Dhirubhai Ambani
Institute of Information and Communication Technology

Date - 23/03/23

IT314: Software Engineering
Lab 6
G-23
Student Information System

- ## Domain Analysis

➢ **Entity Objects:** Entity objects refer to the different types of data that the system is designed to manage.

1. **Degree:** This entity represents the degrees offered by the institute (eg - BTech, MTech)
2. **Branch:** This entity represents the branches offered by the institute (eg - ICT, MnC)
3. **Course:** This entity lists all the courses offered by the institute with the course code, name, credits and it's description (eg - Data Structures)
4. **Program:** This entity represents the programs offered by the institute. It states the degree and branch of the program, with the list of all courses available in that program throughout the curriculum. (eg - BTech ICT)
5. **Semester:** This entity represents semester details like name, date created and the programs which are going to be offered in that semester.
6. **Student:** This entity contains details of all the students. It includes personal details as well as the credentials required for login.
7. **Instructor:** This entity contains details of all the instructors. It includes personal details as well as the credentials required for login.
8. **Admin:** This includes the credentials required for login of all the admin users.

9. **Course-Assignments:** This entity includes details of which course of which program is assigned to which instructor in which semester.
10. **Course-Enrollments:** This entity include details of which course enrolled by which student in which semester, with the grade achieved by student and the attendance of each student
11. **Fee-status:** This entity represents the fee payment status of each student in each semester

➢ **Attributes:**

1. **Degree:** Degree name
2. **Branch:** Branch name
3. **Course:** Name, Course code, Credits, Description
4. **Program:** Branch, Degree, Courses
5. **Semester:** Name, Date-created, Program
6. **Student:** First-name, Middle-name, Last-name, Student-ID, College email, Personal email, Parent email, Gender, Date of birth, Program enrolled, Mobile number, Password
7. **Admin:** Email, Password
8. **Instructor:** Full name, College email, Mobile number, Date of birth, Gender, Personal email, Password
9. **Course-Assignments:** Semester, Program, Course, Instructor
10. **Course-Enrollments:** Course, Student, Semester, Grade, Attendance percent
11. **Fee-Status:** Student, Semester, Fee-status

➢ **Boundary Objects:** Boundary objects are artifacts or concepts that are used by instructors, students, administrators and parents to communicate and collaborate with each other.

1. **Student Records:** They could include information such as attendance grades. These records allow instructors, admin and parents to keep track of student's progress.

2. **Course Information:** They provide a shared understanding of which instructor is responsible for which class and who is enrolled in that course. They can help students and instructors to plan their routines.

3. **Curriculum maps:** They outline the scope of courses and branches offered. It allows students to get information about the courses of their study.

4. **Communication Tool:** This could include mail or a complaint box. These tools allow stakeholders to communicate with each other in real time, providing a means for collaboration and problem-solving.

➢ **Control Object:**

The processes and controls that enable a student management system to manage and monitor the activities of students and the educational institute are known as the control objects.Control Objects decides the flow of data within the student management system.

1. **Login management :** This object is used to manage the student, faculty and admin login.After authentication, student/faculty/admin has access to the student information system.

2. **Student Details:** This object is responsible for managing the student's personal and academic information. It also displays the same.

3. **Check Result :** This object will navigate the control to the page that displays the result of the student.

4. **Enrolled Course:** This object displays the page that shows the courses enrolled by a particular student.

5. **View Fees Receipt:** This option will navigate the control to the page that will show the fees receipt of paid fees to logged in students.

6. **Feedback:** This object is responsible for the giving feedback by the students.

7. **View Attendance:** This object is responsible for viewing students attendance, it is used to track and monitor student's attendance in classes.

8. **Add Semester:** This object can only be accessed by the admin. It provides the functionality that adds up the semester to the whole student management system.

9. **Add Program:** This object can only be accessed by the admin. It provides the functionality of adding the program.

10. **Add Course:** This object can only be accessed by the admin. It provides the functionality of adding the course.

11. **Add Degree:** This object can only be accessed by the admin. It provides the functionality of adding the degree.

