



## CS-340: Assignment 1-3: Module 1 Journal

Prepared on: September 6, 2025

Prepared for: Prof. Jeff H. Sanford

Prepared by: Alexander Ahmann

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## 1 Introduction

This writeup documents the tasks that I was able to perform for assignment 1-3 (CS-340, n.d.). The second section discusses the problem set, what I have done to perform tasks in accordance with the assignment guidelines, and demonstrations in the form of a screenshot, produced in an appendix, are depicted as evidence of my completion of the tasks.

To ensure that the screenshots are this student's original work, I have included my username (located in the top-right corner of the virtual lab),

and in some of the demonstrations, I put in comments along the lines of “Alexander Ahmann has logged into the system” or “Aleksey was here” as another piece of evidence to demonstrate originality.

## 1.1 List of figures and their relation to given tasks

- *Figure 1* depicts the results of myself simply logging into the *Codio* lab, in accordance with the directive: “Begin by logging into the Virtual Lab (Codio) and accessing the terminal application. Use the Mongo in Codio (Virtual Lab) Tutorial to help with this task.” (CS-340, n.d.)
- *Figure 2* depicts the results of myself interacting with the *MongoDB* instance through the `mongosh` shell, in accordance with the directive: “Execute the mongo command to start the mongo shell.” (CS-340, n.d.)
- *Figure 3* depicts the results of importing the `enron` dataset into the *MongoDB* instance, in accordance with the directive: “Load the database by executing the following at the Linux command line in the terminal you opened.” (CS-340, n.d.)
- *Figures 4, 5, and 6* depict the results of my initial assessment of `enron`’s `emails` collection, in accordance with the directive “Retrieve a document from the collection.” (CS-340, n.d.)
- *Figure 7* depicts the results of getting the “bson size” of an arbitrary document in the `emails` collection, in accordance with the directive: “Execute the command to find the size of a single document.” (CS-340, n.d.)
- *Figure 8* depicts the results of getting the “bson size” of all documents in the `emails` collection, in accordance with the directive “Execute the command to find the size of the collection of documents.” (CS-340, n.d.)

## 2 Problem Set

### 2.1 Q1: Logging into the Virtual Environment

The given task is as follows:

*“Begin by logging into the Virtual Lab (Codio) and accessing the terminal application. Use the Mongo in Codio (Virtual Lab) Tutorial to help with this task.”* — CS-340 (n.d.).

This task is fairly straightforward: the given tutorial<sup>1</sup> for logging into, and making use of, the virtual lab does a fine job explaining the procedure. Figure 1 depicts what was returned to me after logging into the *Codio* virtual environment.

## 2.2 Q2: Starting up MongoDB

The given task is as follows:

*“First, you must verify access to the environment by starting up the mongo shell. Open the terminal application; this is open by default when you first access Codio. If you do not have it already open, you can open it by clicking Tools > Terminal from the Codio menu bar, which will bring up a Linux shell prompt.”*

Like with the previous task, this one was pretty straightforward. Figure 2 depicts my results in starting up a *MongoDB* shell with the `mongodb` command.

## 2.3 Q3: Loading and Working with Datasets

This part is less straightforward, but nonetheless, I persisted. I started out by loading the `enron` database<sup>2</sup> to the `mongodb` instance with the following command:

```
mongoimport --db enron --collection
  emails --drop ./enron.json
```

I then logged into the MongoDB instance with the `mongosh` command, and proceeded to switch to the `enron` database context — this being depicted in figure 4. I then dumped a sample of an `enron` document with the command `db.emails.findOne()` — this being depicted in figures 5 and 6.<sup>3</sup>

---

<sup>1</sup>CS-340 (n.d.). *CS 340 Mongo in Codio (Virtual Lab) Tutorial*.

<sup>2</sup>In accordance with the following directive: “Load the database by executing the following at the Linux command line.” (CS-340, n.d.)

<sup>3</sup>Based on the following directive: “Execute the command to find the size of a single document” and the specific instructions to run the following commands in the `mongosh` shell:

```
show dbs
use enron
show collections
db.emails.findOne()
```

I then proceeded to gather basic statistics regarding the “bson size” of each of the documents in the `emails` collection.<sup>4</sup> I started small with a single document, and then advanced to list the “bson sizes” of all the documents in the `emails` collection:<sup>5</sup>

- Regarding the “bson size” of a single, arbitrary document in the collection, I used the `Object.bsonSize()` method,<sup>6</sup> like so:

```
Object.bsonsize(db.enron.findOne())
```

The results are depicted in figure 7.

