Assignment 3 – MongoDB Implementation

Weight: 10% of Total Marks
Due Date: Thursday, 29 May 2025 by 9:00 PM (Singapore Time)

Scope

This assignment involves:

- Creating hierarchical BSON documents
- Performing basic MongoDB queries
- Implementing aggregation queries and cursor operations
- Manipulating BSON documents in MongoDB

Assessment Criteria

Marks will be awarded for:

- **Correctness** of implementation
- **Comprehensiveness** of data and results
- **Appropriate** application of course material

Submission Format

Submit the following four files:

- A3Sol1.js
- A3Sol1Output.txt
- A3Sol2.js
- A3Sol2Output.txt

Compress them into a **single ZIP file** named:

<StudentNumber>_A3.zip

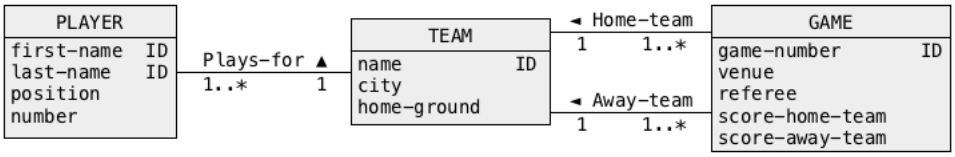
Submit the ZIP file via **Moodle**.

Task 1: Creating and Inserting BSON Documents

(4 marks)

Requirements

1. Refer to the conceptual schema describing:
    - Sport teams
    - Players in teams
    - Games played by teams



2. Implement BSON documents for:
    - **2 teams**
    - **2 players per team**
    - **2 games**
3. Ensure the documents:
    - Follow the schema naming (class names, associations, identifiers)
    - Use **hierarchical structure** wherever possible
4. Create a MongoDB script file named A3Sol1.js that:
    - Inserts the BSON documents into a MongoDB collection
    - Displays the inserted documents using printjson() in a **pretty format**
5. Save the script execution output using:

    mongosh "mongodb://localhost:27017/myDB" --file "D:/mongoDBScripts/A3Sol1.js" > D:/mongoDBScripts/A3Sol1Output.txt

    Replace "myDB" and paths as needed.

Deliverable

- A3Sol1Output.txt — must contain:
    - Results from running the script
    - No errors
    - All statements processed
    - Output in printjson() pretty format

Task 2: Aggregation and Querying

(6 marks)

Preliminary

- Use the provided script **subject(2025May).js** (in the assignment folder) to populate your MongoDB with data related to **subjects, assessments, and textbooks**.
- Explore the data to understand its schema (e.g., UML diagram). You don't need to submit the schema.

Query Tasks
(Each worth 0.6 marks)

Write **aggregation** queries in A3Sol2.js to:

1. Count total number of subjects
2. Count subjects with **no prerequisites**
3. Count subjects worth **more than 3 credit points**
4. Find **subject title, type, and credit** of the subject with the **highest credit**
5. List **subject title, type, credit** where credit = 3, sorted by title (ascending)
6. For each subject type, count total number of subjects
7. Find **ISBN and title** of books published in **2012**
8. Find **title, author, and type** of books used in **CSCI235**
9. Find **ISBN, title, and publisher** of books with **2 to 3 authors**
10. List **subject code, title of book, and publisher**, sorted by:
    - subject code (ascending)
    - publisher (descending)

Execution Command

mongosh "mongodb://localhost:27017/myDB" --file "D:/mongoDBScripts/A3Sol2.js" > D:/mongoDBScripts/A3Sol2Output.txt

Deliverable

- A3Sol2Output.txt — must contain:
    - Results from running A3Sol2.js
    - All 10 queries with results using printjson()
    - No errors

Late Submission Policy
Refer to the subject outline for the late submission policy.

Submissions

This assignment is due by 9:00 pm (Singapore time) on Thursday, 29 May 2025.

Zip all your solutions (A3Sol1.js, A3Sol1Output.txt, A3Sol2.js, A3Sol2Output.txt) into a zipped file with a name <StudentNumber_A3.zip>. Submit the zipped file through Moodle in the following way:

1) Access Moodle at http://moodle.uowplatform.edu.au/
2) To login use a Login link located in the right upper corner of the Web page or in the middle of the bottom of the Web page
3) When successfully logged in, select a site CSCI235 (SP225) Database Systems
4) Scroll down to a section Submissions of Assignments
5) Click at **Submit Your Assignment 3** here link.
6) Click at the button **Add Submission**
7) Move a file, for example, YourName_A3.zip into an area provided for your submission.
8) Click at a button **Save changes**
9) Click at a button **Submit assignment**
10) Click at the checkbox with a text attached: By checking this box, I confirm that this submission is my own work, … in order to confirm authorship of your submission.
11) Click at a button Continue.

A policy regarding late submissions is included in the subject outline.

Only one submission per student is accepted.

Assignment 3 is an individual assignment, and it is expected that all its tasks will be solved individually without any cooperation with the other students. Plagiarism is treated seriously. Students involved will likely receive zero. If you have any doubts, questions, etc. please consult your lecturer or tutor during lab classes or over e-mail.

End of specification