

Lab 5: NoSQL Databases – MongoDB (Modern Version)

1. Objective

This lab guides you through installing and configuring MongoDB, connecting to the server, and performing basic Create, Read, Update, and Delete (CRUD) operations.

2. Installation and Setup

Instead of the old manual .zip method, we will use modern installers that automatically set up MongoDB as a background service.

■ ■ For Windows (Recommended)

Download: Go to the official MongoDB Community Server Download page.

Select: Choose the "MSI" package (not the ZIP) and click Download.

Install: Run the installer.

- Choose the "Complete" setup.

- Ensure "Install MongoDB as a Service" is checked.

(Optional) You can also install MongoDB Compass, a GUI tool.

■ For Linux (Ubuntu/Debian)

Do not use apt install mongodb. Use the official MongoDB repository for the correct version.

Import GPG Key:

```
curl -fsSL https://www.mongodb.org/static/pgp/server-7.0.asc | \
  sudo gpg -o /usr/share/keyrings/mongodb-server-7.0.gpg \
  --dearmor
```

Add MongoDB Repository:

```
echo "deb [ arch=amd64,arm64 signed-by=/usr/share/keyrings/mongodb-server-7.0.gpg ] https://re
```

Install MongoDB:

```
sudo apt-get update
sudo apt-get install -y mongodb-org
```

Start the Service:

```
sudo systemctl start mongod
sudo systemctl enable mongod
```

■ For macOS (Homebrew)

Tap the MongoDB Formula:

```
brew tap mongodb/brew
```

Install MongoDB:

```
brew install mongodb-community
```

Start the Service:

```
brew services start mongodb-community
```

3. Connecting to the Client (Mongo Shell)

The old client (mongo.exe) is deprecated. The new client is mongosh. Since the server runs as a background service, you don't need to manually start mongod.exe. Open a terminal and run:

```
mongosh
```

4. CRUD Operations

Let's perform the operations from your lab guide.

a. Create a Database

Create and select a new database named info.

```
use info
```

b. Create a Collection (Insert Documents)

```
db.produits.insertMany([
  {
    nom: "Macbook Pro",
    fabricant: "Apple",
    prix: 11435.99,
    options: ["Intel Core i5", "Retina Display", "Long life battery"]
  },
  {
    nom: "Macbook Air",
    fabricant: "Apple",
    prix: 125794.73,
    ultrabook: true,
    options: ["Intel Core i7", "SSD", "Long life battery"]
  },
  {
    nom: "Thinkpad X230",
    fabricant: "Lenovo",
    prix: 114358.74,
    ultrabook: true,
    options: ["Intel Core i5", "SSD", "Long life battery"]
  }
])
```

c. Read (Query) Documents

```
db.produits.find().pretty()
db.produits.findOne()

let thinkpad = db.produits.findOne({ nom: "Thinkpad X230" })
db.produits.find({ _id: thinkpad._id })

db.produits.find({ prix: { $gt: 13723 } })
db.produits.findOne({ ultrabook: true })
db.produits.find({ nom: { $regex: "Macbook" } })
db.produits.find({ nom: { $regex: "^Macbook" } })
```

d. Delete Documents

```
db.produits.deleteMany({ fabricant: "Apple" })
db.produits.deleteOne({ _id: thinkpad._id })
db.produits.find()
```