- To get the “bson size” for all documents in the `emails` collection,<sup>7</sup> I used the `$bsonSize` operator like so:

```
db.emails.aggregate([
  {
    $project: {
      "rootSize": { $sum: { $bsonSize: "$$ROOT" } }
    }
  }
])
```

The results are depicted in figure 8.

## References

CS-340 (n.d.). *CS-340 Module One Assignment Guidelines and Rubric*.

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<sup>4</sup>But first, to make things work properly, I had to activate compatabiliy with legacy MongoDB versions by executing the following command in the shell: `snippet install mongocompat`.

<sup>5</sup>I referenced the following article when doing this task: “Ian” (Jun. 14, 2021). *2 Ways to Get a Document’s Size in MongoDB*. “Database.Guide”. Retrieved on Sept. 5, 2025 from: <https://database.guide/2-ways-to-get-a-documents-size-in-mongodb/>

<sup>6</sup>When I ran into problems with this command, I referenced the following resource to debug the issue: “user1949763” (Mar 4, 2014). *How to get the size of single document in MongoDB?*. StackOverflow. Retrieved on Sept. 5, 2025 from: <https://stackoverflow.com/questions/22008822/how-to-get-the-size-of-single-document-in-mongodb>

<sup>7</sup>In accordance with the directive: “Execute the command to find the size of the collection of documents.”

## A Appendix: Figures, Graphics and Charts

### A.1 Figure 1: Logging into the virtual environment

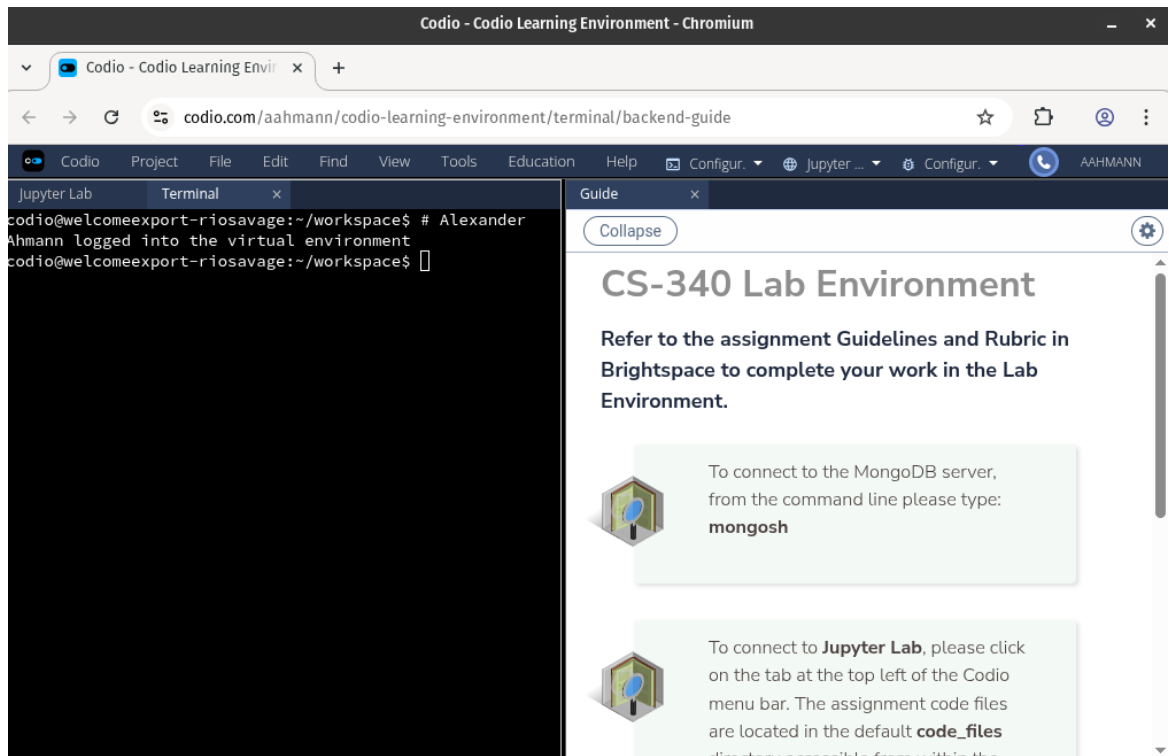


Figure 1: Logging into the virtual environment.