12. **Add Branch:** This object can only be accessed by the admin. It provides the functionality of adding the branch.

13. **Enter Attendance:** Faculty or admin can control student attendance in their classes with this control object. It allows the faculty to take attendance, track absence, and produce reports.

14. **Publish Grade:** This object is responsible for managing student's grades of assignments, tests, and other assessments, which are provided by the faculties.

15. **Course Registration:** This object will navigate to the page that shows the total number of registered students in the particular course.

The control of a particular actor over the student management system depends on the role of that actor within the system.

Student can

- View or update personal information and password
- View results
- View fee receipt
- View Attendance
- Register for a semester and selecting the course to be enrolled in

Faculty can

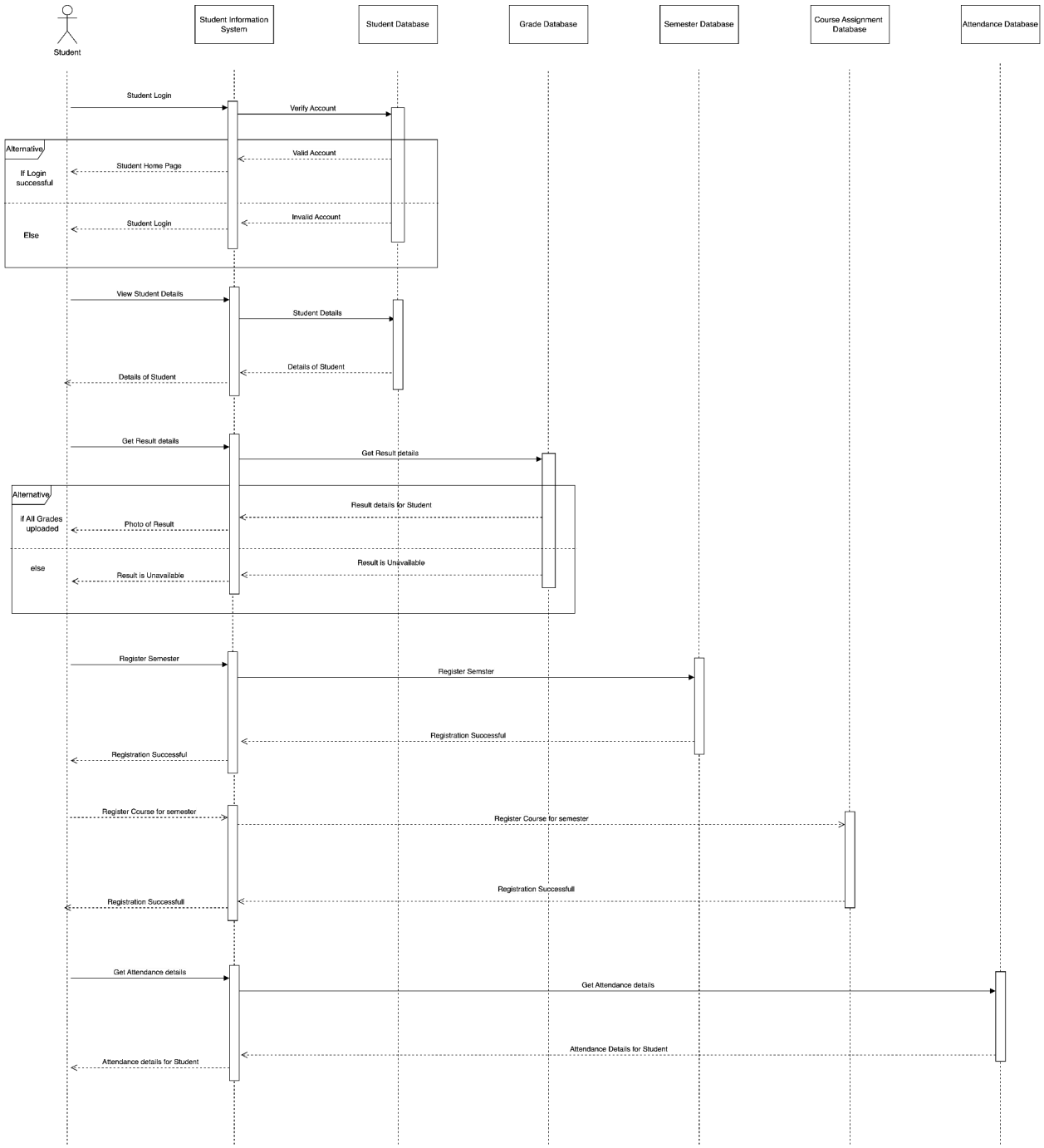
- View or update grades ,attendance
- View the number of students who have enrolled in a particular course.
- View or update personal details and password.

