



Subject Name: Software Engineering -1	First Semester 2022-2023	Level: 3	Lab Exam
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Software Engineering Project

Team Name	TEST
Project Title	Learning Management System
Department	IS

No.	Student Name	Role
1	Sahar Gamal Tawfik	
2	Hisham Mahmoud Khirallah	
3	Mahmoud Ezzat Mohammed shaaban Ali	
4	Noura Abd El Rahman Zakaria	
5	Sahar Gamal Tawfik	
6	Omnia Mohammed Tawfik	

1-Problem Statement

The ongoing project focuses on the development of a Learning Management System (LMS) designed to streamline online courses and learning resources for students. This case study outlines the business and security requirements for the LMS database system, emphasizing the efficient management of course



information, user registration, attendance tracking, testing, and payment processing, all while maintaining robust content security measures.

2.Introduction

2.1 Purpose

the purpose of the e-learning platform is to provide online educational services to school students. The platform aims to enable users to have comprehensive access to learning content and educational resources, such as downloading course materials and watching educational videos by subscribing to courses.

Platform functionality includes user interactions such as registering, deleting courses, studying videos or PDF lessons, taking quizzes, and participating in online assessments.

Administrators have the ability to create reports to evaluate students' performance in courses they are enrolled in. Detailed records are kept of user progress and course performance, including information about registered courses and exam dates, facilitating efficient course management for users.

Instructors are enabled to record courses and organize content into sections, with each section containing several lessons. Each lesson includes video tutorials and PDF documentation. After each lesson, students must take a quiz to evaluate their understanding of the lesson content. This structured and comprehensive method ensures a systematic and comprehensive presentation of educational materials, combined with multimedia elements and assessments to enrich the learning experience.

After the tests are completed, the application calculates the results and displays them to users, while at the same time sending notifications to administrators with results updates. The administrator can then update scores and proficiency levels and recognize outstanding achievements with badges and rewards.

User-related data is systematically recorded, enabling graphical reports showing overall user performance.



To enhance user engagement, registered users actively participate in forums, participate in discussions, peer-to-peer forums, and contact the administrator for any queries. An innovative feature includes offering discounts on upcoming courses to individuals who excel in exams, to provide an incentive for outstanding performance.

To ensure the security and integrity of the content, measures will be implemented to protect videos from unauthorized downloading or recording. In addition, measures will be put in place to prevent users from registering the same account on more than one device. These security features are intended to maintain the confidentiality of educational materials and enhance the integrity of the overall e-learning platform.

2.2 Definition

- **E-Learning** => Electronic Learning
- **LMS** => Learning Management System

2.2 Overview

This project centers on the creation of an e-learning platform designed to deliver online educational services to school students. Upon logging in, users attain comprehensive access to the platform, unlocking features such as downloading course materials and viewing educational videos through course subscriptions.

Platform functionality encompasses user interactions like course registration, deletion, studying video or PDF lessons, taking tests, and participating in online assessments.

Administrators possess the capability to generate reports for assessing student performance within enrolled courses. The system maintains detailed records of user progress and course performance, including information about registered courses and examination dates, facilitating effective course management for users.



Instructors are equipped with the ability to record courses and organize content into sections, with each section containing multiple lessons. Each lesson includes educational videos and PDF documents. Following the completion of each lesson, students are required to take a quiz, assessing their comprehension of the lesson content. This structured approach ensures a systematic and comprehensive presentation of educational materials, integrating multimedia elements with assessments to enrich the learning experience.

Upon completion of tests, the application calculates and displays results to users, concurrently notifying administrators for result updates. The administrator can then update results and proficiency levels and recognize outstanding achievements with awards and rewards.

Comprehensive user-related data is systematically recorded, enabling the generation of graphical reports illustrating average user performance.

To promote user engagement, registered users actively contribute to forums, participate in discussions, view posts from peers, and contact the administrator with any inquiries. An innovative feature includes offering discounts on upcoming courses to individuals who excel in exams, providing an incentive for exceptional performance.

To ensure the security and integrity of the content, measures will be implemented to protect videos from unauthorized downloading or recording. Additionally, safeguards will be in place to prevent users from registering the same account on more than one device. These security features aim to maintain the confidentiality of the educational materials and enhance the overall integrity of the e-learning platform.

2.2 Process Model

1. Requirements analysis: The project requirements are analyzed and the features and functions required for the e-learning platform are determined. The needs of users (students, teachers, administrators) are identified and documented.

2. Design: The structure of the user interface is designed and the internal operations of the platform are defined. This design includes organizing the content, designing the database, and determining the technology used.

3. Development: The platform is implemented and programmed and all features and functions defined in the previous step are developed. This includes registering students, teachers and administrators, developing the user interface and back-end platform and implementing various functions such as registering for courses, uploading educational materials, viewing educational videos, and conducting tests and other assessments.

4. Verification and testing: The platform is tested and verified that it is working properly according to the specified requirements. This includes user interface testing, various platform functions, compatibility testing and security testing.

5. Installation and deployment: After successfully passing the testing phase, the platform is installed and deployed to users. The operational environment is configured and the platform is installed on the hosting servers.

6. Operation and maintenance: After the platform is deployed, it is operated, providing technical support and managing ongoing maintenance. The performance of the platform is monitored, improved and updated when needed.

It should be noted that there are many different software development process models that can be used in developing an e-learning platform, such as Agile, Scrum, Iterative, and others. The choice of model depends on the project requirements, implementation conditions, and the preferences of the developing team. Therefore, the waterfall model can be chosen if the requirements are stable, well known, and do not require major modifications during the development process.

2. Software Requirement Specification



Overall Description (Product perspective)

The overall description of the e-learning platform is that it is designed to provide online educational services to school students. It serves as a comprehensive platform where users can access course materials, educational videos, and participate in various interactive activities.

From a product perspective, the platform allows users to log in and gain comprehensive access to its features. This includes the ability to download course materials, view educational videos, and subscribe to specific courses. Users can interact with the platform by registering for courses, deleting courses, studying video or PDF lessons, taking tests, and participating in online assessments.

