

CHAPTER#1

a) Responsibility Matrix:

Electronic Learning System				
Name	Project Management and Requirement Analysis	Use Case Modeling	Data Modeling	Process Modeling
Berkay Şengel	✓			
Enes Olgun		✓		
Huzeyfe Bahadır Arslan			✓	
Batuhan Özcan				✓

b) Project Definition:

E-learning is defined as being able to access learning materials online through various electronic devices. There is a wide variety of electronic learning materials such as presentations, online courses and videos. Users can determine the learning speed and learning style that suits them. That's why electronic learning creates a flexible learning environment.

c) Project Purpose:

This project aims to enrich electronic learning materials and increase the interactiveness and efficiency of education with simultaneous virtual lessons which in conclusion, creates an innovative e-learning system.

d) Project Scope:

- 1) Goal: To create an optimum learning environment for users.
- 2) Deliverable: Electronic learning system (iLearn – Innovative Learning)
- 3) Task: Building an e-learning system that can be used by individuals, universities and other educational institutions.
- 4) Costs (monthly): \$50.000
- 5) Deadline: June 12, 2022 Sunday.

e) Project Constraints:

- 1) Schedule: This system must be finished by June 12, 2022 Sunday.
- 2) Policy: A currency-specific, economical pricing policy will be applied for each country. In addition, a discount policy will be applied for contracted whole membership purchases (entire memberships for students of universities or for employees of companies, etc.).
- 3) Resources: Project team must consist of at least 20 members to deploy the project on time.
- 4) Technology: This system must be enabled as both website and mobile application.
- 5) Cost: This system cannot cost more than \$650.000 annually.

f) Actor Glossary:

- 1) Administrator.
- 2) Instructor.
- 3) Student.
- 4) System.

g) Non-functional requirements:

- 1) Security: This system requires a user account and password to administer the system, and students and instructors cannot access other users.
- 2) Error handling: If an internet cutoff occurs during an online exam, students will be able to continue from where they left in case of reconnection.
- 3) Economic: By lowering the amount of hard copy materials used, this system lowers costs and increases profits.
- 4) Efficiency: Delays in the navigation between questions during the exam will not affect the total time given to the student in the exam.

h) Functional Requirements:

- 1) Upload/Download resources: The students shall download learning materials which are uploaded by the instructors.
- 2) Add department/course: The instructors shall add department and courses to the system.
- 3) Prepare/take exams: The instructors can prepare exams for students to take.
- 4) Display personal report: Each student can view their progress in their classes through the system.
- 5) Confirm instructors: The administrator can select the instructors who will teach on the system.

CHAPTER#2

a) User stories:

- 1-)As a student, I want to download resources my instructors upload so that I can reach them even when I don't have internet connection.
- 2-)In order to group students as an instructor, I can add department and related courses.
- 3-)As an instructor, I want to prepare exams for my students so that I can grade them in cases of emergency.
- 4-)As a student, I want to display my personal report so that I can see the subjects that I lack and study according to that.
- 5-)As an administrator, I want to confirm the instructors that will teach on the system so that only the capable ones will be accepted.

b) Scenarios:

1-)

Use case name:	Download resources
Use case description:	The user opens the system login window. After selecting the membership type from the membership type section, the student enters the assigned user name and password in the relevant blank. The student who logs into the system can access all the courses assigned to him. After selecting the relevant course on the system, it displays the resources part of that course. In the resources section, there are all the materials uploaded by the instructor about the course. The student selects the material he/she wants to download and clicks the "download" button in the upper right corner of the selected course material. When the student clicks this button once, he/she downloads the relevant material of the course. As a result of this download, the student becomes able to access the downloaded material even without an internet connection.
Primary actor(s):	Student
Supporting actor(s):	Instructor, System
Triggers	The student wants to download materials that he/she has selected and clicks the download button.
Preconditions	The student must be a registered user. The student must be registered to the course that he/she wants to download materials from. The material must be uploaded by the instructor beforehand. The student has selected the materials to be downloaded.
Postconditions	The download will begin in the students system. Downloaded material is reachable in students system without internet connection.

Normal Flow	1-) The student opens the login window. 2-) The authentication system requests username, password and membership type. 3-) Student enters his/her username, password and membership. 4-) Authentication system confirms the student 5-) The student selects the course and displays the resources part. 6-) The student chooses the materials to be downloaded. 7-) The student clicks the download button. 8-) The download begins. 9-) The requested file is now present in students system.
Alternate Flows	1-) (Alt-step 2) If the student does not have an account, he/she can create an account or exit. 2-) (Alt-step 4) If the student enters wrong inputs, an error message is shown and the student is asked to re-enter the inputs. 3-) (Alt-step 5) If the student cannot view the course he/she sends a request to the related instructor. 4-) (Alt-step 8) If the download process does not begin in five seconds, student can press the backup download link manually to start the process.
Business Rules	- The student must be a registered user to access the system. - The student must be enrolled in the course from which he or she wishes to download resources. - The student must have secure internet connection to start downloading.

2-)

Use case name:	Add course
Use case description:	The instructor opens the system login window. After selecting the membership type from the membership type section, the instructor enters the assigned user name and password in the relevant blank. The instructor who logs into the system has some special authorities in order to ensure that the course runs through the system. One of these authorities, which is specifically assigned to instructors, is to add courses. The instructor clicks on the "add course" button in the middle left corner of the screen to add the course of the relevant department(s) to the system. Then writes the name of the course in the window that opens. Makes the relevant course viewable by students by setting the authorization required for viewing the course. Then, clicking the "ok" button adds the relevant course to the system.
Primary actor(s):	Instructor
Supporting actor(s):	System
Triggers	The instructor clicks the "add course" button and enters course details.
Preconditions	The instructor must be confirmed by the administrator. Course to be added must be permitted by students department.
Postconditions	Added course will be visible by related departments student. Added course can be edited by the instructor.

Normal Flow	1-) The instructor opens the login window. 2-) The authentication system requests username, password and membership type. 3-) Instructor enters his/her username, password and membership. 4-) Authentication system confirms the instructor. 5-) The instructor clicks the "add course" button. 6-) The instructor writes the name of the course. 7-) The instructor sets the privacy of the course. 8-) The instructor clicks the "ok" button. 9-) The system indicates that the course is added.
Alternate Flows	1-) (Alt-step 2) If the instructor does not have an account, he/she can create an account or exit. 2-) (Alt-step 4) If the instructor enters wrong inputs, an error message is shown and the instructor is asked to re-enter the inputs. 3-) (Alt-step 8) If the added course does not match with any of the departments, the instructor is asked to re-enter the information required.
Business Rules	- The instructor must be confirmed by the administrator. - The course must match with at least one of the departments to be added.