## A.2 Figure 2: Starting up the *MongoDB* shell

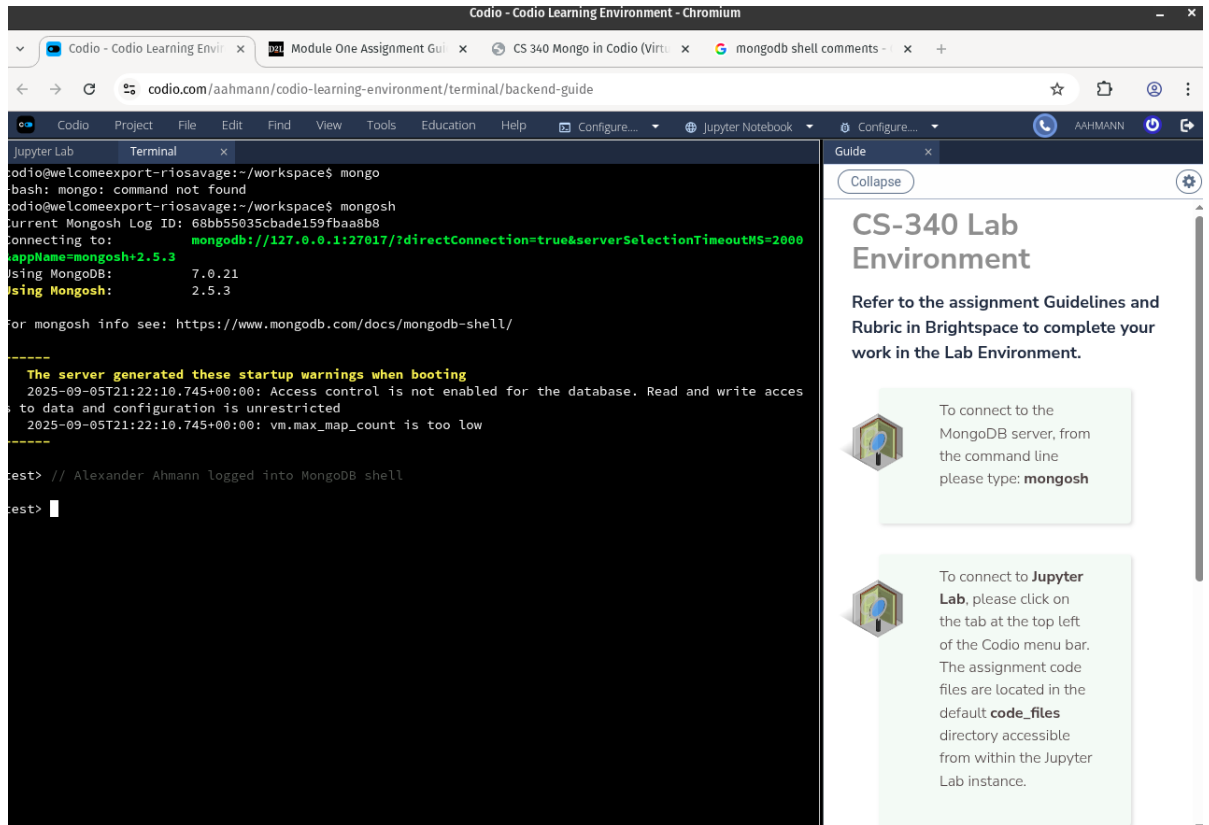
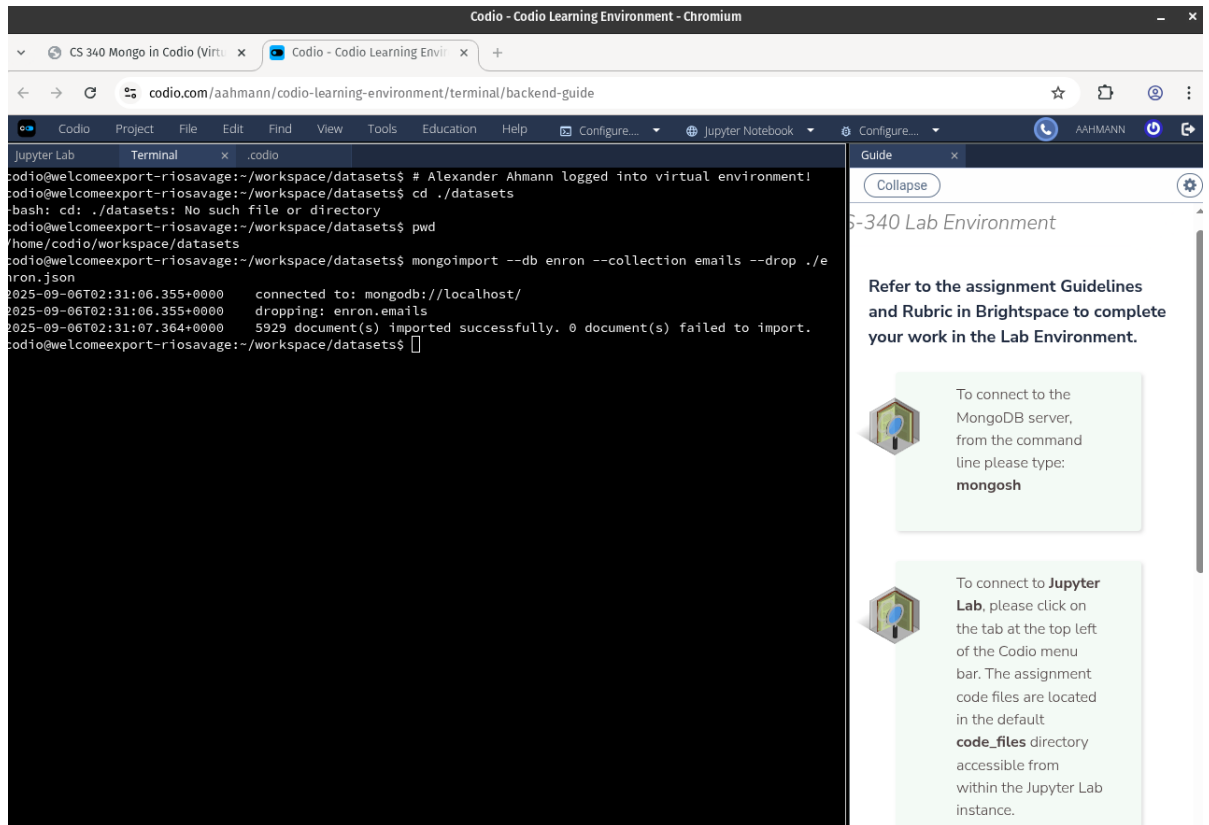


