MongoDB Project Assignment

- MERN Stack Preparation Project
  - E-Learning Platform Database Design
  - Mini Capstone Project

Project Objective

- Design MongoDB database for E-Learning platform
  - Prepare backend for MERN stack integration
  - Apply real-world schema design principles

Project Scenario

- Platform similar to Udemy
  - Manage Students & Instructors
  - Manage Courses, Lessons, Enrollments
  - Handle Reviews, Categories & Payments

Collections to Create

- users
  - courses
  - lessons
  - enrollments
  - reviews
  - categories
  - payments

Users Collection

- Fields: name, email, password
  - role: student | instructor
  - createdAt, isVerified
  - Email must be unique

Courses Collection

- title, description, price
  - instructorId (ref users)
  - categoryId (ref categories)
  - rating, totalStudents, level

Lessons Collection

- courseId (ref courses)
  - title, videoUrl
  - duration, order

Enrollments Collection

- studentId (ref users)
  - courseId (ref courses)
  - enrolledAt, paymentId

Reviews Collection

- courseId, studentId
  - rating (1–5)
  - comment, createdAt

Payments Collection

- studentId, amount
  - paymentStatus, transactionId
  - createdAt

Phase 2: CRUD Operations

- Insert sample data
  - Read complex queries
  - Update records
  - Delete operations

Aggregation Tasks

- Top 3 highest rated courses
  - Total revenue per course
  - Instructor-wise earnings
  - Monthly revenue report

Indexing & Optimization

- Index on email
  - Compound index on courseId & studentId
  - Use explain()
  - Compare performance

Validation & Security

- Use $jsonSchema validation
  - Rating between 1 and 5
  - Default values
  - Unique constraints

Evaluation Criteria

- Schema Design – 20 Marks
  - CRUD – 20 Marks
  - Aggregation – 25 Marks
  - Indexing – 15 Marks
  - Validation – 10 Marks
  - Documentation – 10 Marks

Outcome

- Ready for MERN backend development
  - Strong MongoDB foundation
  - Real-world project experience