Lab 6

SkillForge UML Design Report

Course: Programming II (CC272)

Faculty: Faculty of Engineering, Alexandria University

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1.Use Case Diagram:

Description: The use case diagram shows how instructors, administrators, and students interact with the main features of SkillForge, which include course management, student enrollment, quiz administration, certificate issuance, and statistical tracking. It clearly defines the limits of what each actor can achieve while offering a visual depiction of the system's capabilities. By providing a broad overview of user-system interactions and creating a structure for in-depth design and coding work.

Student Use Cases:

Browse Courses - Students can view and search through all available courses on the platform to find courses that match their learning interests.

Enroll in Course - Students can register themselves in a selected course to gain access to its lessons and quizzes (this always includes browsing courses first).

Complete Lesson - Students can work through and finish individual lessons within their enrolled courses, accessing the lesson content and resources.

Complete Quiz - Students can attempt quizzes to test their understanding of the course material and demonstrate their knowledge.

Earn Certificate - Students receive a digital certificate after successfully completing all lessons and passing all quizzes in a course.

View Analytics - Students can access their personal learning statistics, including completed courses, time spent learning, and quiz performance grades.

View Progress - Students can monitor their course completion status by displaying which lessons and quizzes they have completed and their overall progress.

Instructor Use Cases:

Create Course - Instructors can design and set up new courses on the platform, defining the course structure and requirements.

Manage Course - Instructors can edit, update, or organize their existing courses, including modifying course details and structure.

Upload Lesson - Instructors can add new lesson content, including text, resources, and materials to their courses.

Design Quiz - Instructors can create quizzes with multiple questions to evaluate student understanding and learning progress.

Admin Use Cases:

Manage Users - Admins can create, modify, suspend, or delete user accounts for students and instructors on the platform.

Approve Course - Admins can review and approve instructor-created courses, making them visible and available to students.

Remove Course - Admins can delete or hide courses from the platform that violate policies or are no longer appropriate.

Monitor Platform Analytics - Admins can view system-wide statistics and reports about user activity, course popularity, and overall platform performance.
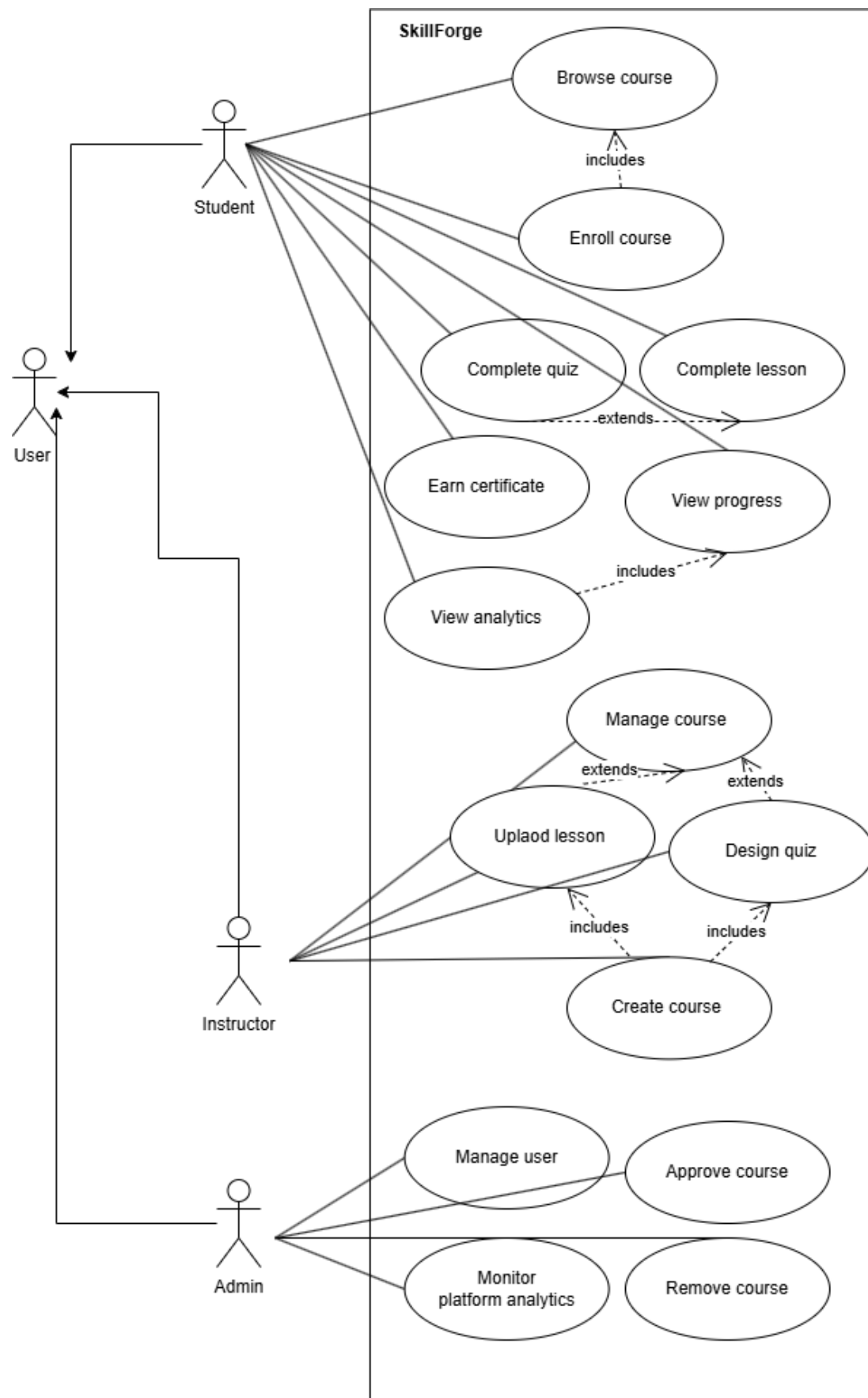
Figure 1:Use Case Diagram