Figure 2: Starting up the *MongoDB* shell.

### A.3 Figure 3: Importing the enron dataset



The screenshot shows a web browser window with the address bar displaying `codio.com/aahmann/codio-learning-environment/terminal/backend-guide`. The browser tabs include "CS 340 Mongo in Codio (Virt..." and "Codio - Codio Learning Envir...". The browser window contains a Codio interface with a terminal window open. The terminal output shows the following commands and results:

```
codio@welcomeexport-riosavage:~/workspace/datasets$ # Alexander Ahmann logged into virtual environment!
codio@welcomeexport-riosavage:~/workspace/datasets$ cd ./datasets
-bash: cd: ./datasets: No such file or directory
codio@welcomeexport-riosavage:~/workspace/datasets$ pwd
/home/codio/workspace/datasets
codio@welcomeexport-riosavage:~/workspace/datasets$ mongoimport --db enron --collection emails --drop ./enron.json
2025-09-06T02:31:06.355+0000    connected to: mongodb://localhost/
2025-09-06T02:31:06.355+0000    dropping: enron.emails
2025-09-06T02:31:07.364+0000    5929 document(s) imported successfully. 0 document(s) failed to import.
codio@welcomeexport-riosavage:~/workspace/datasets$
```

On the right side of the terminal window, there is a "Guide" panel with a "Collapse" button. The guide contains the following text:

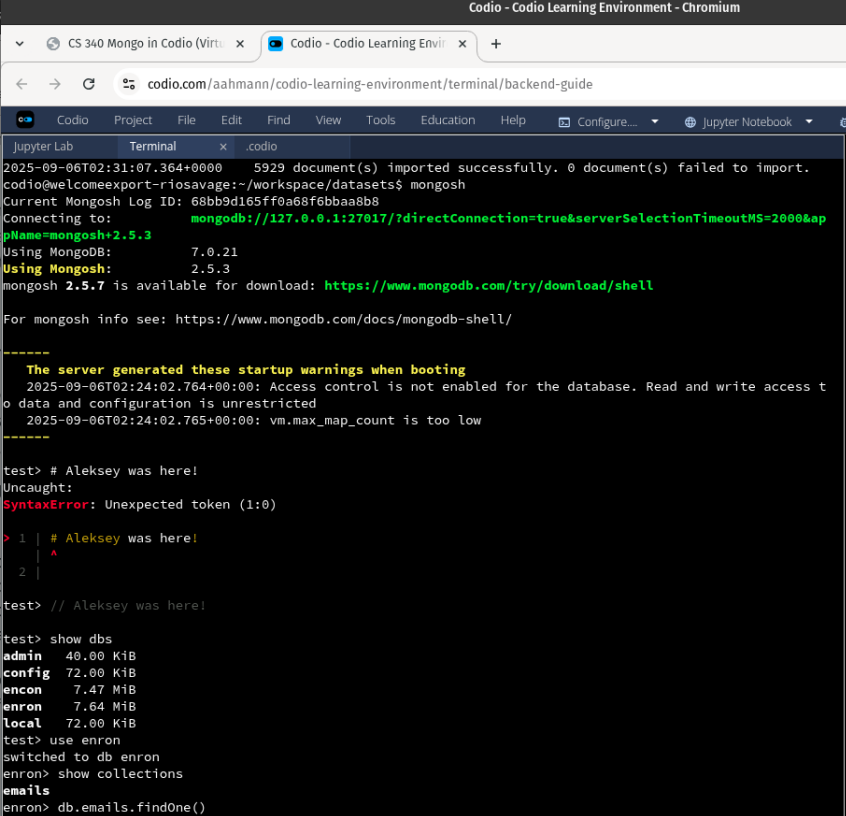
Refer to the assignment Guidelines and Rubric in Brightspace to complete your work in the Lab Environment.

To connect to the MongoDB server, from the command line please type: **mongosh**

To connect to Jupyter Lab, please click on the tab at the top left of the Codio menu bar. The assignment code files are located in the default **code\_files** directory accessible from within the Jupyter Lab instance.

Figure 3: Importing the enron dataset.

## A.4 Figures 4, 5, and 6— Regarding the Initial Assessment of enron the database



```
Codio - Codio Learning Environment - Chromium
CS 340 Mongo in Codio (Virtual Machine)
codio.com/aahmann/codio-learning-environment/terminal/backend-guide

Jupyter Lab Terminal .codio
2025-09-06T02:31:07.364+0000 5929 document(s) imported successfully. 0 document(s) failed to import.
codio@welcomeexport-riosavage:~/workspace/datasets$ mongosh
Current Mongosh Log ID: 68bb9d165ff0a68f6bbaa8b8
Connecting to: mongodb://127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+2.5.3
Using MongoDB: 7.0.21
Using Mongosh: 2.5.3
mongosh 2.5.7 is available for download: https://www.mongodb.com/try/download/shell
For mongosh info see: https://www.mongodb.com/docs/mongodb-shell/

-----
The server generated these startup warnings when booting
  2025-09-06T02:24:02.764+00:00: Access control is not enabled for the database. Read and write access to
data and configuration is unrestricted
  2025-09-06T02:24:02.765+00:00: vm.max_map_count is too low
-----

test> # Aleksey was here!
Uncaught:
SyntaxError: Unexpected token (1:0)
> 1 | # Aleksey was here!
    | ^
    |
    |
    |
2 |
test> // Aleksey was here!

test> show dbs
admin    40.00 KiB
config  72.00 KiB
encon    7.47 MiB
enron    7.64 MiB
local   72.00 KiB
test> use enron
switched to db enron
enron> show collections
emails
enron> db.emails.findOne()
```

CS-340 Lab Environment

Refer to the assignment Guidelines and Rubric in Brightspace to complete your work in the Lab Environment.

To connect to the MongoDB server, from the command line please type: **mongosh**

To connect to Jupyter Lab, please click on the tab at the top left of the Codio menu bar. The assignment code files are located in the default **code\_files** directory accessible from within the Jupyter Lab instance.

Figure 4: Logging into the shell and switching to the Enron database.



The screenshot shows a web browser window titled "Codio - Codio Learning Environment - Chromium". The address bar displays "codio.com/aahmann/codio-learning-environment/terminal/backend-guide". The interface includes a top menu bar with options like "Project", "File", "Edit", "Find", "View", "Tools", "Education", and "Help". Below this is a sub-menu bar with "Jupyter Lab", "Terminal", and ".codio".

