Lab Homework 8: MongoDB and Redis

# Learning Objectives

In this exercise, you will practice programming in MongoDB and Redis:

* Query Data in MongoDB
* Create indexes in MongoDB
* Assign the appropriate Redis data structure to a given problem

# Setup

To complete this homework or follow along with the instructor’s class demos from your coursework, you must first complete the steps in this setup section. For this exercise we require both MongoDb and Redis Docker environments. For more details on the how’s and why’s of managing the database environments used in this course, consult Lab 1. Instructions for this assignment:

#### MongoDB

1. Open the PowerShell prompt on Windows or the Terminal on MacOS.
2. Type:  
   cd adv-db-labs  
   to change the working directory to the repository folder. If you are in the correct spot, your command prompt should have adv-db-labs in it, for instance: PS adv-db-labs>
3. Change into the mongodb folder, type:  
   cd mongodb  
   if you are in the correct folder, your command prompt should have mongodb in it.
4. Bring up the MongoDb environment, type:  
   docker-compose up -d
5. Check to make sure the environment is running, type:  
   docker-compose ps

You should see 2 Mongo services **Up**.

1. You are now ready to import the countries data into the **demo** database:   
   docker-compose exec mongo mongoimport -u admin -p pass --authenticationDatabase=admin -d demo -c countries --file=europe.json --jsonArray  
   When the import completed you will have added **53** documents to the **countries** collection.
2. Connect to the MongoDb client:   
   docker-compose exec mongo mongo -u admin -p pass --authenticationDatabase=admin

#### Redis

1. Open another PowerShell prompt on Windows or the Terminal on MacOS.
2. Type:  
   cd adv-db-labs  
   to change the working directory to the repository folder. If you are in the correct spot, your command prompt should have adv-db-labs in it, for instance: PS adv-db-labs>
3. Change into the redis folder, type:  
   cd redis  
   if you are in the correct folder, your command prompt should have redis in it.
4. Bring up the Redis environment, type:  
   docker-compose up -d
5. Check to make sure the environment is running, type:  
   docker-compose ps

You should see 1 Redis service **Up**.

1. Connect to the Redis client:  
   docker-compose exec redis redis-cli

# Exercises

Complete each of the following exercises. If you are unsure how to accomplish the task, please consult the coursework videos where there are explanations and demos.

1. Write a MongoDB Query to retrieve Country name, population, and capital for all countries in the collection.
2. Write a MongoDB Query to retrieve Country name, population, and capital for all countries with a population under 500,000 sorted by population.
3. Use the**. explain(“executionStats”)** method to analyze the query you wrote in the previous step. Write an index to improve the performance of the query, then perform another explain to demonstrate it worked. Include the code of the index you wrote, the and the relevant output of the execution stats which demonstrate the index is being used.
4. Select the most appropriate Redis data structure to store the following information:

|  |  |  |  |
| --- | --- | --- | --- |
| Product ID | Name | Qty On Hand | Unit Price |
| 1 | Apple | 7 | 2.49 |
| 2 | Banana | 12 | 1.99 |
| 3 | Cherry | 9 | 4.99 |

Execute the commands to store this information in Redis. Make sure to namespace your key and each of the fields should be retrievable under the key used.

1. Select the most appropriate Redis data structure to store the following information:

The 2018 Golden Snowball Competition for the Upstate NY City with the Highest Snowfall. Scores updated hourly.

|  |  |  |  |
| --- | --- | --- | --- |
| City | Syracuse | Rochester | Buffalo |
| Snowfall Inches | 97 | 68 | 84 |

Execute the commands to store this information in Redis. Make sure to namespace your key and each of the snowfall values should be updatable. For example, you should be able to add 10 inches to Buffalo to make it 94. You should be able to display the information upon request.

# Turning it in

Take your copy and paste each of the solutions to the exercises into the submission template file included with this assignment. Make sure your name and SU email are at the top and turn in your work through the course learning management system.

# Tear-Down

When you are finished with the homework you should stop the environment:

1. From the terminal window where you typed docker-compose up -d type in the following:  
   docker-compose stop