2.Activity Diagram:

Use case: Enroll in a course

Description: the UML describes the enroll in a course process , student logs in then the available courses appear , he selects then the sytsem checks if enrolled or not and if course is open or not , system outputs the decision if both are yes enrollment is succesful and database is updated else process ends.
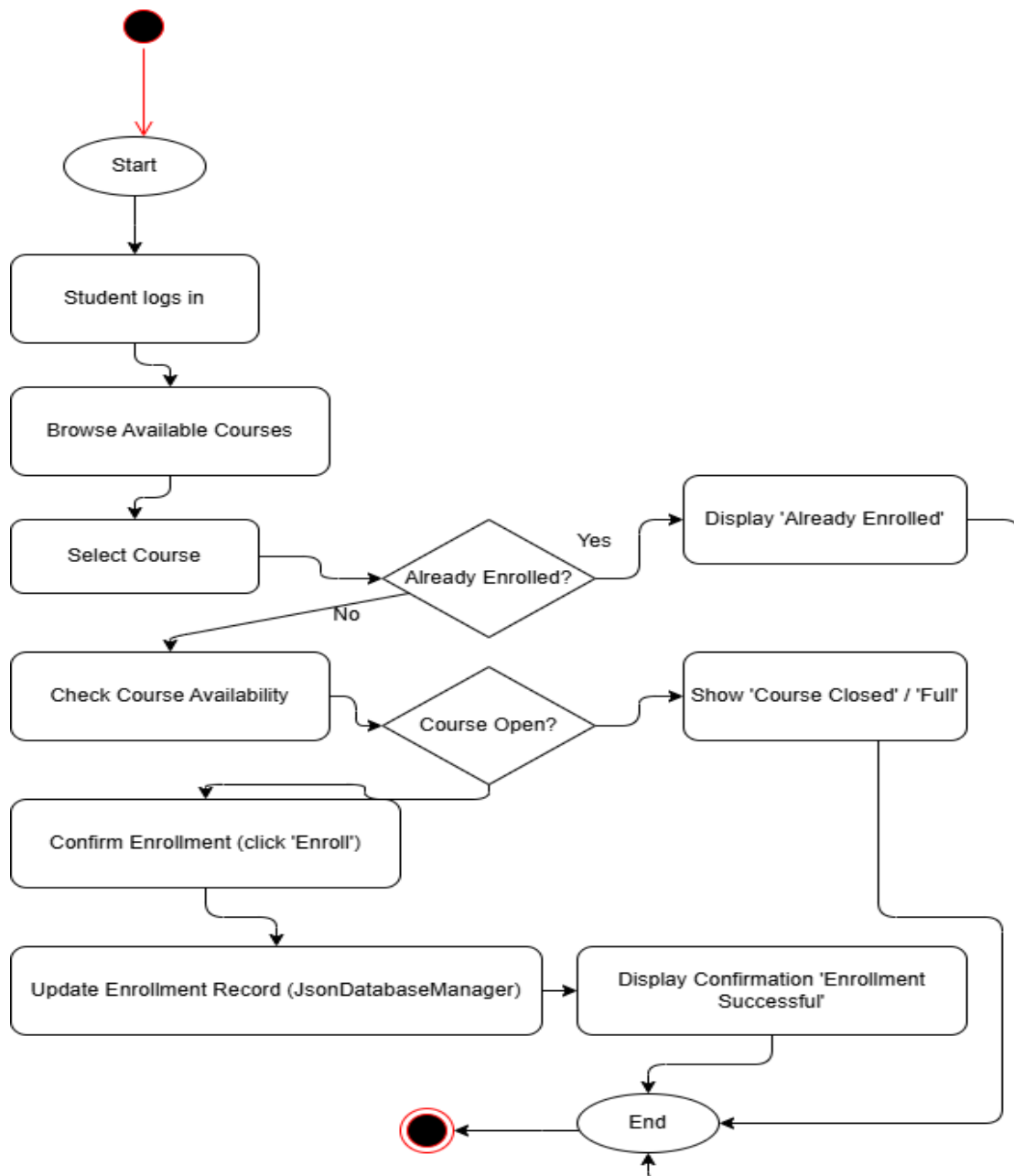

Figure 2:Activity Diagram

3.Class Diagram:

Description:

This class diagram illustrates how users (Students, Instructors, and Admins) interact with system entities such as Courses, Lessons, Quizzes, Certificates, and Analytics and their relations between each other. It defines how data and functionality are organized within the system.
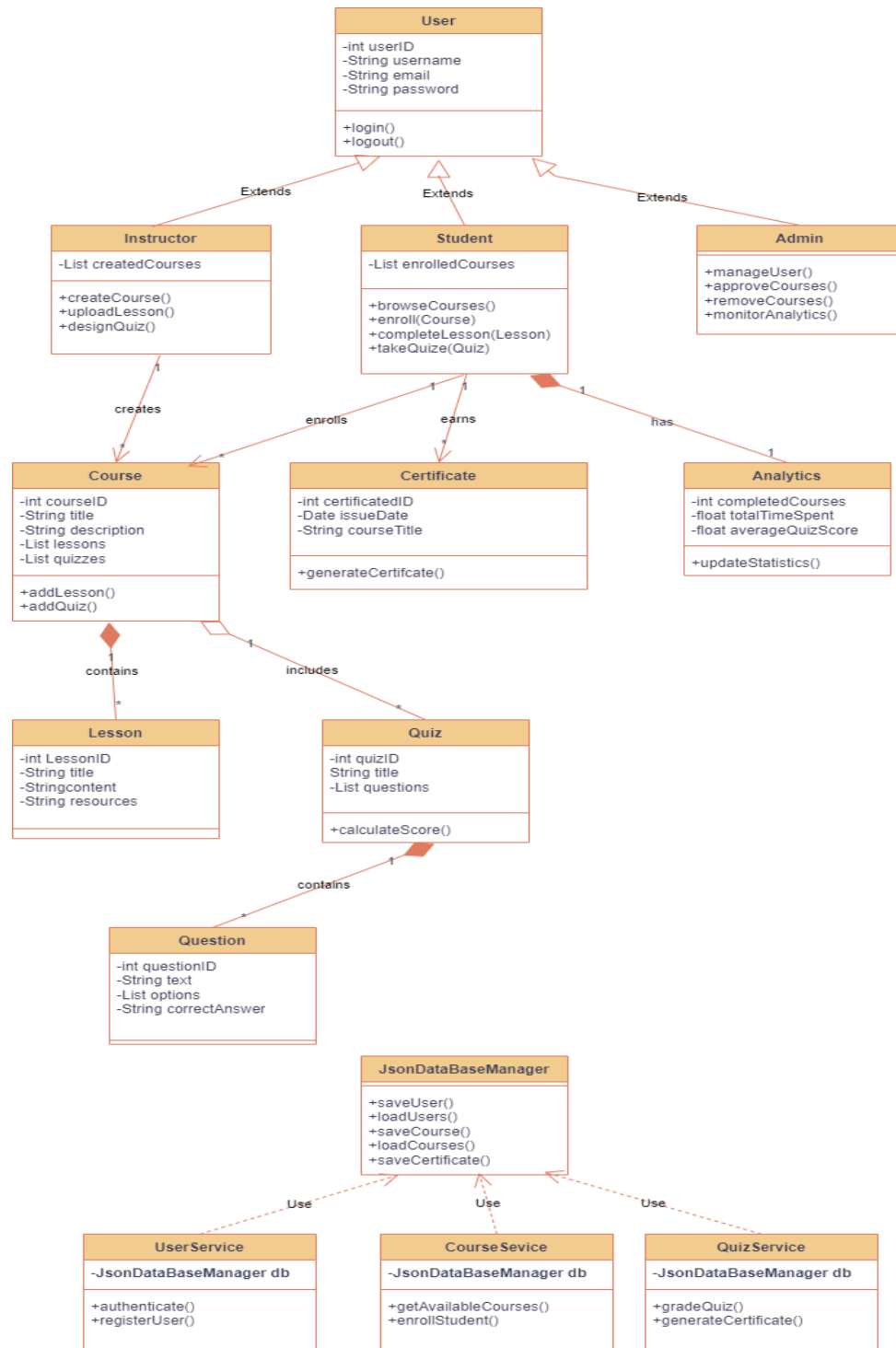