3-)

Use case name:	Take exams
Use case description:	The student opens the system login window. After selecting the membership type from the membership type section, the student enters the assigned user name and password in the relevant blank. The student logging into the system has the authority to view all the exams to be made regarding the courses assigned to him/her. The student chooses the relevant course to take the exam and clicks on the exams folder from the resources section of the course. He/she selects the relevant exam from the exams folder and clicks the "start exam" button after reading the regulations and details set by his/her teacher about the exam. After the exam starts, he/she must answer the questions in the exam within a certain time. Student answers the questions in accordance with the question type and proceeds to the next question by clicking the "next" button. If the instructor of the relevant course has not imposed any restrictions for the exam, the student can navigate between questions during the exam. After completing all the questions in the exam, the student clicks on the "submit exam" button and the exam process is completed.
Primary actor(s):	Student
Supporting actor(s):	Instructor, System
Triggers	The student clicks the "start exam" button.
Preconditions	The student must be a registered user. The student must be registered to the course in order to take the exam. The exam must be uploaded by the instructor beforehand. In order to start the exam, the deadline must not be exceeded.

Postconditions	<p>The students who do not take the exam will be informed to the instructor.</p> <p>The instructor will be able to see the average of the exam calculated by the system.</p>
Normal Flow	<p>1-) The student opens the login window.</p> <p>2-) The authentication system requests username, password and membership type.</p> <p>3-) Student enters his/her username, password and membership.</p> <p>4-) Authentication system confirms the student.</p> <p>5-) The student selects the course in which exam is included.</p> <p>6-) The student clicks the "start exam" button.</p> <p>7-) In order to navigate to the next question, the student clicks the "next" button.</p> <p>8-) The student clicks on the "submit exam" button.</p>
Alternate Flows	<p>1-) (Alt-step 2) If the student does not have an account, he/she can create an account or exit.</p> <p>2-) (Alt-step 4) If the student enters wrong inputs, an error message is shown and the student is asked to re-enter the inputs.</p> <p>3-) (Alt-step 7) In case of any delay while navigating between the questions, delay time will not be decreased from the total exam time.</p> <p>4-) (Alt-step 8) If the student cannot click on the "submit exam" button within the given time interval, all of his/her answers until that time is saved and exam is submitted automatically.</p>
Business Rules	<ul style="list-style-type: none"> - The student must be a registered user to access the system. - The student must be enrolled in the course from which he or she wishes to take exam.

4-)

Use case name:	Display personal report
Use case description:	<p>The student opens the system login window. After selecting the membership type from the membership type section, the student enters the assigned user name and password in the relevant blank. There is a section in the system where students can view their progress in their courses and their grades. The student logging into the system has the authority to access this section and if the instructor of the relevant course wants to share the grades taken from the course, the course average, the questions asked in the exam along with their answers etc., the student can access these informations from this section when the exam deadline is over. In order to view this section, the student first selects the relevant course from the system and then click the "progress" tab among the top tabs. He/she clicks on the "display personal report" button on the page that opens. Thus, the student can realize where he/she made a mistake, correct the mistakes he/she made, and follow his/her own progress through the system.</p>
Primary actor(s):	Student
Supporting actor(s):	System

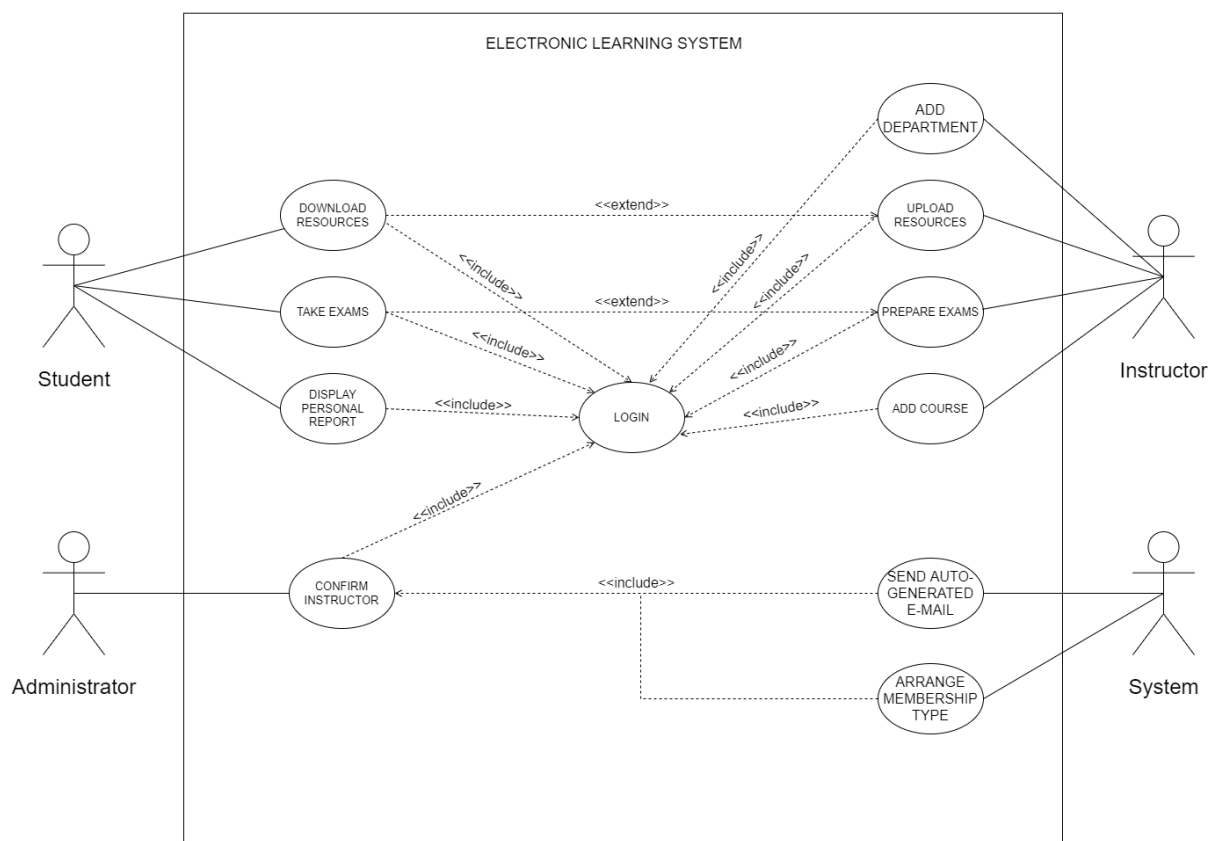
Triggers	The student clicks the "display personal report" button.
Preconditions	The student must be a registered user. The student must complete any course-related activity on the system.
Postconditions	The student will be able to see all the activities done by student in his/her personal report. The instructor will be able to see reports of the students which are registered to own course.
Normal Flow	1-) The student opens the login window. 2-) The authentication system requests username, password and membership type. 3-) Student enters his/her username, password and membership. 4-) Authentication system confirms the student. 5-) The student selects the relevant course. 6-) The student clicks "progress" tab. 7-) The student clicks "display personal report" button.
Alternate Flows	1-) (Alt-step 2) If the student does not have an account, he/she can create an account or exit. 2-) (Alt-step 4) If the student enters wrong inputs, an error message is shown and the student is asked to re-enter the inputs. 3-) (Alt-step 7) If the student is not able to display the report, a "request to view the personal report" notification is automatically sent to the related instructor.
Business Rules	- The student must be a registered user to access the system. - The student must have done at least one activity in the system to show his/her personal report.