Administrators can

- View students personal details and academic details.
- View instructor details
- Update fee payment status of students
- Add new semester and assign instructors to courses
- Add new course
- Add new program (branch and degree)
- Add new students
- Add new instructors
- View all the details over the student management system.

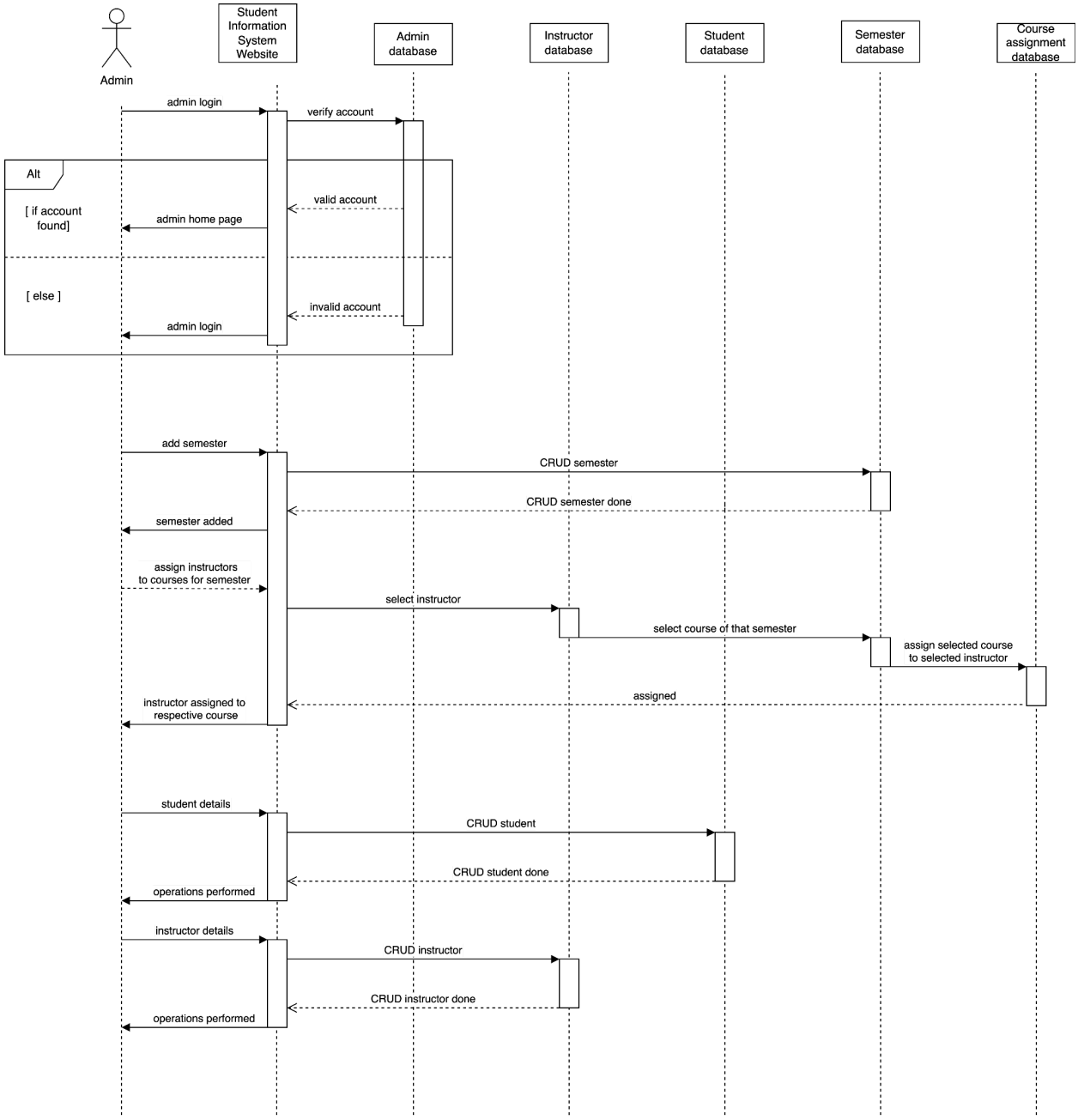
➢ **Sequence diagram:**

➢ **As A Student Side:**



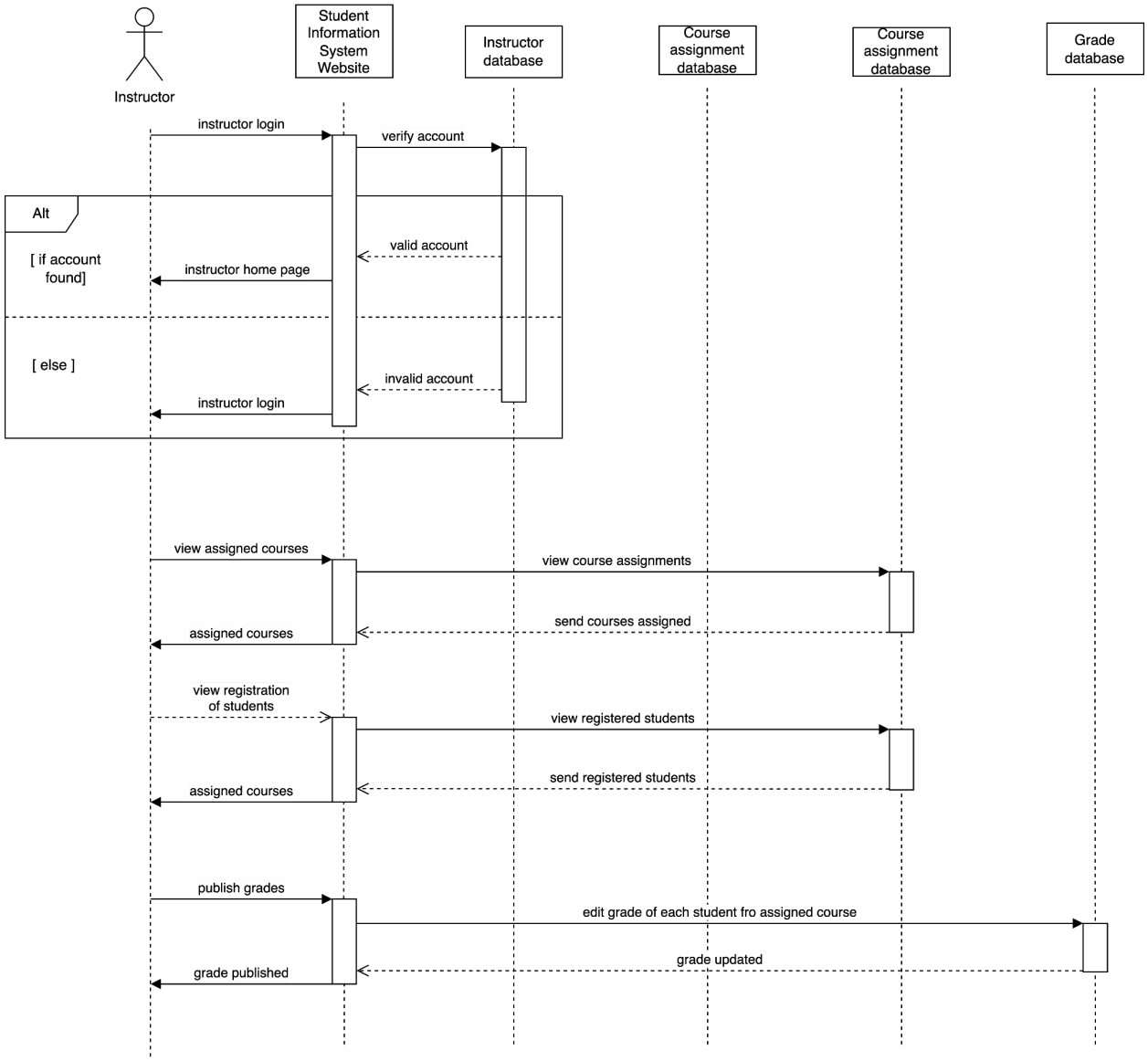
➢ **Link:**https://drive.google.com/file/d/1BkxGy1KID52hcFPIpnFiffE5Y_lbhiblk/view?usp=share_link