Administrators have access to additional functionalities, such as generating reports to assess student performance within enrolled courses. The system maintains detailed records of user progress and course performance, including information about registered courses and examination dates, which facilitates effective course management.

Instructors play a crucial role in the platform as they can record courses, organize content into sections, and create multiple lessons within each section. Each lesson typically consists of educational videos and accompanying PDF documents. After completing a lesson, students are required to take a quiz to assess their comprehension of the lesson content. This structured approach ensures a systematic and comprehensive presentation of educational materials, integrating multimedia elements with assessments to enrich the learning experience.

Upon completion of tests, the platform calculates and displays results to users while notifying administrators of result updates. Administrators can then update results and proficiency levels and recognize outstanding achievements with awards and rewards.

The platform also emphasizes user engagement by providing features such as forums and discussions where registered users can actively contribute, view posts from peers, and contact administrators with inquiries. Furthermore, exceptional performance in exams can lead to discounts on upcoming courses, providing an incentive for users to excel.

To ensure content security and integrity, measures are implemented to protect videos from unauthorized downloading or recording. The platform also includes safeguards to prevent



users from registering the same account on multiple devices, enhancing the overall integrity of the e-learning platform.

Overall, the e-learning platform aims to provide a comprehensive, interactive, and secure environment for online education, benefiting both students and administrators.

Product perspective

Product functions

1. User Registration: Users can create accounts and register on the platform to access its features and educational services.
2. Course Registration: Users can browse and select courses they want to enroll in. They can register for these courses to gain access to the course materials and content.
3. Course Deletion: Users have the ability to delete courses from their enrolled courses list if they no longer wish to participate in those courses.
4. Access to Course Materials: Upon logging in and enrolling in courses, users can download course materials such as PDF documents and view educational videos related to the courses they are registered for.
5. Video Lessons: Users can watch educational videos provided within the platform as part of the course content.
6. PDF Lessons: Users can access and study PDF lesson materials that are part of the course content.
7. Tests and Assessments: Users can participate in online tests and assessments to evaluate their understanding and comprehension of the course content.
8. Reports Generation: Administrators can generate reports that assess student performance within enrolled courses. These reports provide insights into user progress and course performance.



9. Course Management: The platform maintains detailed records of user progress, course enrollment, and examination dates. This facilitates effective course management for both users and administrators.
10. Lesson Organization: Instructors can record courses and organize content into sections. Each section contains multiple lessons, which may include educational videos and PDF documents.
11. Quizzes: After completing each lesson, students are required to take quizzes that assess their comprehension of the lesson content. This ensures a systematic and comprehensive presentation of educational materials.
12. Results Display: After completing tests, the platform calculates and displays results to users, providing them with feedback on their performance.
13. Awards and Rewards: Administrators can recognize outstanding achievements with awards and rewards, motivating and incentivizing users to excel.
14. User Engagement: Registered users can actively contribute to forums, participate in discussions, view posts from peers, and contact the administrator for inquiries. This promotes user engagement and collaboration within the platform.
15. Data Recording and Reports: The platform systematically records user-related data, enabling the generation of graphical reports that illustrate average user performance. These reports provide insights into user progress and performance trends.
16. Security Measures: The platform implements measures to protect videos from unauthorized downloading or recording, ensuring the security and integrity of the educational content. Safeguards are also in place to prevent users from registering the same account on multiple devices, enhancing the overall integrity of the platform.

User characteristics

1. School Students: The primary target audience of the e-learning platform is school students. These users are typically enrolled in educational institutions and are seeking online educational services to supplement their learning.

2. Registered Users: Users of the platform are required to create accounts and register to access its features. They have the motivation and willingness to engage in online learning and take advantage of the educational resources provided by the platform.

3. Administrators: Administrators are individuals responsible for managing and overseeing the operation of the e-learning platform. They have elevated privileges within the system, such as generating reports, monitoring user performance, and updating results and proficiency levels.

4. Instructors: Instructors are educators or subject matter experts who create and deliver educational content on the platform. They have the ability to record courses, organize content, and create assessments. They play a vital role in designing the learning experience and ensuring the quality of educational materials.

5. Engaged Learners: Registered users who actively contribute to forums, participate in discussions, and view posts from peers demonstrate a high level of engagement with the platform. They are motivated to interact with other learners and seek opportunities for collaborative learning and knowledge sharing.

6. Self-directed Learners: The e-learning platform caters to users who are capable of managing their own learning experience. They can independently navigate the platform, register for courses, study lessons, and take assessments. They are motivated to take responsibility for their learning progress.

7. Performance-oriented Users: Users of the platform are interested in monitoring their performance and progress. They are motivated to take tests and assessments, receive feedback on their achievements, and strive for outstanding results. They appreciate recognition in the form of awards and rewards for their exceptional performance.

8. Security-conscious Users: Users of the platform value the security and integrity of the educational materials. They expect measures to be in place



to protect the content from unauthorized downloading or recording. They also appreciate safeguards that prevent account misuse, such as registering the same account on multiple devices.

General Constraints

1. Technical Constraints: The platform must be accessible on various devices and operating systems to accommodate different user preferences. It should also have a stable and reliable internet connection to ensure uninterrupted access to educational resources.
2. Content Constraints: The platform should provide a diverse range of educational content that aligns with the curriculum and learning objectives of school students. The content should be accurate, up-to-date, and engaging to facilitate effective learning.
3. Time Constraints: The platform should allow users to access educational materials at their convenience, enabling flexible learning schedules. It should also provide timely feedback on assessments and performance to support continuous improvement.
4. Privacy Constraints: The platform must adhere to data protection regulations and ensure the privacy of user information. It should have robust security measures in place to prevent unauthorized access or data breaches.
5. Usability Constraints: The platform should have an intuitive user interface that is easy to navigate, even for users with limited technical skills. It should also provide clear instructions and guidance on how to use its features effectively.
6. Scalability Constraints: The platform should be able to handle a large number of users simultaneously without compromising performance or accessibility. It should be scalable enough to accommodate potential growth in user base over time.
7. Cost Constraints: The platform's pricing structure should be affordable for both individual users and educational institutions, ensuring accessibility for all interested learners.

