EIU

EASTERN INTERNATIONAL UNIVERSITY
SCHOOL OF COMPUTING
AND
INFORMATION TECHNOLOGY

Week 6 Practice Assignment – Quarter 2, 2025-2026
Method: LAB 5 Practice 5
Course Name: Advanced Databases
Course Code: CSW 436
Student's Full Name:
Student ID:

Important Instructions –

- Implement each question using MongoDB.
- find(), update(), delete().
- Use $group, $count, $avg, $max and other NoSQL method for query processing and optimization.
- Document all question Output/results properly by capturing the screenshots of the output/results and NoSQL code for every question in a Word / PDF document and save it.
- After completing all questions, upload the document to Moodle.

Topic: Key-value databases and Document databases

1. Create Database & Collection
   - Create a database named schoolDB
   - Create a collection called students

2. Insert Documents
   - one document using insertOne()
   - multiple documents using insertMany()
   - Insert 5 student documents with:
     - name
     - age
     - department
     - marks
     - email

3. Find Data
   - Write queries to:
     - Display all students
     - Display only name and marks
     - Find student with age > 20
     - Find students from "Computer Science" department
     - Find one student using email

4. Update Data
   - Write queries to:
     - Update marks of one student

- Increase all students' marks by 5
- Add new field status: "active" to all students

5. Delete Data
   - Write queries to:
     - Delete one student by name
     - Delete all students with marks < 40

6. Filtering with Operators
   - Write queries using:
     - $gt, $lt
     - $in
     - $and, $or
     - $ne
   - Tasks:
     - Students with marks between 60 and 90
     - Students not from "Mechanical"
     - Students from "CS" or "IT"

7. Sorting & Limiting
   - Sort students by marks descending
   - Show top 3 students
   - Skip first 2 and show next 3

8. Arrays Practice
   - Add field:
     - subjects: ["DBMS", "OS", "CN"]

Tasks:
- Find students who have "DBMS"
- Add new subject
- Remove one subject

9. Embedded Documents

- Add:

address: {
  city: "Ho chi Minh",
  pincode: 234569
}

Tasks:
- Find students from Delhi
- Update pincode
- Add street field

10. Aggregation Framework

Use aggregate() to:

- Count total students
- Find average marks
- Find highest marks
- Group students by department and count them
- Find department with highest average marks

11.Indexing

- Create index on email
- Create compound index on department + marks
- Explain why indexing is useful

12.Relationships

Create:

- courses
- enrolments

Tasks:

- Insert courses
- Enrol students
- Use $lookup to join students with courses

13.Build Student Result Management System

Students must:

- Insert 20 records
- Query failed students
- Top 5 scorers
- Department wise average
- Update results
- Delete graduated students
- find(), update(), delete().
- Use $group, $count, $avg, $max,