The main terminal window displays the output of a MongoDB query: `enron> db.emails.findOne()`. The result is a JSON object representing an email:

```
{
  "_id": ObjectId('52af48b5d55148fa0c199645'),
  "sender": 'rosalee.fleming@enron.com',
  "recipients": [ 'rob.bradley@enron.com' ],
  "cc": [],
  "text": "Oh, Rob, I'm happy to do so!! I hope you are on vacation!!\n" +
    '\n' +
    'Rosie\n' +
    '\n' +
    '\n' +
    '\n' +
    '\n' +
    'Rob Bradley\n' +
    '08/04/2000 01:27 PM\n' +
    'To: Kenneth Lay/Corp/Enron@ENRON\n' +
    'cc: \n' +
    'Subject: Re: Gathering Place Speaking Invitation \n' +
    '\n' +
    'Great--and I will be inspired with my draft of his remarks.\n' +
    '\n' +
    'Rosie, could you call the phone number on the invitation, ask for Herb\n' +
    'Bateman (he is the director), and tell him of the commitment?\n' +
    '\n' +
    'I am out of town and do not have their number, and they called me wondering\n' +
    'about Ken's decision last Friday.\n' +
    '\n' +
    'Thanks,\n' +
    '\n' +
    '- Rob\n' +
    '\n' +
    '\n' +
    '\n' +
    '\n' +
    'Kenneth Lay on 08/04/2000 12:40:45 PM\n' +
    'Sent by: Rosalee Fleming\n' +
    'To: Rob Bradley/Corp/Enron@ENRON\n' +
    'cc: Tori L Wells/HOU/ECT@ECT\n' +
    '\n' +
  }
```

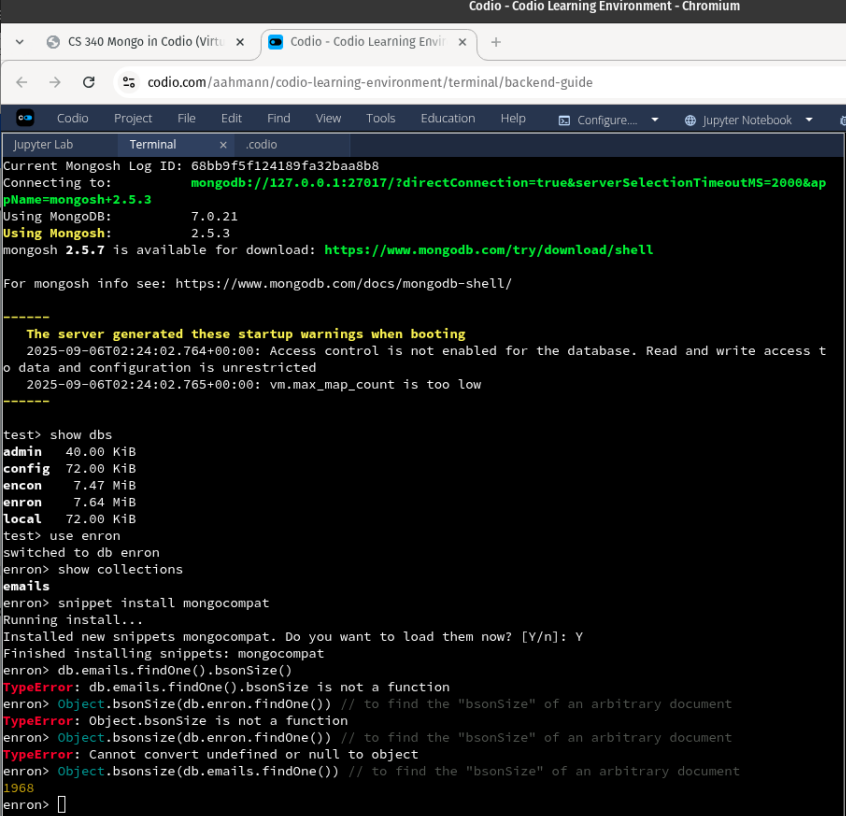
On the right side, there is a "Guide" sidebar with a "Collapse" button. It contains two sections:

- 6-340 Lab Environment**: Refer to the assignment Guidelines and Rubric in Brightspace to complete your work in the Lab Environment.
- To connect to the MongoDB server**: from the command line please type: **mongosh**
- To connect to Jupyter Lab**: please click on the tab at the top left of the Codio menu bar. The assignment code files are located in the default **code\_files** directory accessible from within the Jupyter Lab instance.