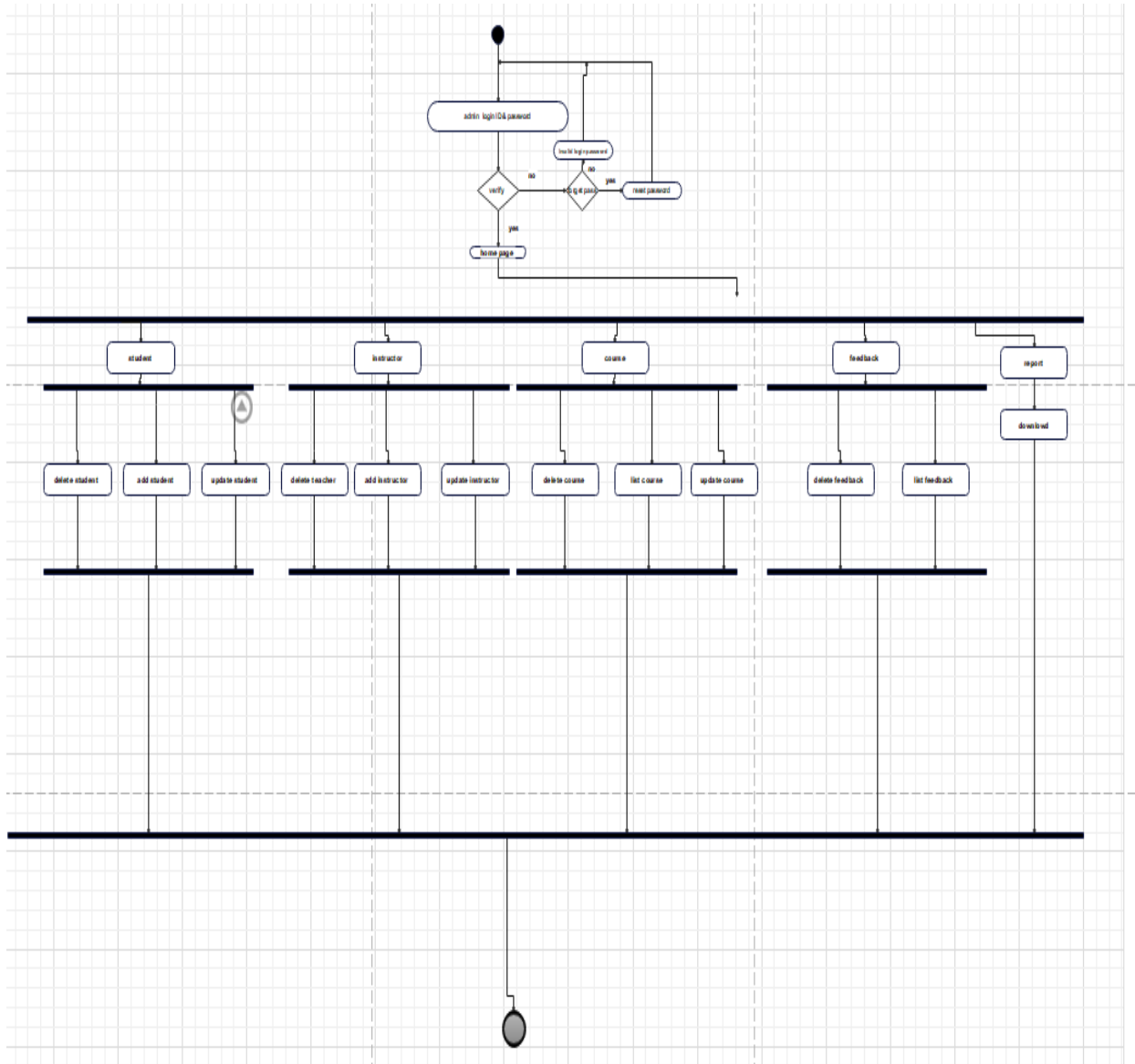
Assumptions and Dependencies



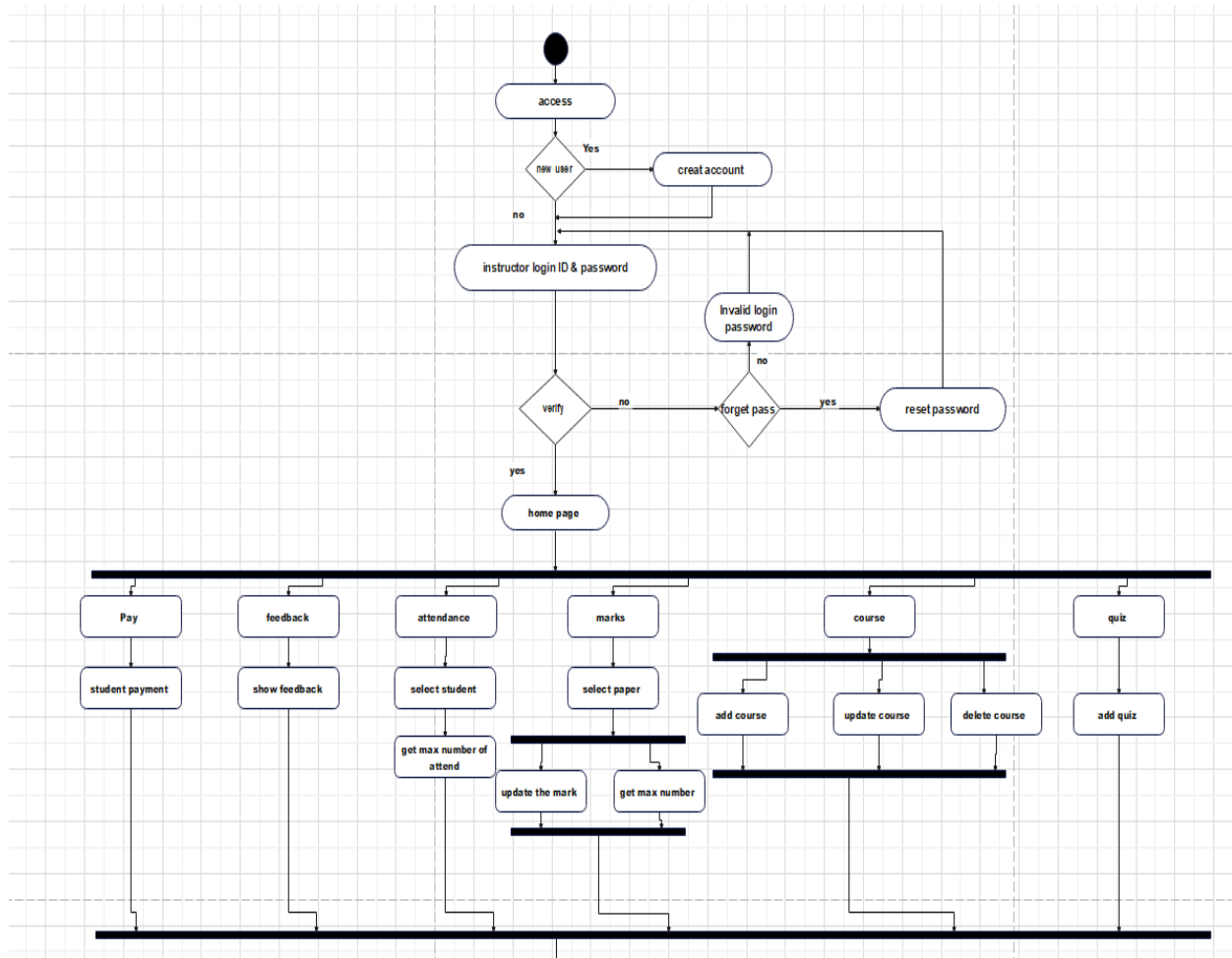
1. Assumption: The e-learning platform assumes that users have access to a reliable internet connection and necessary devices (such as computers or smartphones) to access the platform.
2. Assumption: The platform assumes that users have basic computer literacy skills and are familiar with using online platforms for learning purposes.
3. Dependency: The success of the e-learning platform depends on the availability and quality of educational content provided by instructors. Without engaging and informative content, users may not find value in using the platform.
4. Dependency: The platform relies on administrators to manage user accounts, monitor performance, and update results. Without effective administration, the platform may not function properly or provide accurate information.
5. Dependency: The engagement level of learners depends on their motivation and willingness to actively participate in discussions and forums. If users are not motivated or interested in collaborative learning, the engagement level may be low.
6. Dependency: The security measures implemented by the platform are crucial for protecting educational materials and preventing unauthorized access or misuse. Without proper security measures, user trust may be compromised.
7. Dependency: The success of the e-learning platform also depends on external factors such as government regulations, technological advancements, and market demand for online education. Changes in these factors can impact the viability and sustainability of the platform.

