Day 7 Coding Assignment — MongoDB Data Modeling and CRUD Operations

Duration: 50-60 Minutes

Focus Areas: Introduction to NoSQL, MongoDB CRUD Operations, and Data Modeling

---

Scenario Background

You have joined *BookVerse*, a startup building a digital platform for managing online book collections, authors, and user reviews.
  As part of the backend team, you are responsible for creating and managing the MongoDB database that powers the platform's data layer.

User Stories and Tasks

User Story 1 — Database Setup and Data Modeling

As a developer, I need to design the MongoDB collections to efficiently represent books, authors, and reviews in a NoSQL structure.

Tasks:

1. Create a new MongoDB database named BookVerseDB.

2. Define the following collections and structure them using proper schema modeling principles:

○ **Authors:** { _id, name, nationality, birthYear }

- **Books:** { _id, title, genre, publicationYear, authorId, ratings: [{ user, score, comment }] }

- **Users:** { _id, name, email, joinDate }

3. Ensure one-to-many relationships are implemented using **references (authorId)** and **embedded documents (ratings)**.

4. Insert a few sample documents (at least 3 authors, 5 books, 3 users).

Concepts Covered: NoSQL structure, MongoDB data modeling

User Story 2 — CRUD Operations

As a backend developer, I need to perform basic Create, Read, Update, and Delete operations on the collections.

Tasks:

1. Insert new users and books into the database.

2. Retrieve all books of the genre "Science Fiction".

3. Update the publicationYear of one book.

4. Delete one user record from the collection.

5. Add a new rating to a book document using the $push operator.

Concepts Covered: CRUD operations, update modifiers

User Story 3 — Querying and Filtering Data

As an application developer, I need to query data for the web interface based on filters.

Tasks:

1. Retrieve all books published after 2015.

2. Find authors who have written books in the "Fantasy" genre.

3. Retrieve all users who joined within the last 6 months.

4. Find books with an average rating greater than 4.

Concepts Covered: Query filters, conditional operators, nested field access

---

Expected Deliverables

- MongoDB shell or Compass screenshots showing:

○ Database and collection creation

○ CRUD and filter query outputs

- Exported `.json` file for collections (Authors, Books, Users)

- Documented steps or a `.md`/`.txt` file summarizing queries used

---

Self-Evaluation Checklist

Criteria	Self-Rating (✔/✗)	Notes
Collections follow logical data modeling structure		

Used appropriate references and embedded documents		
CRUD operations performed successfully		
Filter and query operators applied correctly		
Queries return expected results without syntax errors		

Bonus Challenge (Optional)

1. Write a query to display the top 3 most-rated books.

2. Write a script using Node.js and Mongoose to insert data into the collections.