Figure 3:Class Diagram

4.Sequence Diagram:

<u>Use Case:</u> Enroll in a course

<u>Description:</u>

The student initiates the request through the CourseService, which verifies course availability by querying the JsonDatabaseManager. If the course is available, the student is added to the course list and the Course object is updated, followed by an enrollment confirmation. If the course is unavailable, the system notifies the student accordingly.
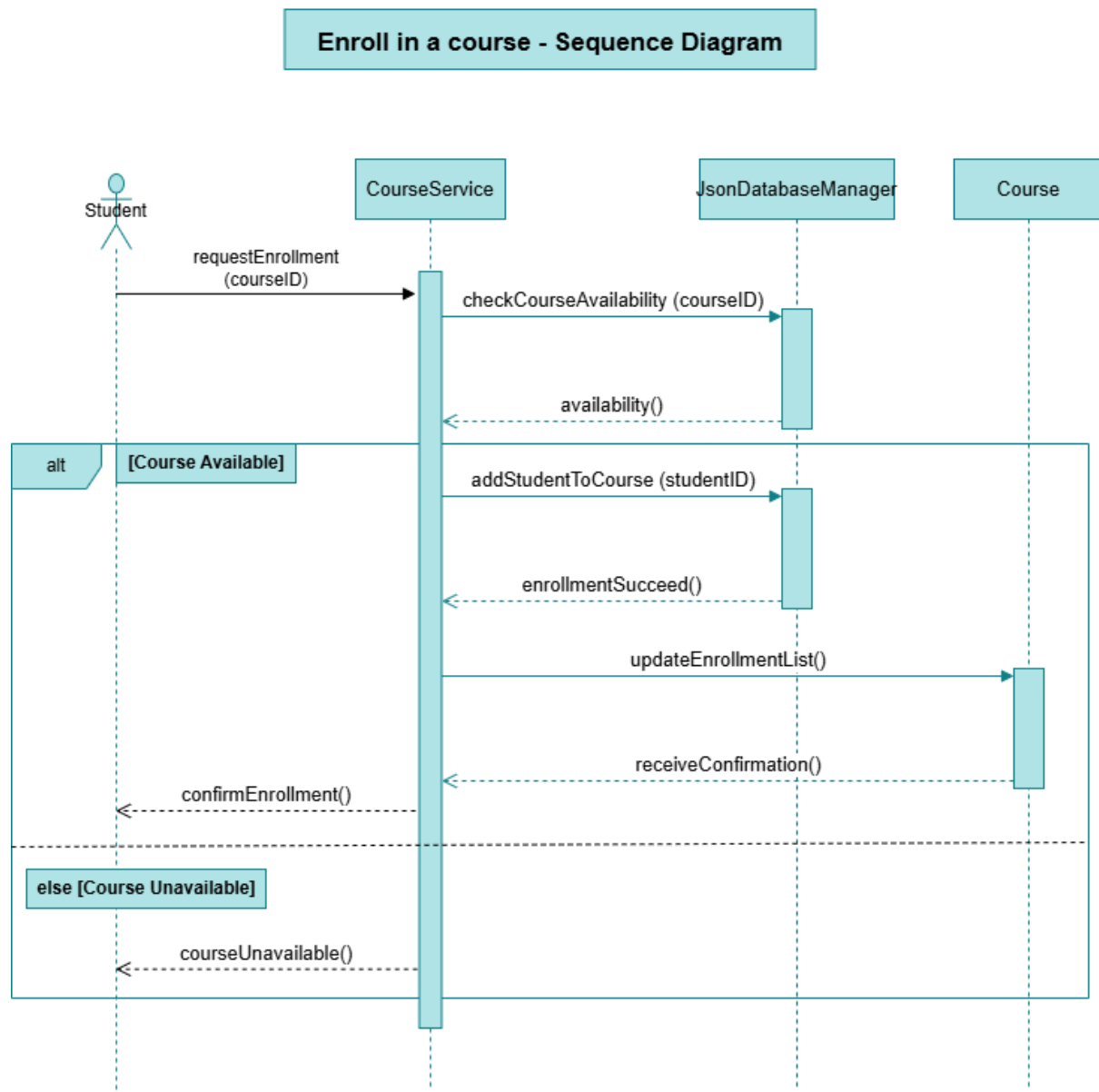

Figure 4:Sequence Diagram