4.Activity Diagram

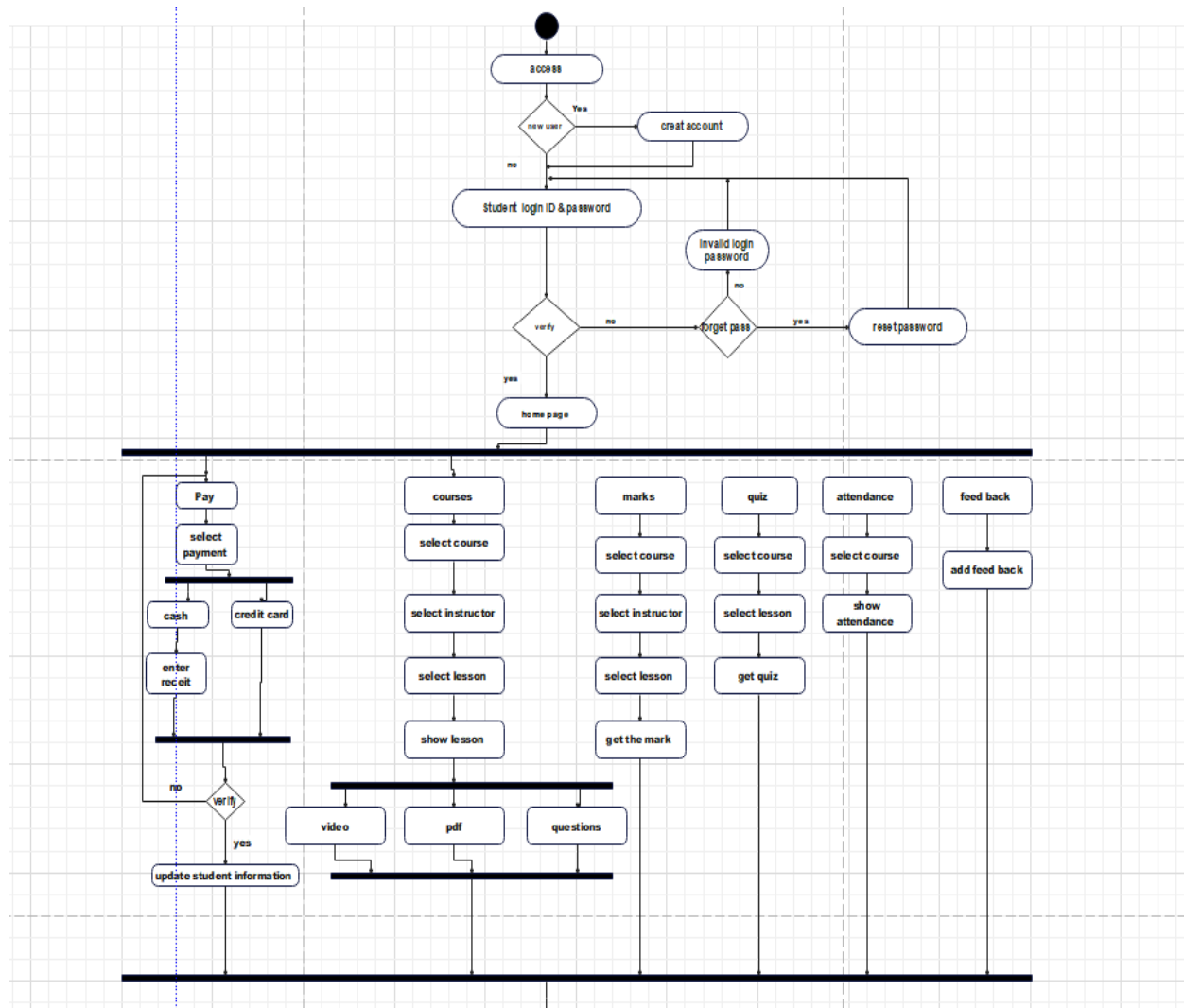
1)Admin



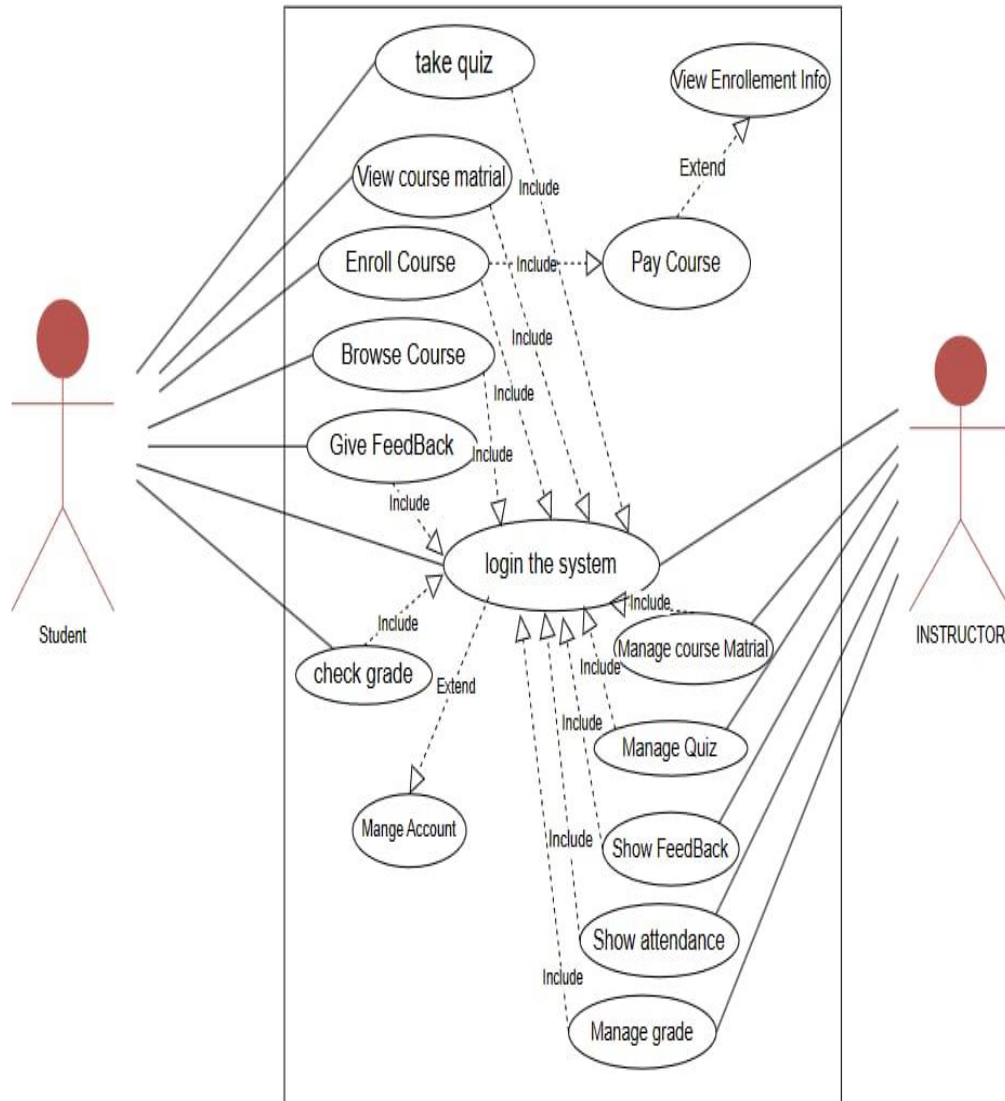