Figure 5: Sample of enron email.



## A.5 Figure 7: Application of `Object.bsonsize` to get the document size of an arbitrary item in the emails collection



The screenshot shows a web browser window with a terminal interface. The terminal displays the following commands and output:

```
Current Mongosh Log ID: 68bb9f5f124189fa32baa8b8
Connecting to: mongod://127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+2.5.3
Using MongoDB: 7.0.21
Using Mongosh: 2.5.3
mongosh 2.5.7 is available for download: https://www.mongodb.com/try/download/shell
For mongosh info see: https://www.mongodb.com/docs/mongodb-shell/

-----
The server generated these startup warnings when booting
2025-09-06T02:24:02.764+00:00: Access control is not enabled for the database. Read and write access to
data and configuration is unrestricted
2025-09-06T02:24:02.765+00:00: vm.max_map_count is too low
-----

test> show dbs
admin    40.00 KiB
config  72.00 KiB
enron    7.47 MiB
enron    7.64 MiB
local   72.00 KiB
test> use enron
switched to db enron
enron> show collections
emails
enron> snippet install mongocompat
Running install...
Installed new snippets mongocompat. Do you want to load them now? [Y/n]: Y
Finished installing snippets: mongocompat
enron> db.emails.findOne().bsonSize()
TypeError: db.emails.findOne().bsonSize is not a function
enron> Object.bsonSize(db.enron.findOne()) // to find the "bsonSize" of an arbitrary document
TypeError: Object.bsonSize is not a function
enron> Object.bsonsize(db.enron.findOne()) // to find the "bsonSize" of an arbitrary document
TypeError: Cannot convert undefined or null to object
enron> Object.bsonsize(db.emails.findOne()) // to find the "bsonSize" of an arbitrary document
1968
enron>
```

On the right side of the terminal, there is a 'Guide' panel with the following text:

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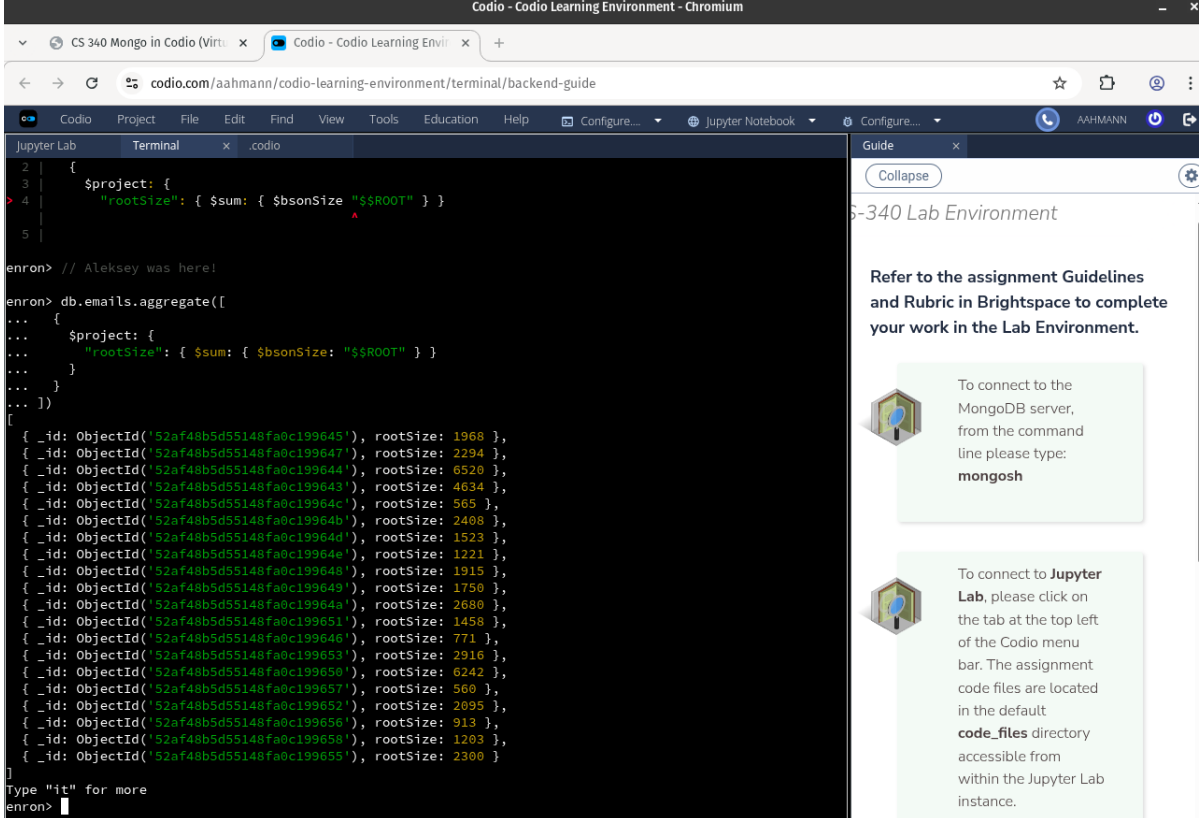
Refer to the assignment Guidelines and Rubric in Brightspace to complete your work in the Lab Environment.