➢ As A Admin Side:



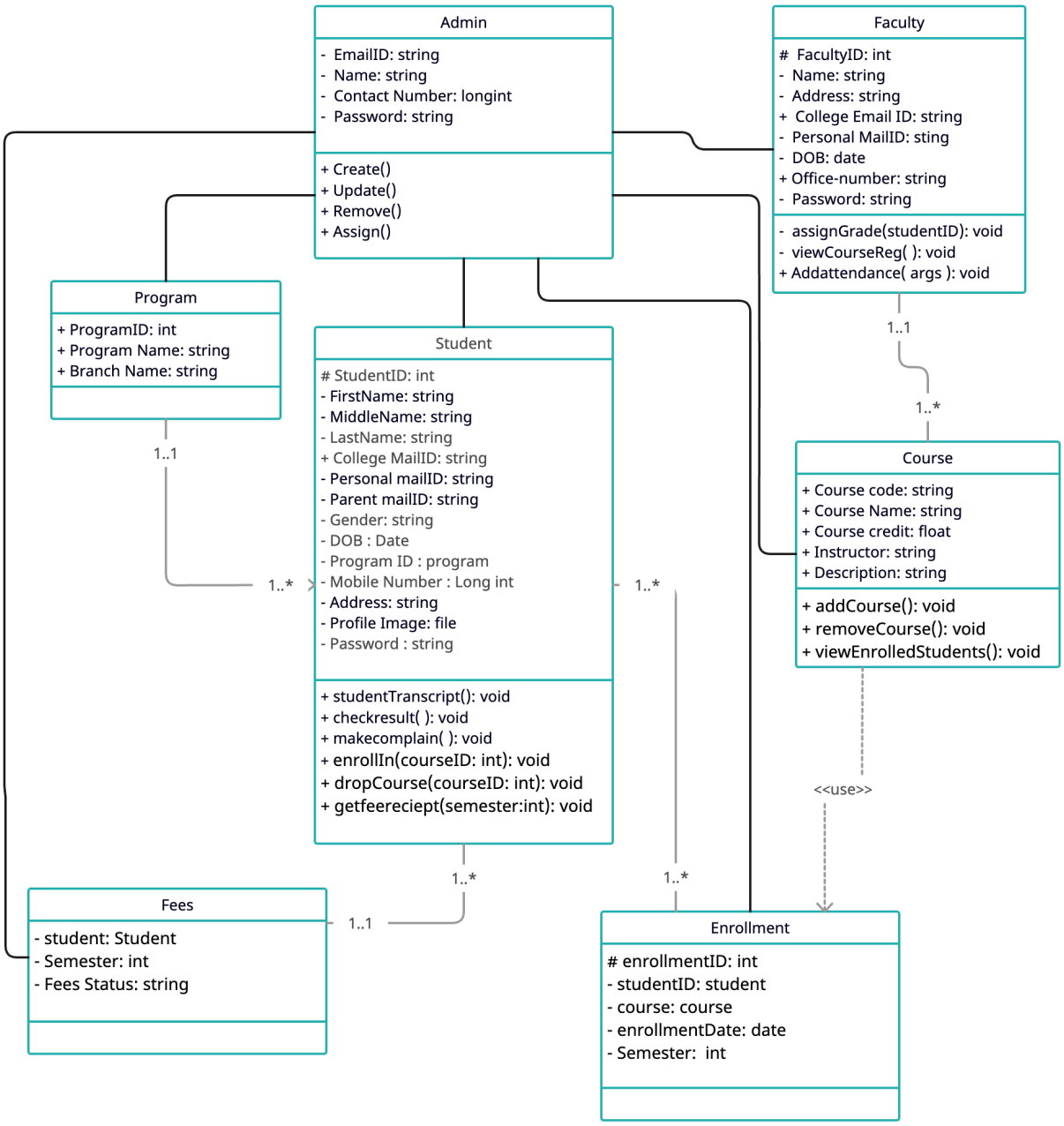
➢ Link:https://drive.google.com/file/d/1LJyp7VAQO9Jm25Y_xcbPEw-O-i9j_jxs/view?usp=share_link