2)Instructor



3)Student

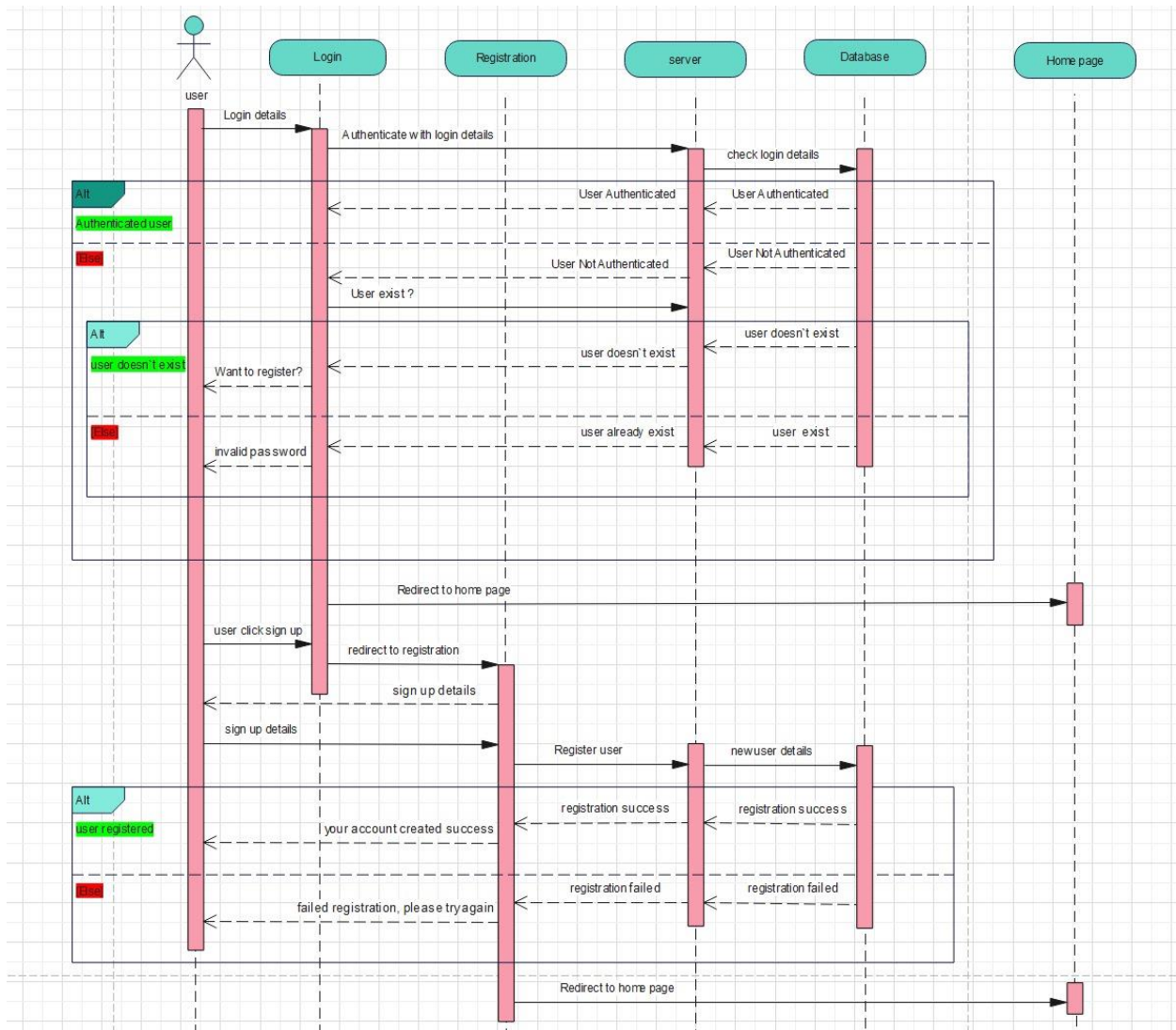


5. Use Case Diagram