5-)

Use case name:	Confirm instructors
Use case description:	There is a section on the system where instructors can apply and only managed by the admin. Instructors apply through this department. These applications are evaluated by the admin. Qualified instructors are informed via e-mail and their membership types in the system are changed to "Instructor".
Primary actor(s):	Administrator
Supporting actor(s):	Instructor, System
Triggers	Administrator starts to analyze incoming instructor applications.
Preconditions	There must be instructor applications to be evaluated. Applied instructors must have enough knowledge in his/her own field to be accepted.
Postconditions	Qualified instructors are accepted and notified via e-mail. Membership type of the applicant is changed to "instructor".

Normal Flow	<p>1-) The administrator opens the login window.</p> <p>2-) The authentication system requests username, password and membership type.</p> <p>3-) Administrator enters his/her username, password and membership.</p> <p>4-) Authentication system confirms the administrator.</p> <p>5-) Administrator opens the instructor applications section.</p> <p>6-) Administrator evaluates every application one by one and confirms the qualified instructors.</p> <p>7-) When administrator clicks the "confirm" button, system sends an auto-generated e-mail to notify the confirmed applicant.</p> <p>8-) Membership type of the confirmed applicant is changed to "instructor" by the system.</p>
Alternate Flows	<p>1-) (Alt-step 4) If the administrator enters wrong inputs, an error message is shown and the student is asked to re-enter the inputs.</p> <p>2-) (Alt-step 8) If the membership type of the confirmed applicant is not changed by the system automatically, administrator does this operation manually.</p>
Business Rules	<p>- Applicant must be above 18.</p> <p>- Instructors must not upload any material including violence, sexuality, racism and discrimination.</p>

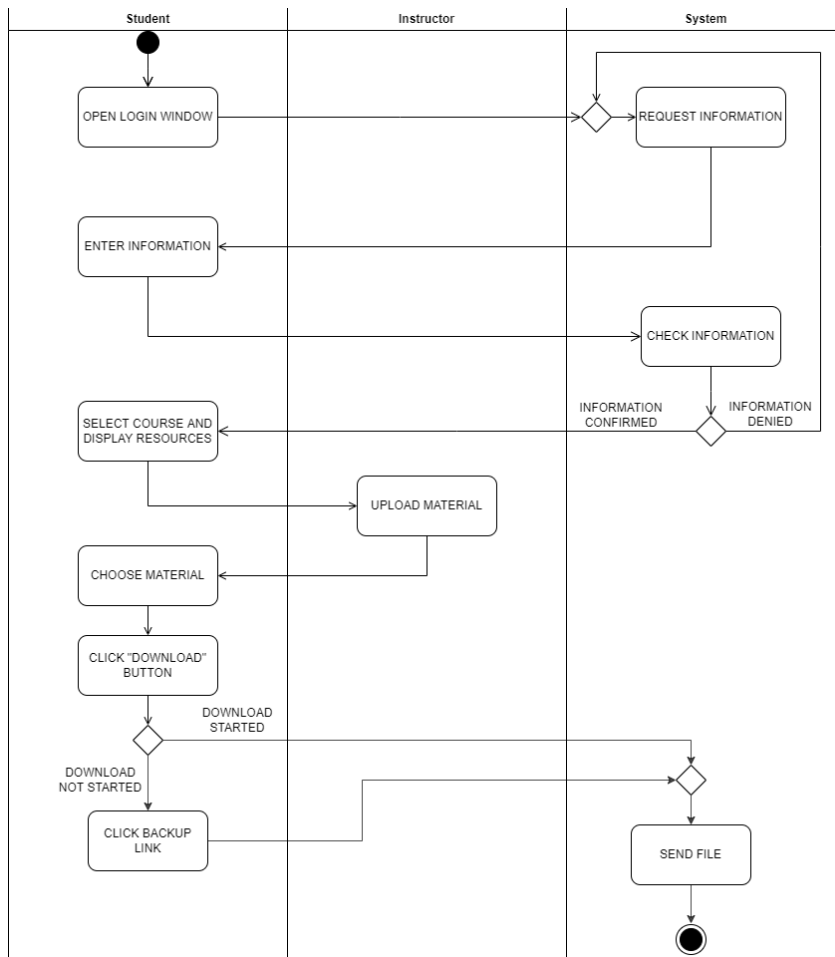
c) Use Case Diagram:



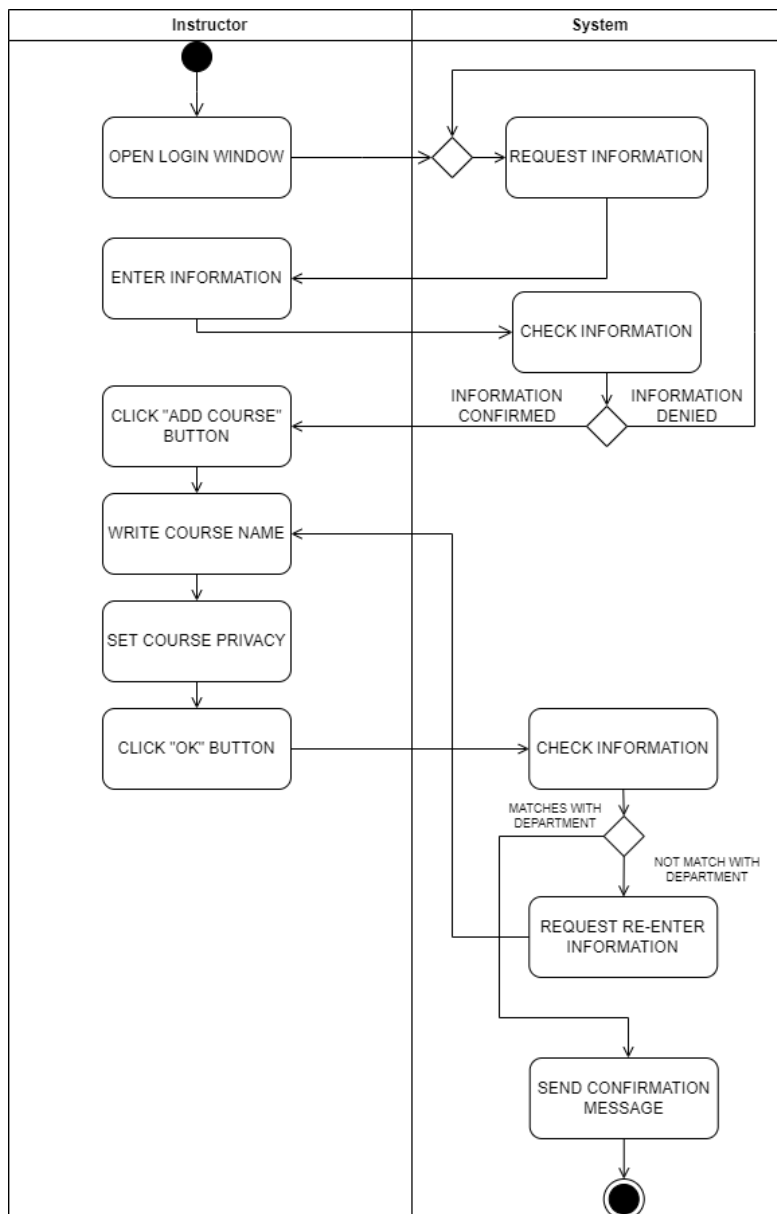
CHAPTER#3

a) Activity Diagrams:

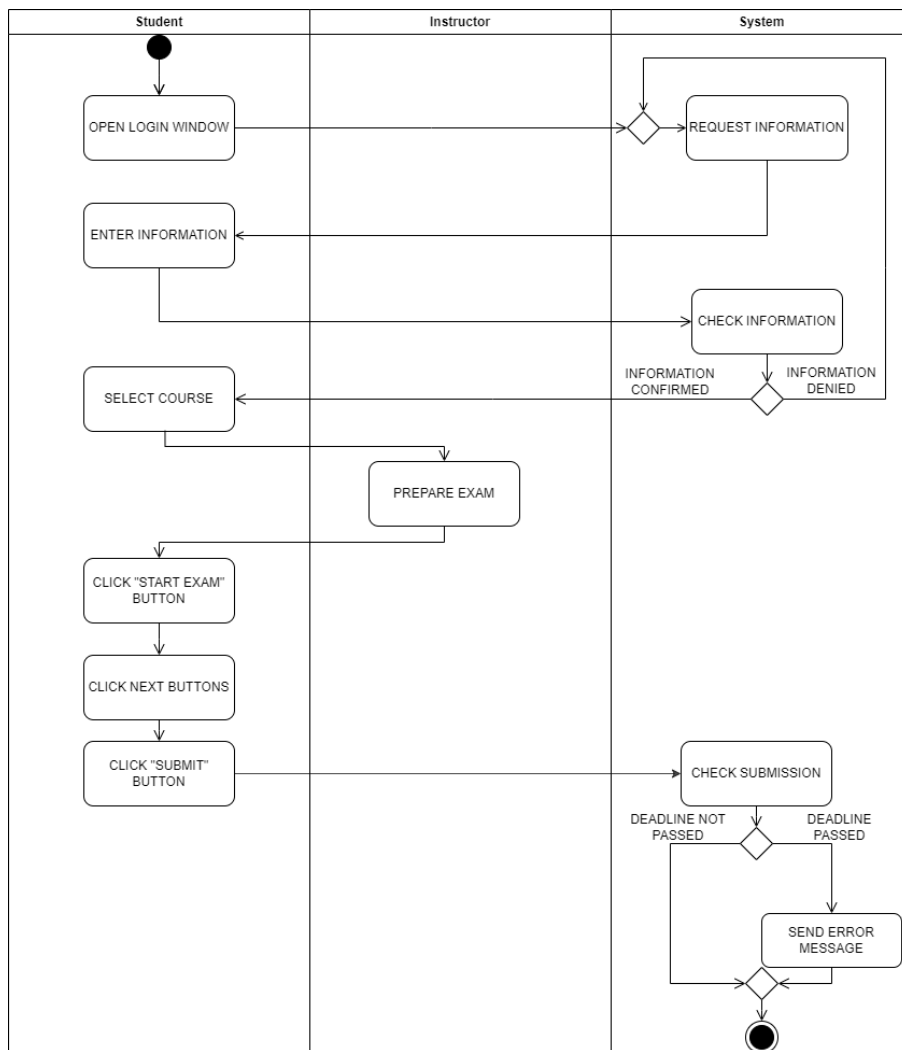
1) Download Resources:



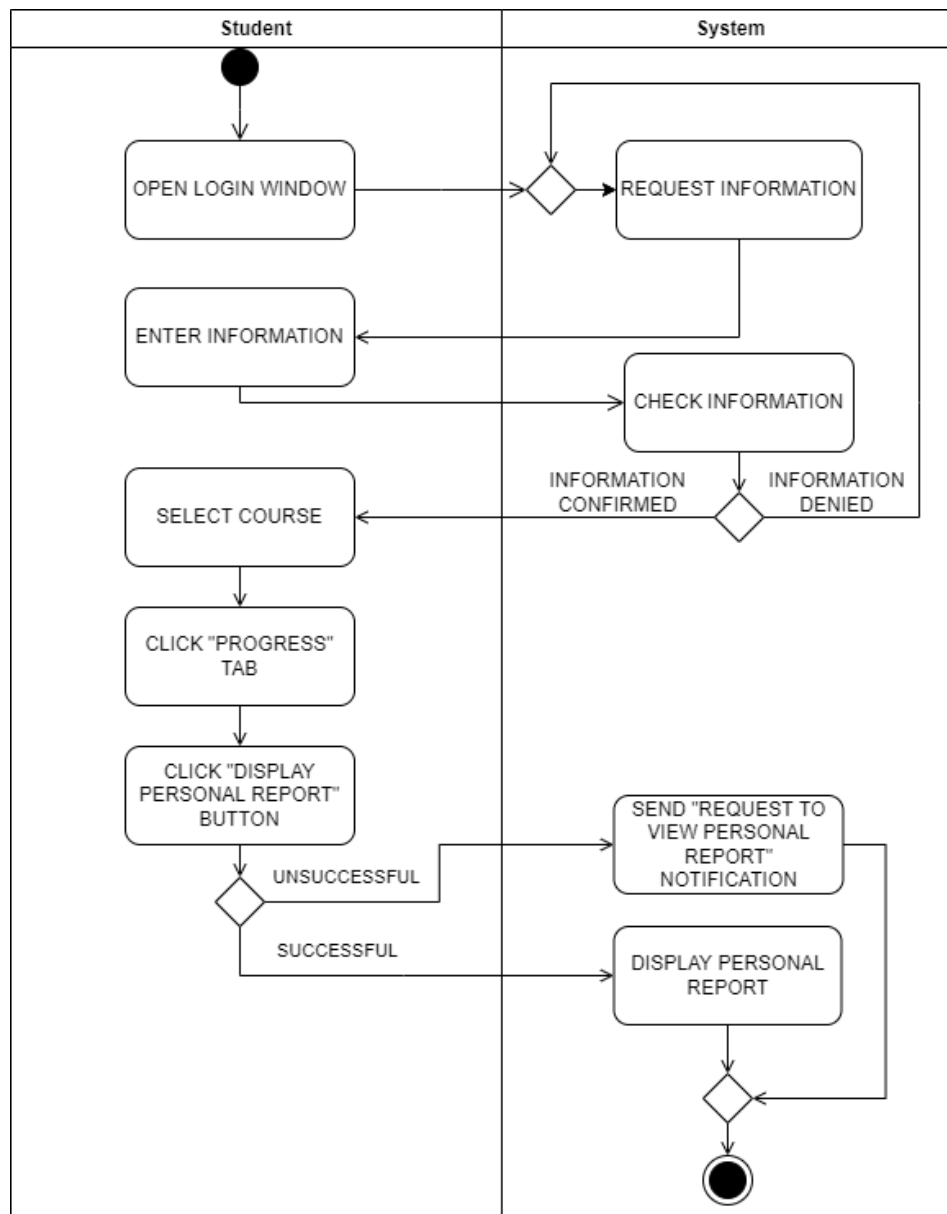
2) Add Course:



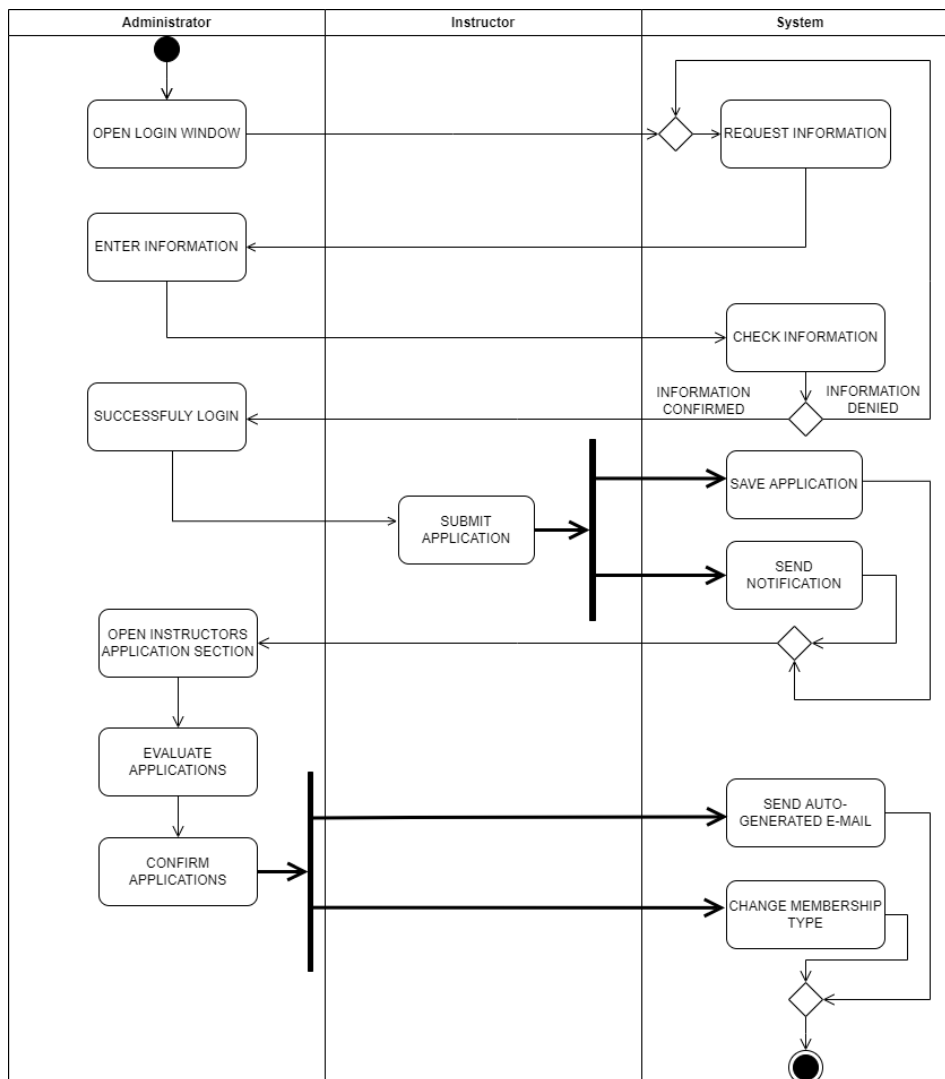
3) Take Exams:



4) Display Personal Report:

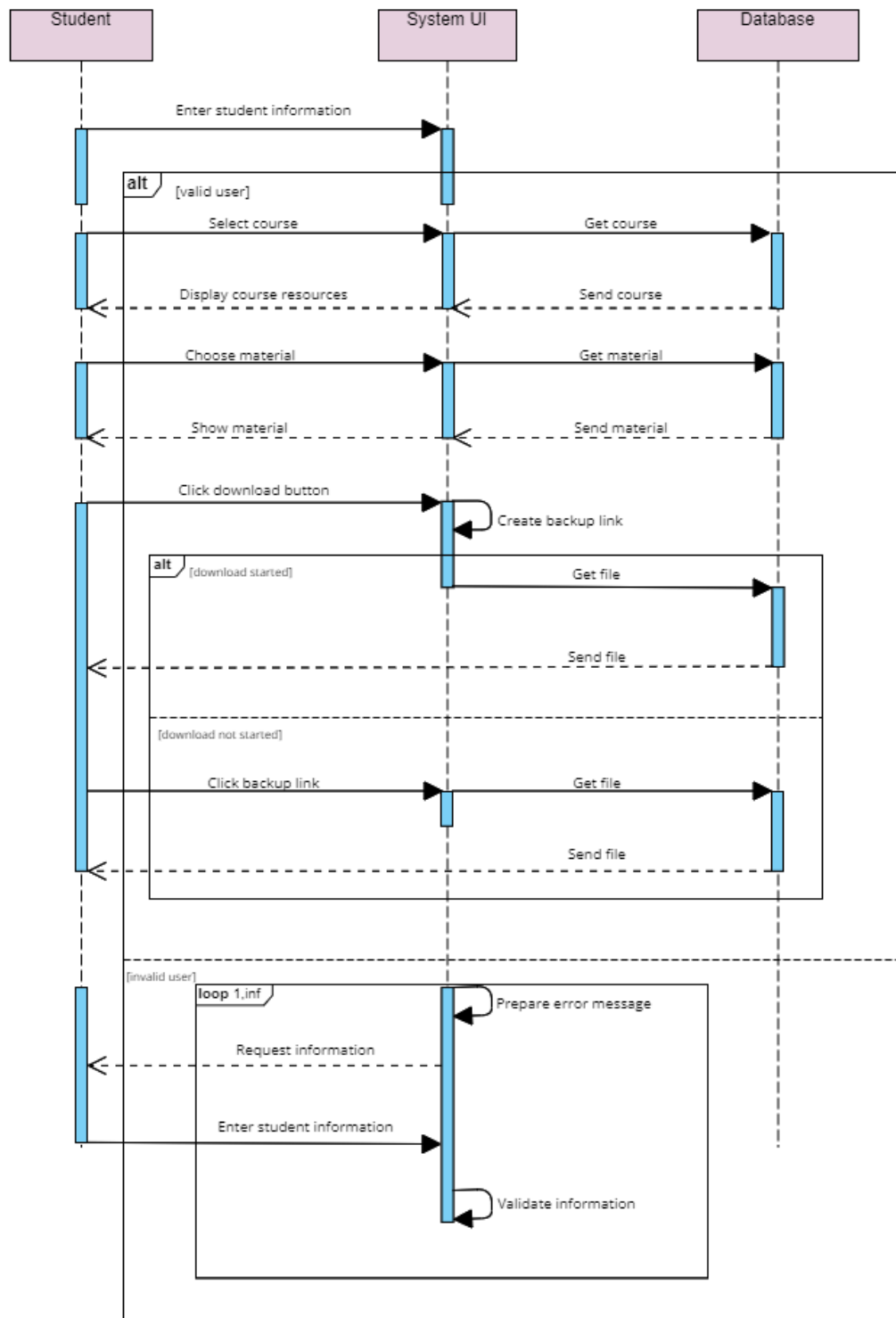


5) Confirm Instructors:

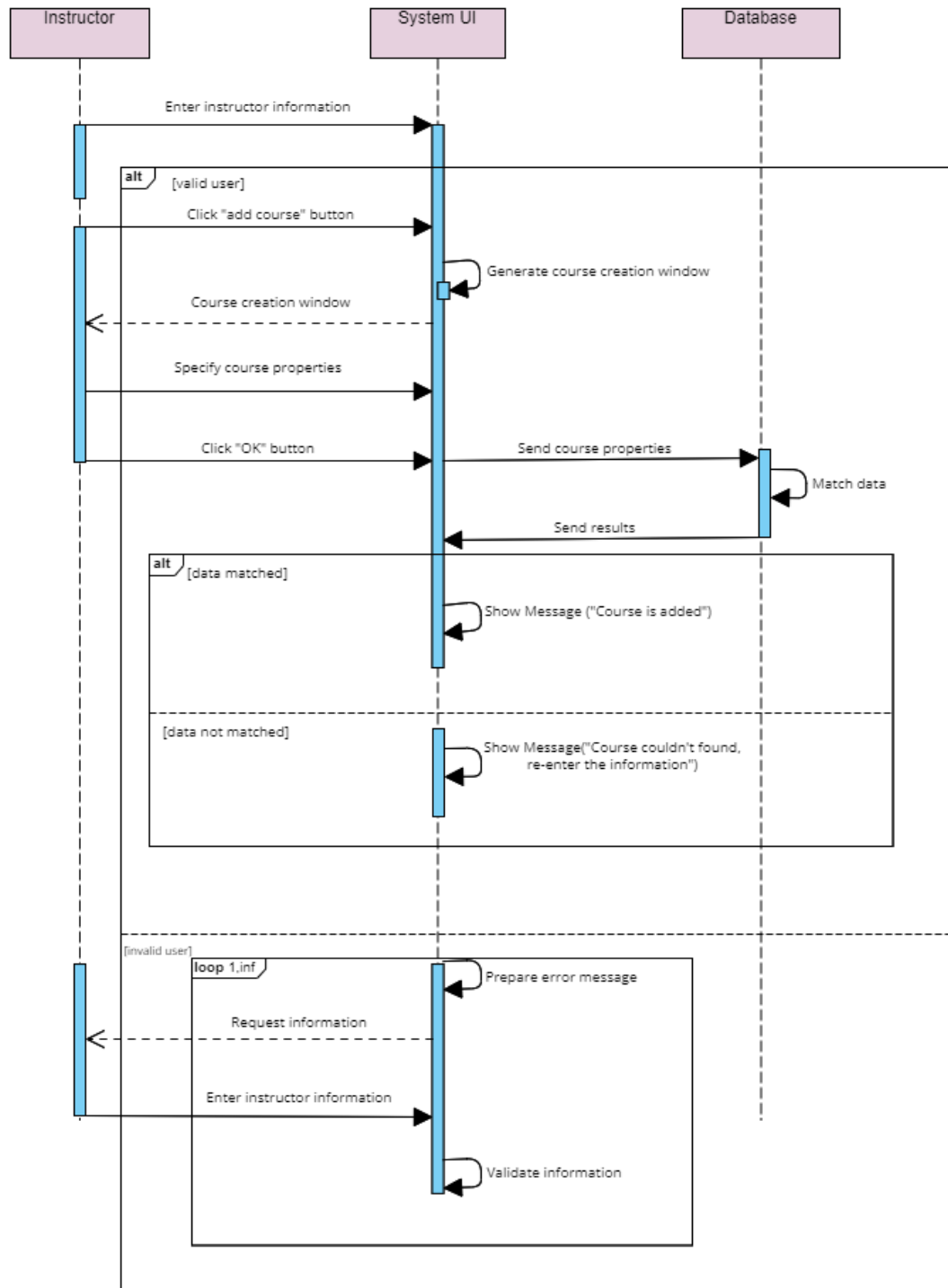


b) Sequence Diagrams:

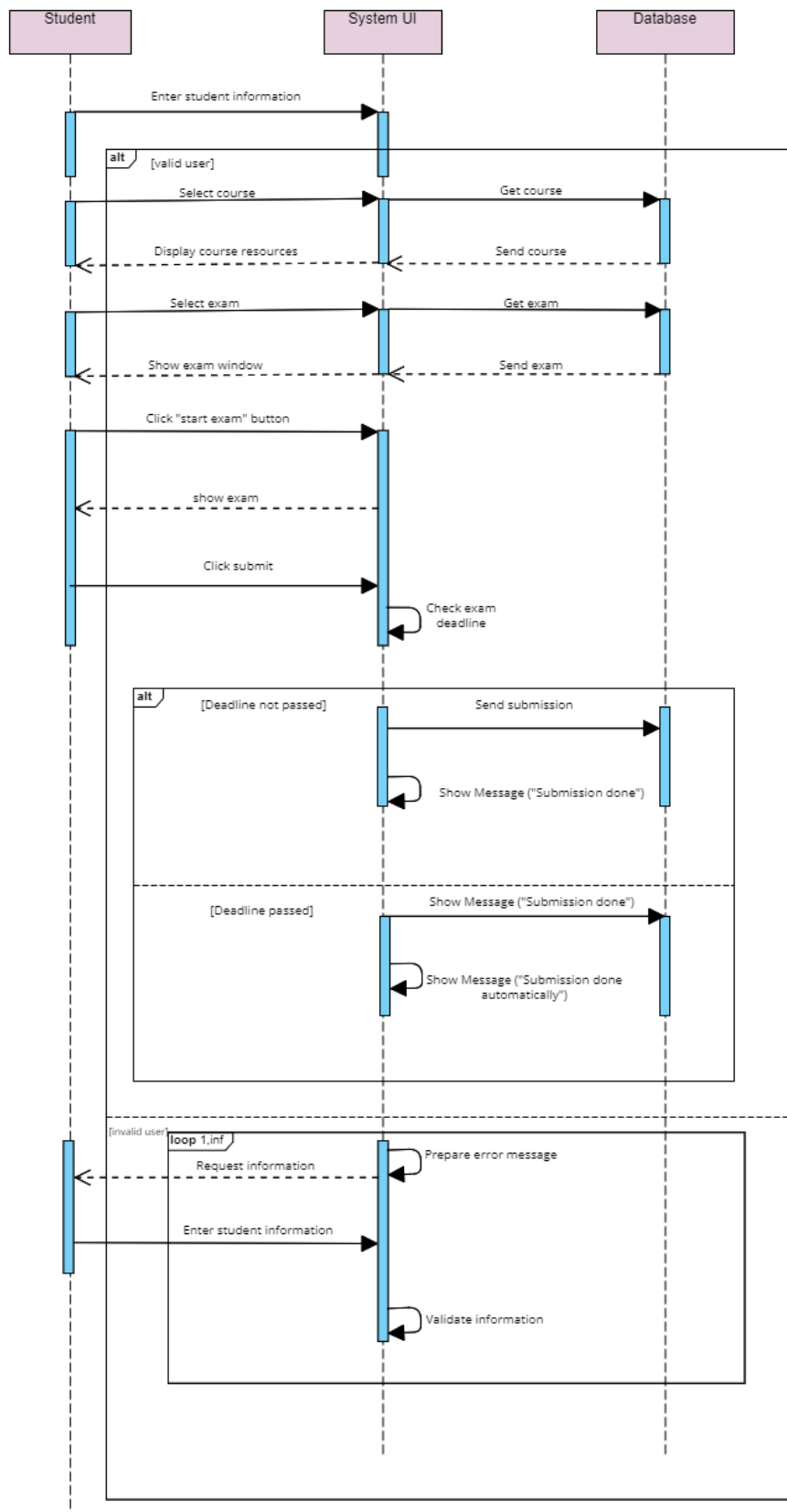
1) Download Resources:



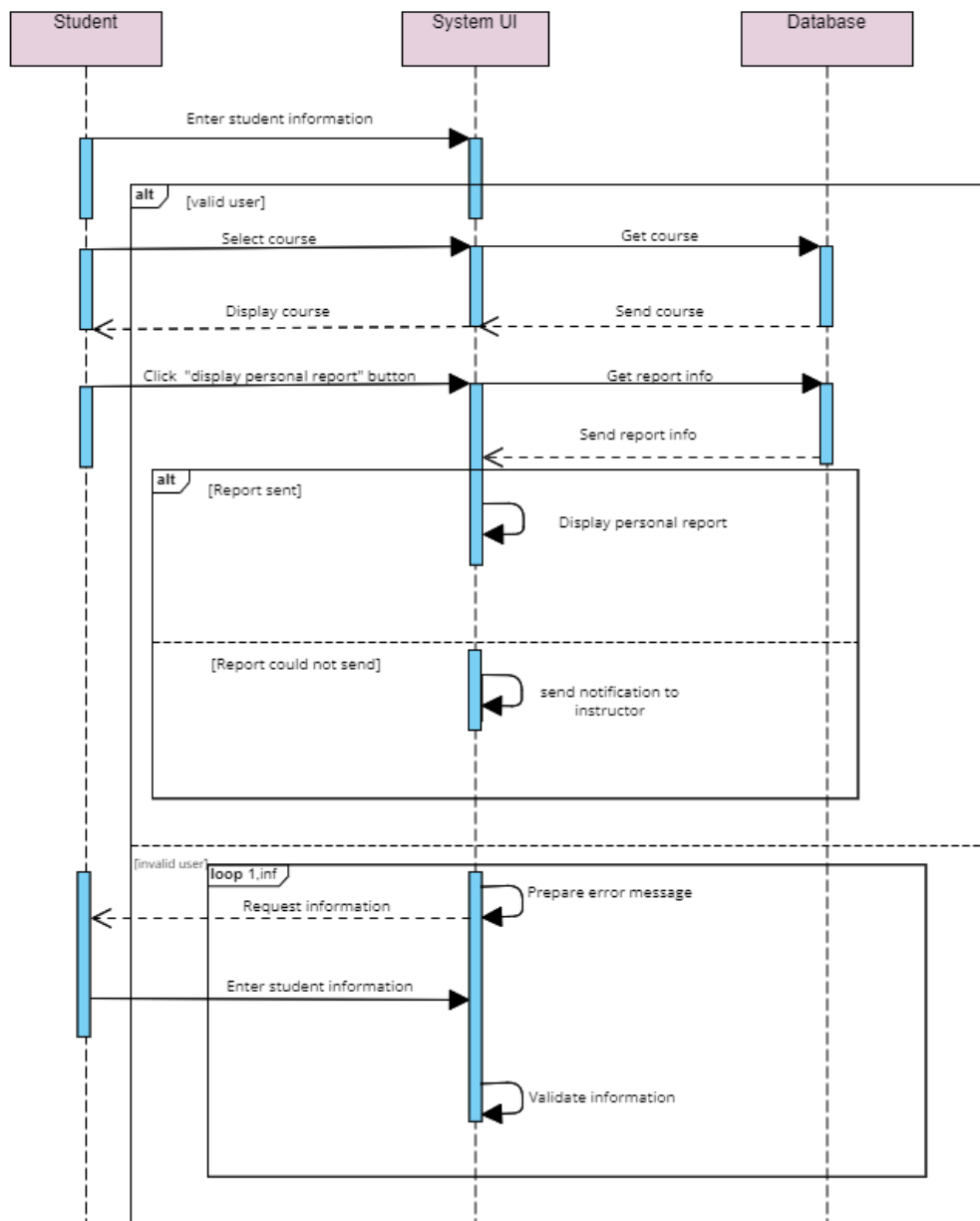
2) Add Course:



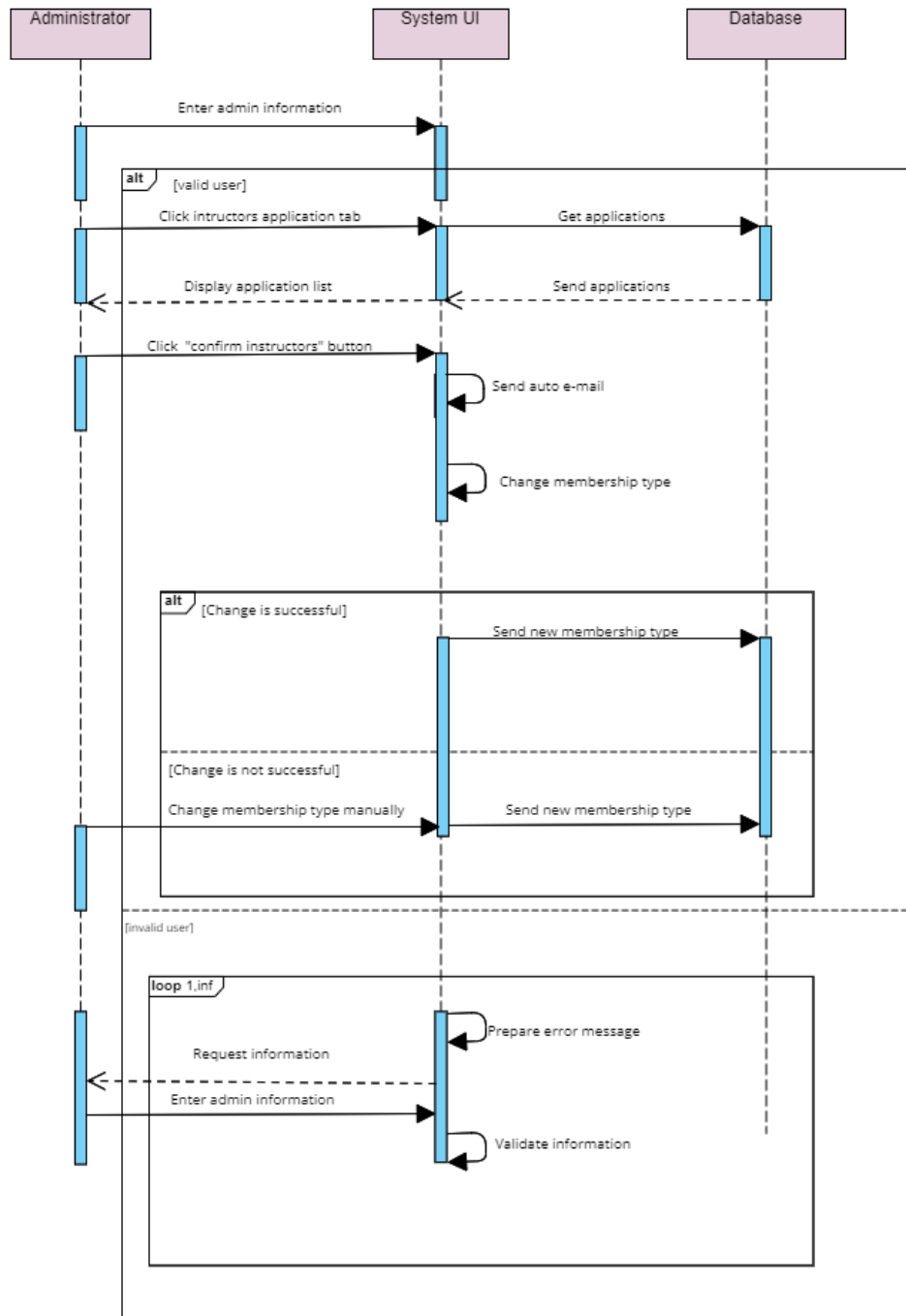
3) Take Exams:



4) Display Personal Report:

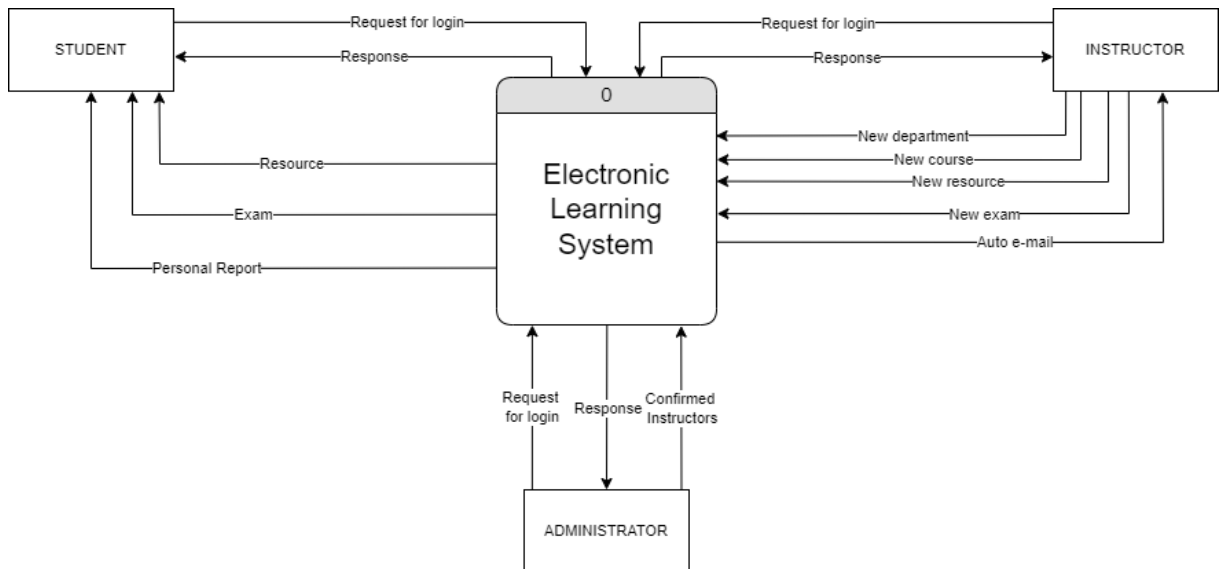


5) Confirm Instructors:



CHAPTER#4

a) Context Level DFD:



b) Level-0 DFD:

