# CS6.201 Introduction to Software Systems

## Lab Activity 2

### 12, February 2025
### MongoDB CRUD Operations

**Database:** `sample_mflix`
**Collections:** `movies`, `embedded_movies`, `sessions`, `theaters`, `users`

## Total Marks: 20         Time: 2 Hours

### Instructions:

- Perform all tasks using **MongoDB Shell** and **MongoDB Atlas**.

- import the sample movie database sample_mflix from mongo atlas

- Each student must use their **own details** where required.

- **Save each task's query and output as separate files** in the following format:

  - `questionX_input.txt` → Query used
    (e.g., `question1_1_input.txt`, `question2_2_input.txt`)

  - `questionX_output.png` → Screenshot of output or `questionX_output.json`

- After completing all tasks, export the modified movies collection as JSON.

- We expect you to solve the questions in a sequece as we are working on a database, if you want to skip some questions, mention it in assumptions.md and share it along with the files.

- **Plagiarism will result in zero marks.**

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Congratulations! You are done with training phase in NoSQL and you have been assigned as an intern at MAlloc (Movie Alloc). MAlloc uses NoSQL. As an intern, you need to do some tasks by writing NoSQL queries in order to gain points.

# Tasks

## Task 1: Create (Insert Data) [1 Marks]

Our company has received a new request to create and insert the data of a new movie that has been released. Follow the details below and accomplish the task.

1. Insert a new movie into the **movies** collection with the following structure:

```
{
    "title": "Movie by [Your First Name]",
    "year": 2025,
    "genres": ["Your Favorite Genre", "Your Second Favorite Genre"],
    "runtime": [Your Age * 5],
    "director": "[Your Full Name]",
    "actors": ["Actor1", "Actor2"]
}
```

## Task 2: Read (Query Data) [2 Marks]

Great! that was impressive. Now, your manager needed the details of the movies with below properties. So, why late? Go and accomplish this task too.

1. Find **all movies** released in **(1920 + Last Digit of Roll No.)**.

2. Find **5 movies** with a runtime greater than **(last digit of Roll No. * 10) minutes**.

## Task 3: Read (Find Specific Data) [3 Marks]

Good that you have done the previous task with ease. Now, the inspection team is here. They asses the skills of interns. They are asking you to write a query for the following tasks. Go ahead and prove yourselves.

1. Find a movie whose title contains **the first three letters of your first name** (case-insensitive).

2. Find **3 movies** where the genre is `"Comedy"`.

3. Find a movie directed by `"Christopher Nolan"`.

## Task 4: Update (Modify Data) [3 Marks]

The inspection team was happy with your skills! But, boss found out few mistakes in the data that's been in the database and wants you to correct immediately. Below are the details, do it ASAP.

1. Increase the runtime of the movie `"Destry Rides Again"` by **(Last Digit of Roll No. * 5) minutes**.

2. Update the IMDb rating of **one movie** to 8 where the rating less than 7.5.

3. Add a new field `"box_office"` with a value of `"$500M"` to **any movie released in your birth year**.

### Task 5: Delete (Remove Data) [3 Marks]

Great that you have are with correcting the database. Now, memory management team has come up with some of the entries in the database that are not needed. So, remove them from the database.

1. Delete the movie with the title `"The Great Train Robbery"`.

2. Delete **all movies** with an IMDb rating less than **7.5**.

3. Delete **any movie** released before the year **(Your Birth Year - 5)**.

### Task 6: Aggregation Queries (Advanced) [6 Marks]

Wow! the memory has been saved. Now, boss is requesting for the below stats. Quickly get them.

1. Find the **total count of movies** for each genre.

2. Find the **average IMDb rating** of all movies released after 1920.

3. Find the **top 3 directors** who have directed the most movies.

### Task 7: Export Data [2 Marks]

Yay! You did a great job. Now, the analytics team wants the movies collection in a JSON format. So, export the data into JSON format.

1. Export the `movies` collection as a JSON file using `mongoexport`.

# Submission Requirements

## 1. Push to GitHub

- Upload all `questionX_input.txt` files.

- Upload all `questionX_output.png` screenshots / `questionX_output.json`.

- Upload `updated_movies.json`.

## 2. Submit a ZIP file to Moodle

- Create a ZIP file containing all required files.

- Submit it before the deadline.

# Important Notes

- **Plagiarism Policy:** Each student's queries and outputs must be unique.

- If two students submit the same output, both will receive zero marks.

**Deadline:** All submissions must be completed before **12/02/2025 & 05:00 PM**.

Congratulations! Your internship period with MAlloc is done. Now, time to await till you know the points you gained here. All the best!