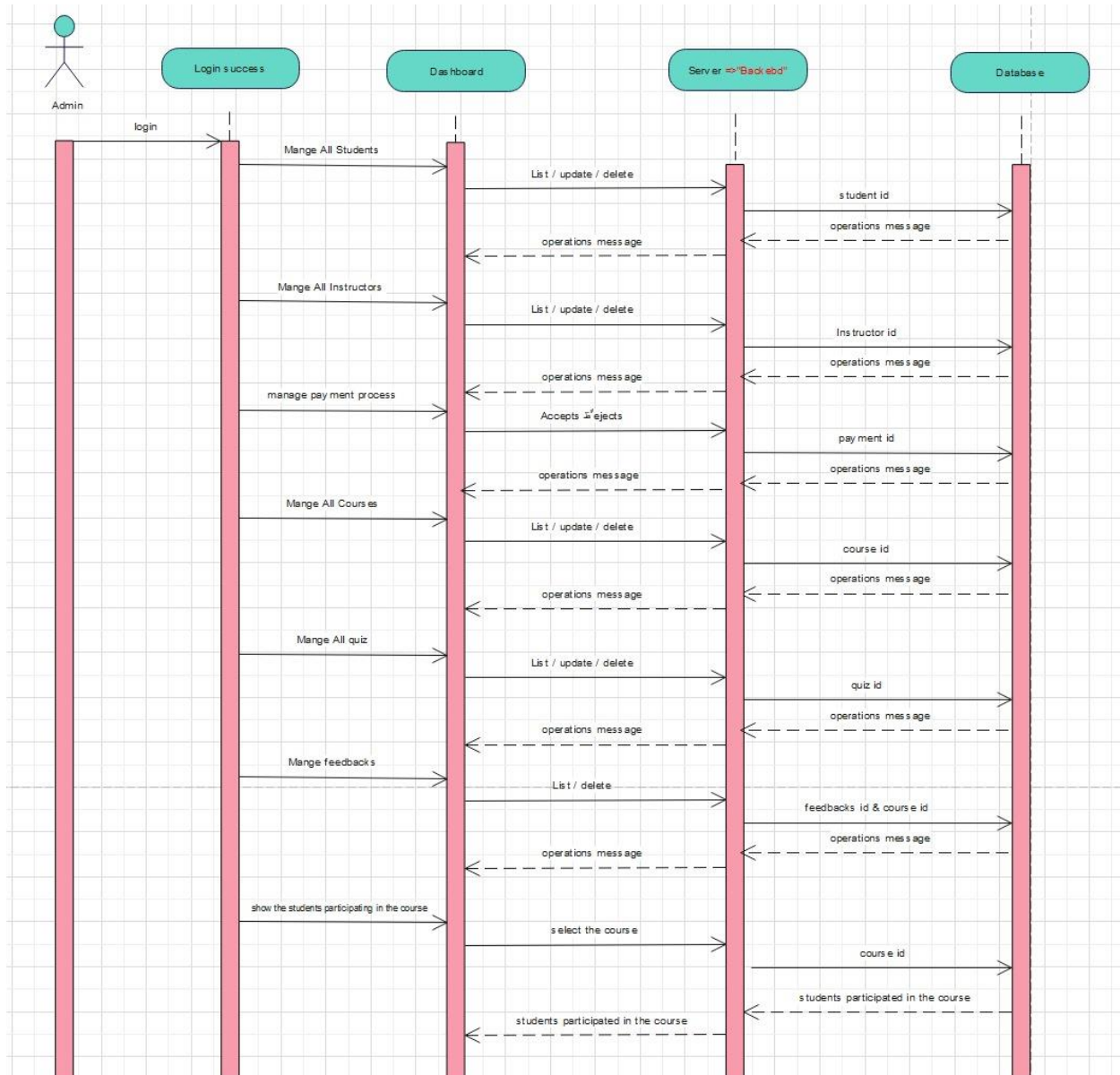


6.Sequence Diagram

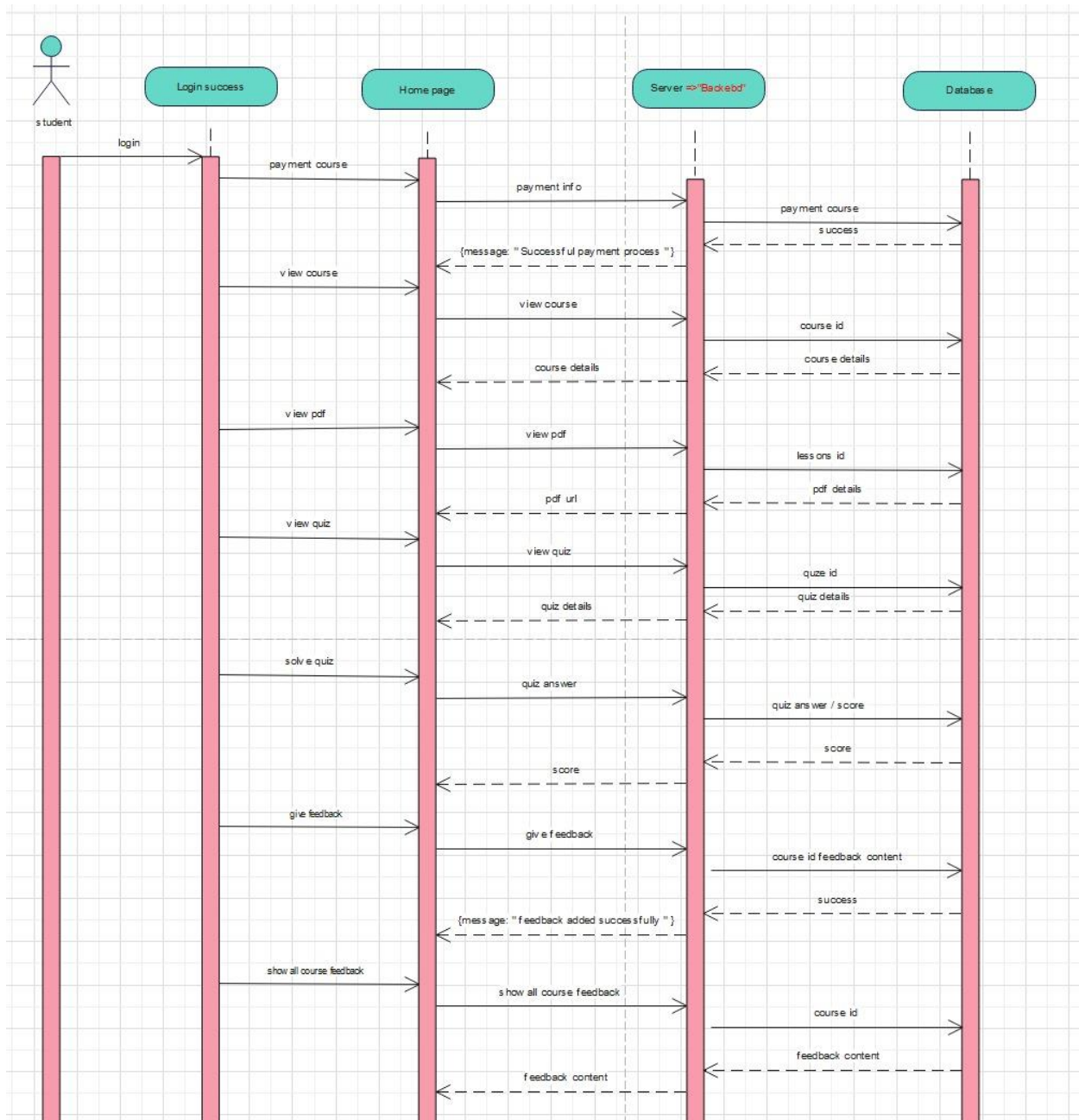
1)Login



