MongoDB practical session

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Part 1. Lab tools :

- **MongoDB server** Community, v8.x (**download the package zip on Windows or tgz on MacOS/Linux**) : https://www.mongodb.com/try/download/community .
- **MongoDB Shell** (a command-line tool for connecting to the database): Download the ZIP package for Windows or the TGZ package for macOS/Linux from https://www.mongodb.com/try/download/shell .
- **MongoDB Database Tools**: Used for loading data (download the ZIP version), available from https://www.mongodb.com/try/download/database-tools.
- A **code editor** for writing non-autocorrecting code (e.g., Notepad++, Sublime Text, VS Code, Emacs, Notepad, Eclipse, etc.). Avoid text editors like MS Word, LibreOffice, or Google Docs that may modify your text without informing you.
- The **MongoDB client**: Studio 3T Free, downloadable from https://studio3t.com/download-studio3t-free.

Preparation

You will need at least two command line prompts (invite de commande (Windows), Terminal (MacOS), Bash (Linux)) .

Install the server (follow the instructions below), Start the server and let it run. Install the client and test your connection. Import the data from the `velov_geo.json` file provided with the lab statement. You can start answering the questions.

A. Installing and Launching the MongoDB Server

Install the MongoDB Server

- Download the MongoDB server from the link provided earlier (zip archive).
- Unzip the archive
- Note the installation directory (referred to as `MongoDBServerHome`).
- Unzip the server archive to the `MongoDBServerHome`
- Eventually refer to the official installation documentation for detailed steps.

Create a Data Directory

- Set up a directory to store MongoDB data. Typically, use `C:\data\db`.
- This directory is referred to as `MongoDBDataDir`.

Start the MongoDB Server from the Command Line

- Detailed instructions are available in the official guide.

Steps to Run MongoDB:

a. On Windows, open a Command Prompt:

- Press `Windows + R`, type `cmd`, and press `Enter`.

On MacOS or Linux open a Terminal.

b. Navigate to the `bin` directory inside the MongoDB installation folder (`MongoDBServerHome\bin`) by using the `cd` command:

```
cd <MongoDBServerHome>\bin
```

(Replace `<MongoDBServerHome>` with the actual installation directory path.)

c. Start the MongoDB server by typing:

```
mongod --dbpath "MongoDBDataDir"
```

(Replace `"MongoDBDataDir"` with the path to your MongoDB data directory created in step 2.)

d. JSON-formatted messages will appear in the Command Prompt. The last message should end with something like:

```
..."ctx":"listener","msg":"Waiting for
connections","attr":{"port":27017,"ssl":"off"}}
```

e. The MongoDB server is now running locally and is listening for connections on port **27017**.

Connecting to the MongoDB Server and Creating the Database for Practice

Steps to Connect and Create the Database

Install the MongoShell client

- Download the MongoShell client from the link provided earlier (zip archive).
- Unzip the client to a directory noted `MongoDBClientHome`

Open a New Command Prompt

- Press `Windows + R`, type `cmd`, and press `Enter`.

Navigate to the MongoDB `bin` Directory

- Unzip the MongoShell zip package In the Command Prompt, move to the `bin` directory inside the MongoDB installation folder (`MongoDBClientHome\bin`) using the `cd` command:
- `cd < MongoDBClientHome >\bin`

  (Replace `< MongoDBClientHome >` with the actual installation directory path.)

Launch the MongoDB Client

- Start the MongoDB client by typing:
- `mongosh`
- After a few messages, a prompt with the > symbol will appear, indicating that you are connected to the MongoDB server.

Create the Database

- At the > prompt, create the database for the practice session by typing:
- `use mongoLab`
- The output will confirm that you have switched to the database `mongoLab`. If the database does not already exist, this command will create it.

You are now connected to the MongoDB server and have successfully created the `mongoLab` database.

Populating the Database

Steps to Import Data into the MongoDB Database

1. **Unzip MongoDB Database Tools**
   - Extract the ZIP file containing the MongoDB Database Tools.
2. **Move the `mongoimport` Executable**
   - Locate the `mongoimport.exe` file (or its equivalent for your OS) in the unzipped tools folder.
   - Move it to the `MongoDBServerHome\bin` directory, where `mongod.exe` is located.
3. **Copy the Data File**
   - Copy the `velov_geo.json` file from the TP archive into the `MongoDBServerHome\bin` directory.
   - This file contains JSON documents describing the Vélo'V stations. *(These data were available on the Grand Lyon data site on January 11, 2021, under this dataset.)*
4. **Open a New Command Prompt**
   - Press `Windows + R`, type `cmd`, and press `Enter`.
   - Navigate to the `MongoDBServerHome\bin` directory:
   - `cd <MongoDBServerHome>\bin`
5. **Ensure Required Files Are in Place**
   - Verify that both the `mongoimport` executable and the `velov_geo.json` file are in the `MongoDBServerHome\bin` directory.
6. **Run the Data Import Command**
   - From the Command Prompt (not the MongoDB client), execute the following command to import the data:

```
mongoimport --db mongoLab --collection velov_geo --file
"velov_geo.json"
```

   - This command will:
     - Create the `mongoLab` database if it does not already exist.
     - Create the `velov_geo` collection.
     - Insert the documents from the `velov_geo.json` file into the collection.
   - **Note**:

- You can run `mongoimport` from any location if its path is added to your system's `PATH` environment variable.
- Ensure the `--file` parameter points to the full path of the JSON file if it is not in the current directory.

7. **Verify the Data Import**
   - Open the MongoDB client (`mongosh`) as described earlier.
   - Switch to the `mongoLab` database:
   - `use mongoLab`
   - List the imported data using the command:
   - `db.velov_geo.find().pretty()`
   - You should see JSON documents with Vélo'V station information displayed, along with the message:
   - `Type "it" for more`
8. **Database Creation and Population Complete**
   - Your `mongoLab` database is now fully created and populated with the `velov_geo` collection containing the Vélo'V station data.