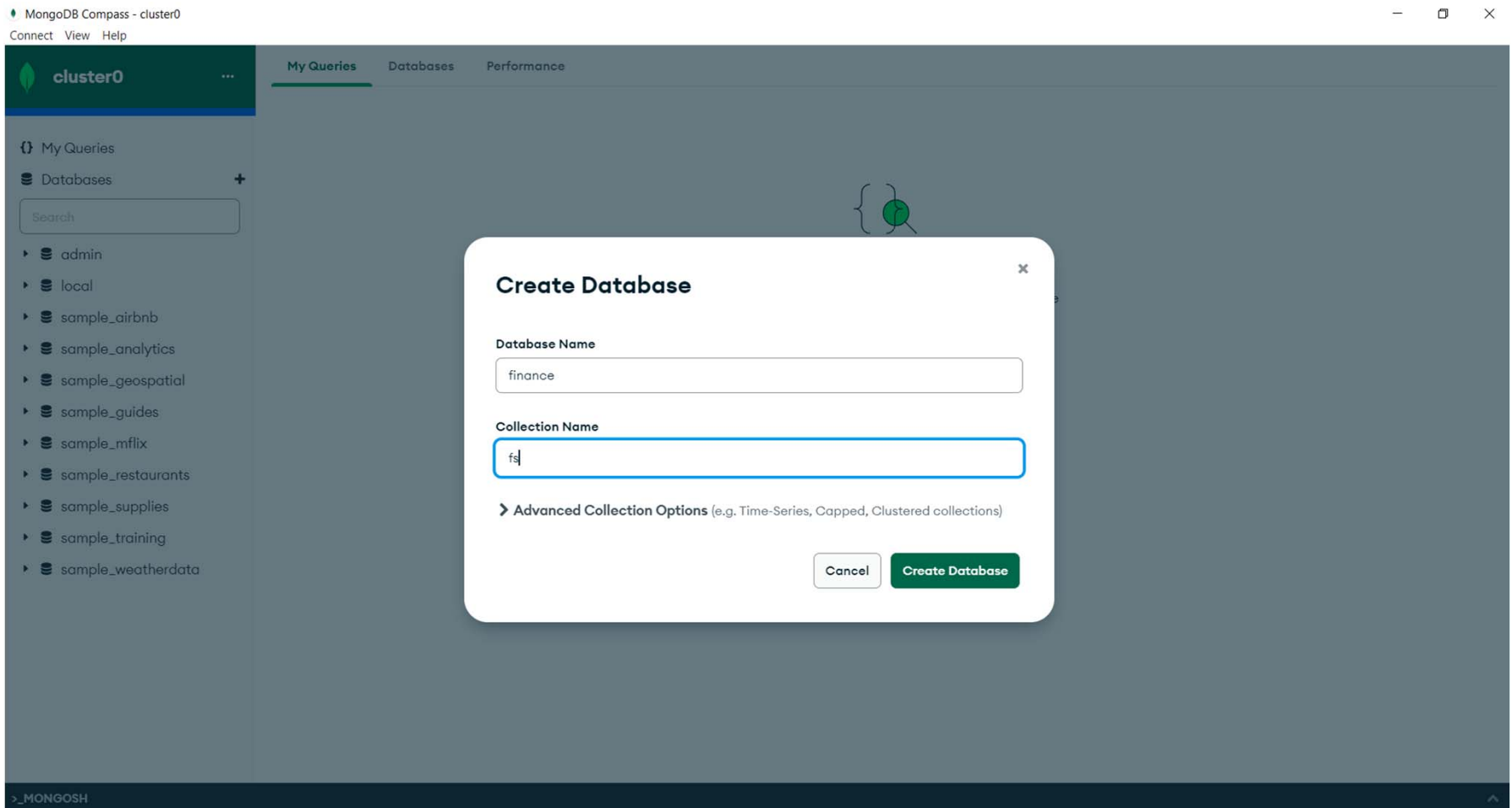


Creating Databases and Tables Through MongoDB Compass

Click the “+” sign next to “Databases” on the left panel



Put “finance” as Database Name “fs” as Collection Name



Import FS into MongoDB

The screenshot shows the MongoDB Compass interface. The title bar indicates the connection is to 'cluster0/finance'. The left sidebar shows the 'cluster0' database selected, with a list of databases including 'admin', 'finance', 'local', and several 'sample_' databases. The 'finance' database is expanded, showing a folder icon for 'fs'. The main panel displays the 'Collections' view for the 'fs' collection. It includes a 'Create collection' button, a 'View' button, and a 'Sort by' dropdown set to 'Collection Name'. Below this, a summary card for the 'fs' collection shows the following statistics:

Storage size:	Documents:	Avg. document size:	Indexes:	Total index size:
4.10 kB	0	0 B	1	4.10 kB

At the bottom of the interface, a terminal window shows the command prompt '>_MONGOSH'.

Click “Import Data”

The screenshot shows the MongoDB Compass interface for a cluster named 'cluster0'. The left sidebar displays a list of databases and collections. The 'finance' database is expanded, showing a collection named 'fs'. The main panel displays the 'finance.fs' collection, which is currently empty (0 documents, 1 index). The 'Import Data' button is highlighted with a red circle. The interface includes a search bar, a query editor, and a terminal at the bottom.

MongoDB Compass - cluster0/finance.fs
Connect View Help

cluster0

Documents
finance.fs

finance.fs

Documents Aggregations Schema Explain Plan Indexes Validation

Filter Type a query: { field: 'value' }

Reset Find More Options

0 - 0 of 0

ADD DATA EXPORT COLLECTION

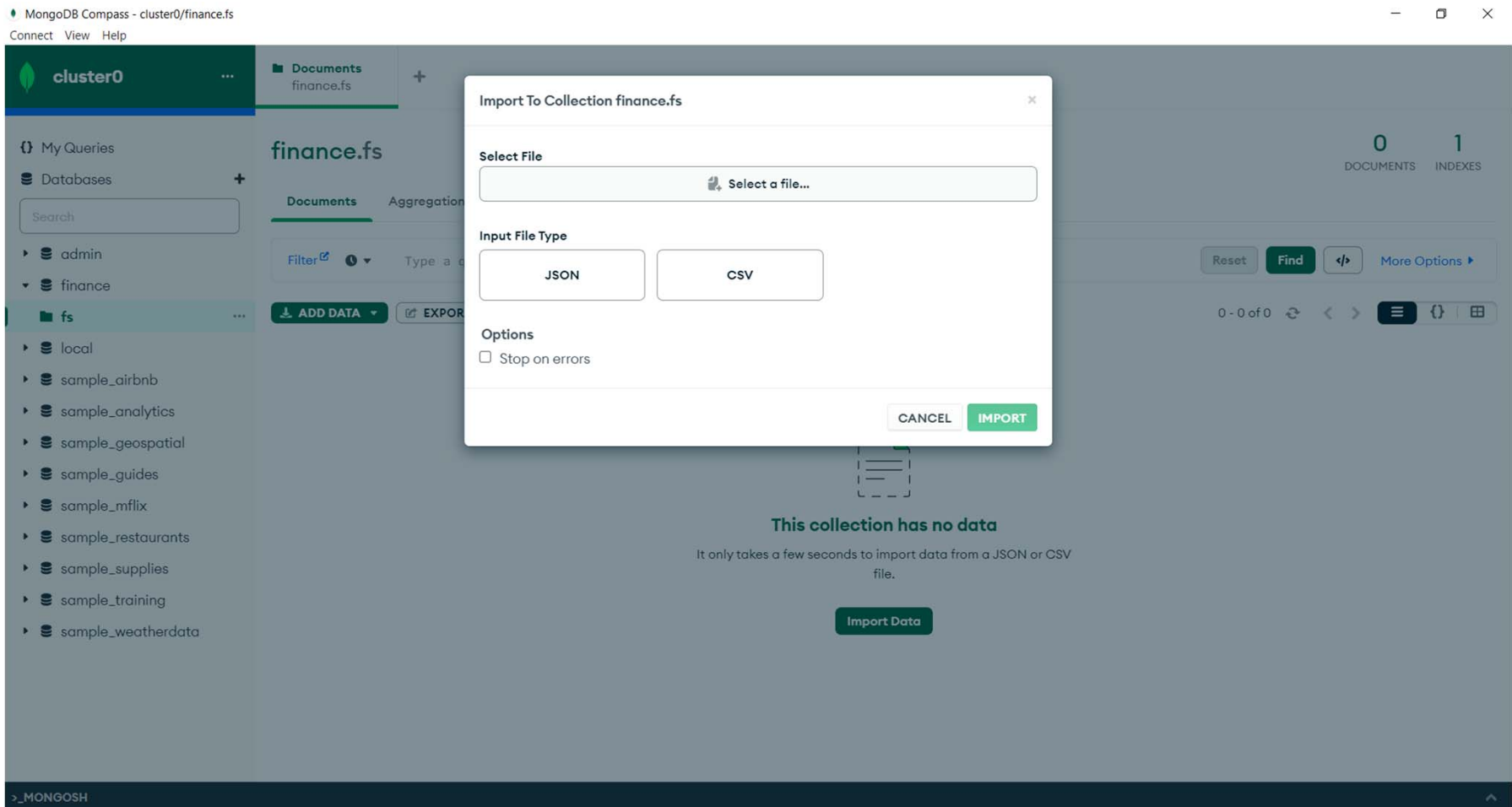
This collection has no data
It only takes a few seconds to import data from a JSON or CSV file.

Import Data

>_MONGOSH

Choose the FS file from your computer

Select “CSV”



Choose the correct data type for each field

Click Import

MongoDB Compass - cluster0/finance.fs

Connect View Collection Help

cluster0

Documents finance.fs

My Queries

Databases

Search

admin

finance

fs

local

sample_airbnb

sample_analytics

sample_geospatial

sample_guides

sample_mflix

sample_restaurants

sample_supplies

sample_training

sample_weatherdata

finance.fs

Documents Aggregation

Filter

Type a

ADD DATA

EXPORT

Import To Collection finance.fs

Select File

FS.csv

Input File Type

JSON CSV

Options

Select delimiter COMMA

☒ Ignore empty strings

☐ Stop on errors

Specify Fields and Types

	<input checked="" type="checkbox"/> ID	<input checked="" type="checkbox"/> Ticker	<input checked="" type="checkbox"/> Year	<input checked="" type="checkbox"/> Total Assets
	Number	String	Number	Number
1	1	AAPL	2010	75183000
2	6	AAPL	2011	116371000
3	11	AAPL	2012	176064000
4	2	AMZN	2010	18797000
5	7	AMZN	2011	25278000
6	12	AMZN	2012	32555000
7	3	IBM	2010	113450000
8	8	IBM	2011	116433000
9	13	IBM	2012	119213000
10	4	KO	2010	72921000

CANCEL IMPORT

cluster0

Documents
finance.fs

My Queries

Databases

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local

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sample_analytics

sample_geospatial

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sample_mflix

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sample_weatherdata

finance.fs

Documents

Aggregation

Filter

Type a

ADD DATA

EXPORT

_id: ObjectId('63...')

TY: 1

Ticker: "AAPL"

Year: 2010

Total_Assets: 751...

_id: ObjectId('63...')

TY: 6

Ticker: "AAPL"

Year: 2011

Total_Assets: 116...

_id: ObjectId('63...')

TY: 11

Ticker: "AAPL"

Year: 2012

Total_Assets: 176...

_id: ObjectId('63...')

TY: 2

Ticker: "AMZN"

Year: 2010

Total_Assets: 197...

Import To Collection finance.fs

Select File

FS.csv

Input File Type

JSON

CSV

Options

Select delimiter

COMMA

☒ Ignore empty strings

☐ Stop on errors

Specify Fields and Types

	<input checked="" type="checkbox"/> TY Number	<input checked="" type="checkbox"/> Ticker String	<input checked="" type="checkbox"/> Year Number	<input checked="" type="checkbox"/> Total_Assets Number
1	1	AAPL	2010	75183000
2	6	AAPL	2011	116371000
3	11	AAPL	2012	176064000
4	2	AMZN	2010	18797000
5	7	AMZN	2011	25278000
6	12	AMZN	2012	32555000
7	3	IBM	2010	113450000
8	8	IBM	2011	116433000
9	13	IBM	2012	119213000
10	4	KO	2010	72921000

Import completed

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DOCUMENTS

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Reset

Find

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More Options

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MongoDB Compass - cluster0/finance.fs

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finance.fs

Documents Aggregations Schema Explain Plan Indexes Validation

Filter Type a query: { field: 'value' }

Reset Find

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ADD DATA EXPORT COLLECTION

15 DOCUMENTS 1 INDEXES

_id: ObjectId('63a20330c47ba5a6b680b07a')
TY: 1
Ticker: "AAPL"
Year: 2010
Total_Assets: 75183000

_id: ObjectId('63a20330c47ba5a6b680b07b')
TY: 6
Ticker: "AAPL"
Year: 2011
Total_Assets: 116371000

_id: ObjectId('63a20330c47ba5a6b680b07c')
TY: 11
Ticker: "AAPL"
Year: 2012
Total_Assets: 176064000

_id: ObjectId('63a20330c47ba5a6b680b07d')
TY: 2
Ticker: "AMZN"
Year: 2010
Total_Assets: 15707000

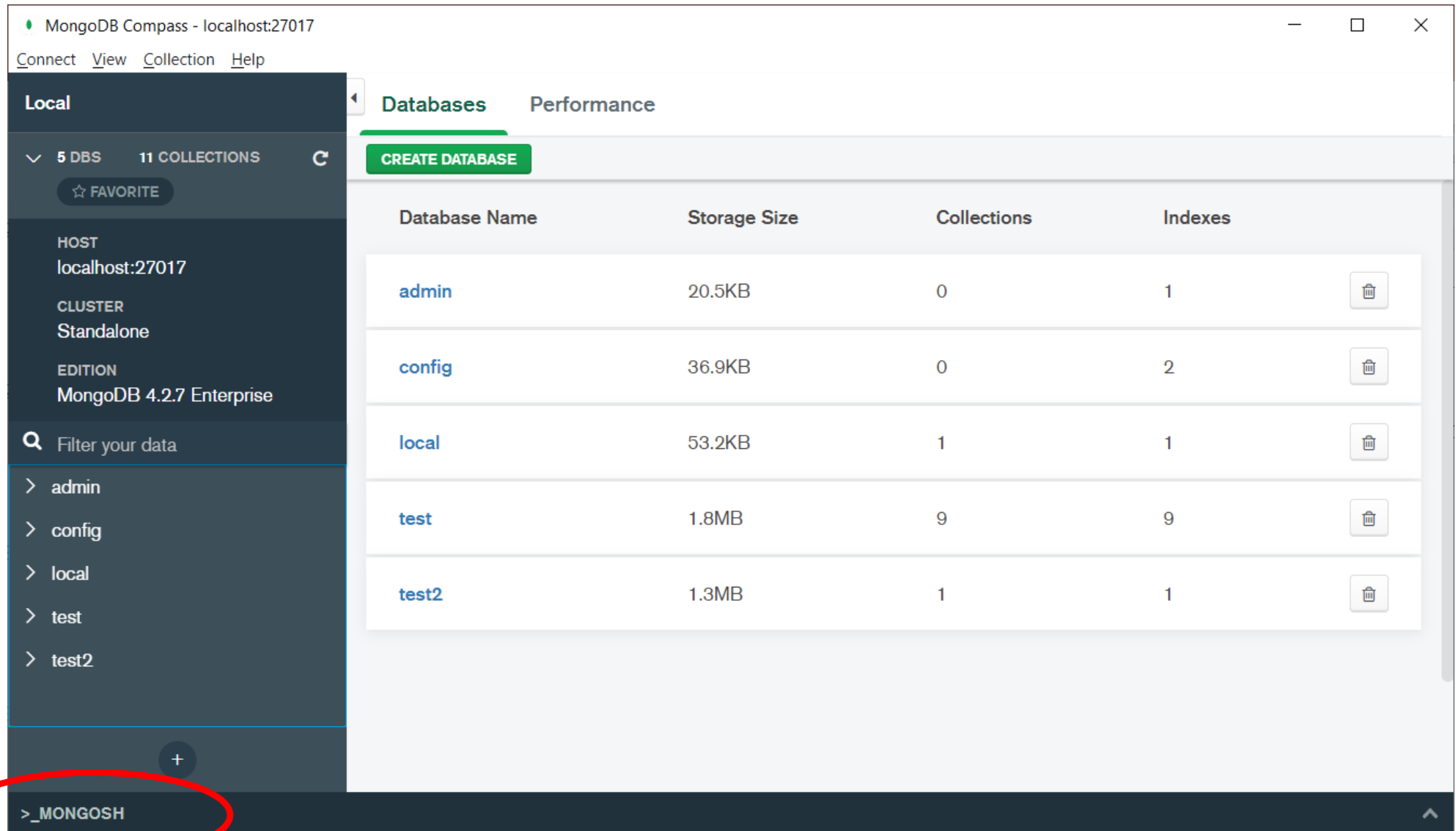
>_MONGOSH

Exercise

- Import DP and Articles into MongoDB and check the results

Writing MongoDB Queries

Click Mongosh at the lower left of Mongo Compass to run MongoDB queries



Show Databases and Tables/Collections

	MongoDB	MySQL
Show database	<code>show dbs/databases</code>	<code>SHOW DATABASES;</code>
Use database	<code>use database_name</code>	<code>USE database_name</code>
Show tables/collections	<code>show collections/tables</code>	<code>SHOW TABLES;</code>
Show all values in a table	<code>db.collectionName.find()</code>	<code>SELECT * FROM tableName</code>

Create/Drop Table/Collection

- Create Table/Collection:

- MySQL:

```
CREATE TABLE TableName (column1, datatype1, ...)
```

- MongoDB:

```
db.createCollection("CollectionName")
```

- Drop Table/Collection:

- MySQL:

```
DROP TABLE TableName
```

- MongoDB:

```
db.collectionName.drop()
```

Create/Drop Table/Collection

- Exercise 1. Create a collection in MongoDB with the name of “t4” and show collections.

```
db.createCollection("t4")  
show collections
```

- Exercise 2. Drop the collection “t4” in MongoDB and show collections.

```
db.t4.drop()  
show collections
```

Add/Drop Column/Field

- MySQL Add Column:

```
ALTER TABLE TableName ADD new_column_name new_datatype
```

- MySQL Drop Column:

```
ALTER TABLE TableName DROP column_name
```

- MongoDB Add Field:

```
db.collectionName.updateMany({}, {$set:{new_field:""}})
```

- MongoDB Drop Field:

```
db.collectionName.updateMany({}, {$unset:{"new_field": ""}})
```

Insert Values

- MySQL insert values:

```
INSERT INTO TableName (Column1, Column2,  
Column3)  
VALUES (Value1, Value2, Value3)
```

- MongoDB insert values:

```
db.collectionName.insertOne({ Field1: Value1,  
Field2: Value2, Field3: Value3})
```

Exercise

- Create collection `olympics` in MongoDB with the following data.

Year	Location
2016	Rio de Janeiro
2020	Tokyo

```
db.olympics.insertOne({Year: 2016, Location: 'Rio de Janeiro'})  
db.olympics.insertOne({Year: 2020, Location: 'Tokyo'})
```

OR

```
db.olympics.insertMany([{Year: 2016, Location: 'Rio de Janeiro'},  
{Year: 2020, Location: 'Tokyo'}])
```

Select Statements

- MySQL:

```
SELECT Column1, Column2 FROM TableName
```

- MongoDB:

```
db.collectionName.find({ }, { Field1: 1, Field2: 1})
```

- Exercise: select fields Ticker and Year in the collection “fs”

```
db.fs.find({ }, { Ticker: 1, Year: 1 })
```

- Hide id:

```
db.fs.find({ }, { Ticker: 1, Year: 1, _id:0 })
```

Select Statements – Limit Row

- MySQL:

```
SELECT * FROM TableName LIMIT 10
```

- MongoDB:

```
db.collectionName.find().limit(10)
```

- Exercise: Show the first 5 records in collection “fs”

```
db.fs.find().limit(5)
```

Select Statements - WHERE

- MySQL:

```
SELECT Column1, Column2 FROM TableName  
WHERE Column1 = Value1
```

- MongoDB:

```
db.collectionName.find({Field1: Value1}, {Field1:  
1, Field2: 1})
```

- Exercise: Select field Ticker and Year of AAPL in the collection “fs”

```
db.fs.find({ Ticker: "AAPL" }, { Ticker: 1,  
Year: 1})
```