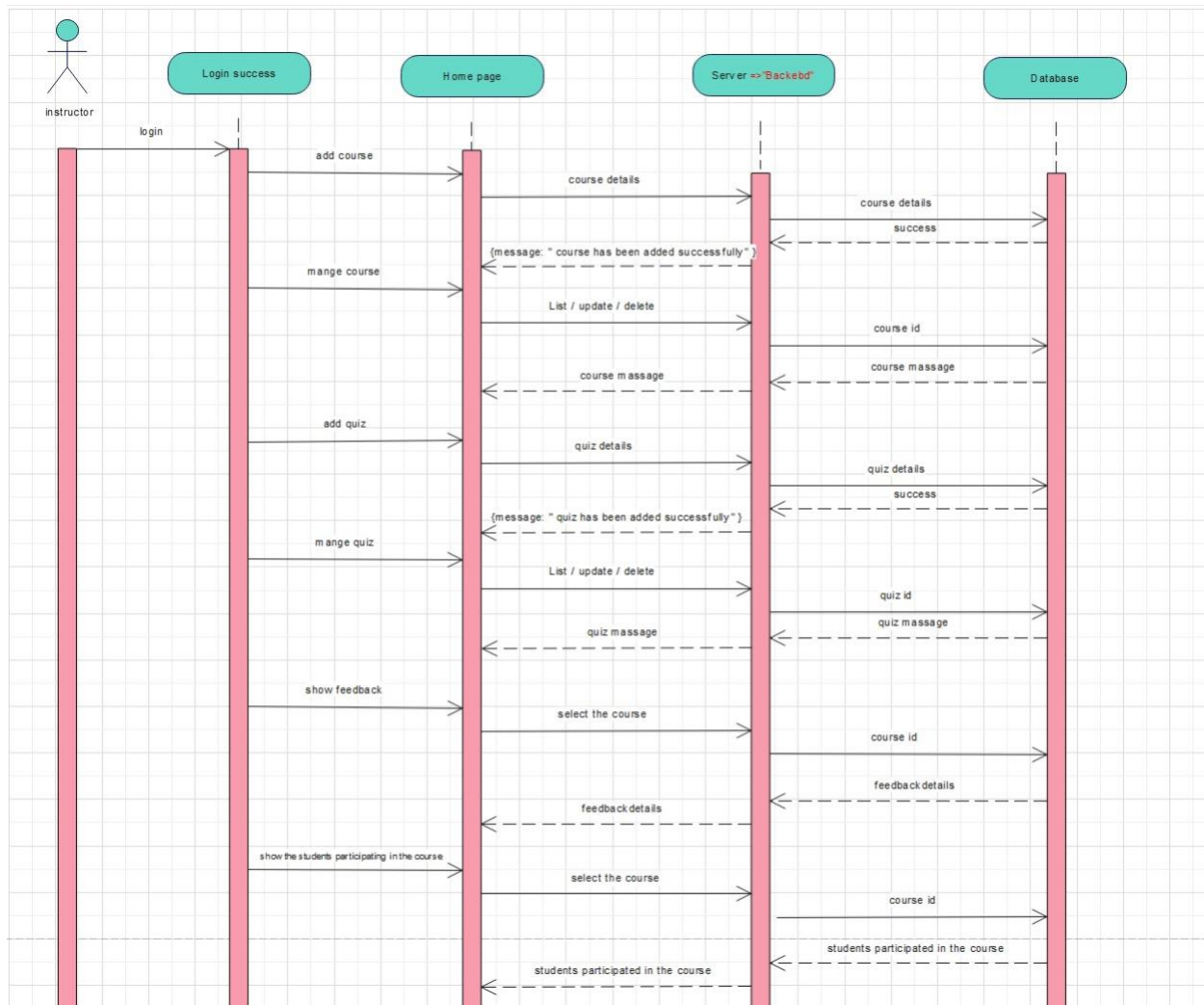
2)Admin



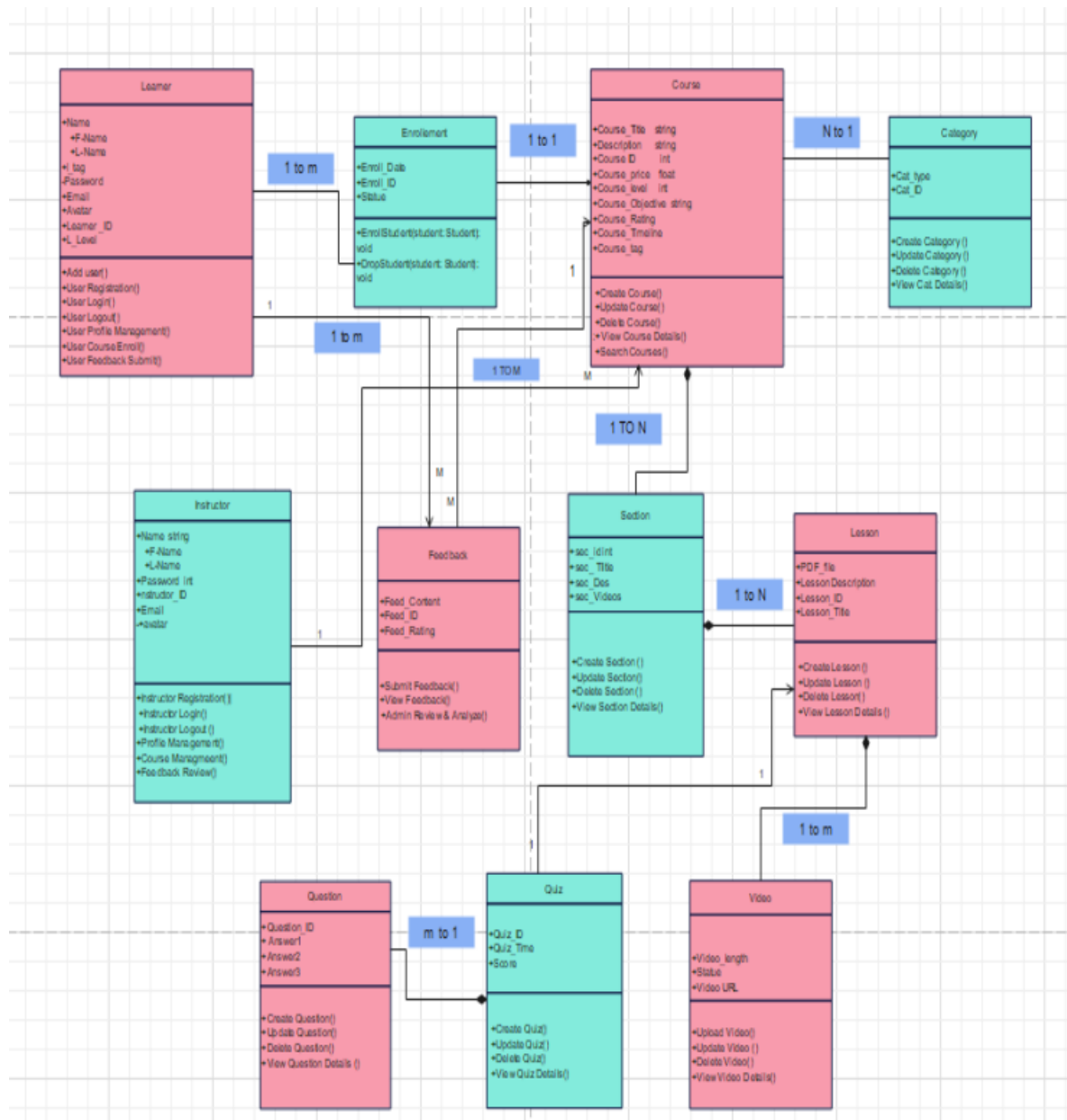
3)Student



4)Instructor



7. Class Diagram





University of Sadat City
Faculty Of Computers and Artificial Intelligence



Best Wishes