To connect to the MongoDB server, from the command line please type: **mongosh**

To connect to Jupyter Lab, please click on the tab at the top left of the Codio menu bar. The assignment code files are located in the default **code\_files** directory accessible from within the Jupyter Lab instance.

Figure 7: Application of `Object.bsonsize` to get the document size of an arbitrary item in the emails collection.

## A.6 Figure 8: Application of \$bsonSize to get the document size of all items in the emails collection



The screenshot shows a web browser window with the address bar displaying 'codio.com/aahmann/codio-learning-environment/terminal/backend-guide'. The browser has multiple tabs, including 'CS 340 Mongo in Codio (Virtual Environment)' and 'Codio - Codio Learning Environment'. The main content area is a terminal window with a dark background. The terminal shows a MongoDB aggregation query being executed in a shell. The query uses the \$bsonSize operator to calculate the size of each document in the 'emails' collection. The output is a list of documents, each with an '\_id' field and a 'rootSize' field indicating the document size in bytes. The terminal also shows a prompt 'enron>' and a message 'Type "it" for more'.

```
2 {
3   $project: {
4     "rootSize": { $sum: { $bsonSize "$$ROOT" } }
5   }
6 }
7
enron> // Aleksey was here!
enron> db.emails.aggregate([
... {
...   $project: {
...     "rootSize": { $sum: { $bsonSize: "$$ROOT" } }
...   }
... }
... ])
[
  { _id: ObjectId('52af48b5d55148fa0c199645'), rootSize: 1968 },
  { _id: ObjectId('52af48b5d55148fa0c199647'), rootSize: 2294 },
  { _id: ObjectId('52af48b5d55148fa0c199644'), rootSize: 6520 },
  { _id: ObjectId('52af48b5d55148fa0c199643'), rootSize: 4634 },
  { _id: ObjectId('52af48b5d55148fa0c19964c'), rootSize: 565 },
  { _id: ObjectId('52af48b5d55148fa0c19964b'), rootSize: 2408 },
  { _id: ObjectId('52af48b5d55148fa0c19964d'), rootSize: 1523 },
  { _id: ObjectId('52af48b5d55148fa0c19964e'), rootSize: 1221 },
  { _id: ObjectId('52af48b5d55148fa0c199648'), rootSize: 1915 },
  { _id: ObjectId('52af48b5d55148fa0c199649'), rootSize: 1750 },
  { _id: ObjectId('52af48b5d55148fa0c19964a'), rootSize: 2680 },
  { _id: ObjectId('52af48b5d55148fa0c199651'), rootSize: 1458 },
  { _id: ObjectId('52af48b5d55148fa0c199646'), rootSize: 771 },
  { _id: ObjectId('52af48b5d55148fa0c199653'), rootSize: 2916 },
  { _id: ObjectId('52af48b5d55148fa0c199650'), rootSize: 6242 },
  { _id: ObjectId('52af48b5d55148fa0c199657'), rootSize: 560 },
  { _id: ObjectId('52af48b5d55148fa0c199652'), rootSize: 2095 },
  { _id: ObjectId('52af48b5d55148fa0c199656'), rootSize: 913 },
  { _id: ObjectId('52af48b5d55148fa0c199658'), rootSize: 1203 },
  { _id: ObjectId('52af48b5d55148fa0c199655'), rootSize: 2300 }
]
Type "it" for more
enron> 
```

Figure 8: Application of \$bsonSize to get the document size of all items in the emails collection.