Select Statements - Comparison

- MySQL:
`SELECT * FROM TableName WHERE Column1 > Value1`
- MongoDB:
`db.collectionName.find({ Field1: { $gt: Value1 } })`
 - `$gt: >` `$lt: <`
 - `$gte: >=` `$lte: <=`
- Exercise: Select Ticker, Year, and Total Assets of all records before 2012 (2012 is not included) in the collection "fs".

```
db.fs.find({Year:{$lt: 2012}}, {Ticker: 1,  
Year: 1, Total_Assets: 1})
```

If it does not work, it may be related to data type (String vs Number). Try:

```
db.fs.update( {},  
[ { $set: { Year: { $toDouble: "$Year" } } } ],  
{ multi: true })
```

Select Statements – And/Or

- MySQL:

```
SELECT * FROM TableName WHERE Column1 >= Value1  
AND Column1 < Value2
```

- MongoDB:

```
db.collectionName.find({ Field1: { $gte: Value1,  
$lt: Value2 } })
```

- MySQL:

```
SELECT * FROM TableName WHERE Column1=Value1 OR  
Column2=Value2
```

- MongoDB:

```
db.collectionName.find({ $or: [{ Field1:  
Value1 } , { Field2: Value2 }] })
```

Select Statements – And/Or

- Exercise: Translate the SQL to MongoDB query and hide id
- `SELECT Ticker, Year, Total_Assets`
`FROM fs`
`WHERE Year>2011 OR Total_Assets<=80000000`

```
db.fs.find({ $or:[ {Year: { $gt: 2011 } },  
{ Total_Assets : { $lte: 80000000} } ] },  
{ Ticker:1, Year:1, Total_Assets:1, _id:0})
```

Select Statements – Like

- MySQL:

```
SELECT * FROM TableName WHERE Column1 LIKE "%Value%"
```

- MongoDB:

```
db.collectionName.find( { Field1: /Value/ } )
```

- MySQL:

```
SELECT * FROM TableName WHERE Column1 LIKE "Value%"
```

- MongoDB:

```
db.collectionName.find( { Field1: /^Value/ } )
```

Select Statements – Like

- Exercise: Translate the SQL to MongoDB query and hide id

```
SELECT Ticker, Year, Total_Assets
FROM fs
WHERE Year>2011 OR Total_Assets<=80000000
AND Ticker LIKE "AA%"
```

```
db.fs.find({ $or:[ {Year: { $gt: 2011 } } ,
{ Total_Assets : { $lte: 80000000}} ] ,
Ticker: /^AA/ },
{ Ticker:1, Year:1, Total_Assets:1, _id:0})
```

Select Statements – Count Record Number

- MySQL:

```
SELECT COUNT(*) FROM TableName  
SELECT COUNT(*) FROM TableName WHERE  
Field1=Value1
```

- MongoDB:

```
db.collectionName.countDocuments({})  
db.collectionName.countDocuments({Field1: Value1})
```

- Exercise: Count the number of records in collection “fs”

```
db.fs.countDocuments()
```

Using MongoDB with Python (for reference only)

Import Data Into MongoDB Using Python

- In Anaconda Prompt: `pip install pymongo`

or

In Jupyter Notebook: `conda install pymongo`

-

```
import pandas as pd
from pymongo import MongoClient
connection_str = "mongodb..."
client = MongoClient(connection_str)
df=pd.read_csv(r'D:\MSBA7024\fs.csv')
data = df.to_dict(orient='records')
collection = client['finance']['fs1']
collection.insert_many(data)
```


Extract Data From MongoDB Using Python

Extract all records from the fs1 collection:

```
import pandas as pd
from pymongo import MongoClient
connection_str = "mongodb..."
client = MongoClient(connection_str)
db = client.finance
collection = db.fs1
data = pd.DataFrame(list(collection.find()))
print(data.head())
```

Extract Data From MongoDB Using Python

Extract only records of AAPL:

```
import pandas as pd
from pymongo import MongoClient
connection_str = "mongodb..."
client = MongoClient(connection_str)
db = client.finance
collection = db.fs1
data = pd.DataFrame(list(collection.find({"Ticker": "AAPL"})))
print(data.head())
```

Exercise

- Import DP and Articles into MongoDB through Python and check the results

Q&A