➢ As A Faculty Side:



➢ Link:https://drive.google.com/file/d/1QmHMjJR9vMlw7URGnnTFyTPCDEWTyPgQ/view?usp=share_link

➢ Class Diagram:



➢ Design Goals

1. **Reliability-** The system should be dependable and available when needed, with minimal downtime and disruptions.
2. **Maintainability-** The system should be easily maintainable rapidly and can be restored after any failure.
3. **Portability-** The SIS should be accessible from anywhere. System can be accessible from outside the institute also.
4. **Robustness-** Ability to operate effectively and reliably under various conditions and potential failure scenarios.It must handle large amounts of data, complex workflows, and unexpected events without crashing or losing data.
5. **Usability-** As the system is easy to handle and navigate in the most expected way with no delays.
6. **Utility-** The extent to which system satisfies the needs of the user or meets a particular requirement or objective
7. **Availability-** The system must be available 24/7.
8. **Flexibility-** The ability of a system to adapt to changing user needs or requirements, without requiring significant modification or redesign.
9. **Increased Productivity-** Systems must be tailored to the specific needs and workflows of its users, enabling them to work more efficiently, save time, and reduce errors.
10. **Low Cost-** The ability of a system to deliver its intended functionality at a reasonable or competitive cost, including factors such as production, maintenance, and support costs.
11. **Runtime Efficiency-** The ability of a system to perform its intended function with minimal resource consumption, including factors such as memory usage, processing time, and energy consumption.
12. **Functionality-** The ability of the system to perform its intended task or function effectively and efficiently. A design goal related to functionality would focus on ensuring that the product or system is designed to meet the needs of its users and provide the desired features and capabilities.

13. **Learnability-** The ease and speed with which a user can learn to use a product or service, including factors such as intuitiveness, simplicity, and ease of use.
14. **Good Documentation-** The availability and quality of documentation to help users understand how to use a product or service, including factors such as clarity, completeness, and accuracy.
15. **Security-** The system should be secured with different levels of security for different users.
16. **High Performance-** System should be able to manage traffic of at least 800 users at the same time. The system should respond quickly to user requests and have fast processing times,minimum delay, even during peak usage times.
17. **User Friendliness**- The system should have a friendly user interface to create a positive user experience by reducing the effort required to complete tasks, minimizing the potential for errors, and providing users with a sense of control and satisfaction. This can lead to increased productivity, user engagement, and user loyalty.

● High level system design

➢ **Architecture:**

Since in our system admin(host), delivers, and manages most of the resources and services that the student/faculty requests. The SIS will be built best using a client-server architecture(2-tier) style. The client will be a web-based interface that allows users to interact with the system, while the server will be responsible for processing requests, storing data and providing the required services.

➢ **Subsystems:**

1. **User Interface Subsystem:** This subsystem will provide a web-based user interface for students, faculty, and administrators to interact with the system. It will include features like login, dashboard, student profile, result, complaint box and other academic relevant information.

2. **Student Information Management Subsystem:** This subsystem will be responsible for managing student data such as personal information, academic records, attendance, and enrollment information.

3. **Faculty Information Management Subsystem**: This subsystem will be responsible for managing faculty data such as personal information,courses they teach, and other relevant information.

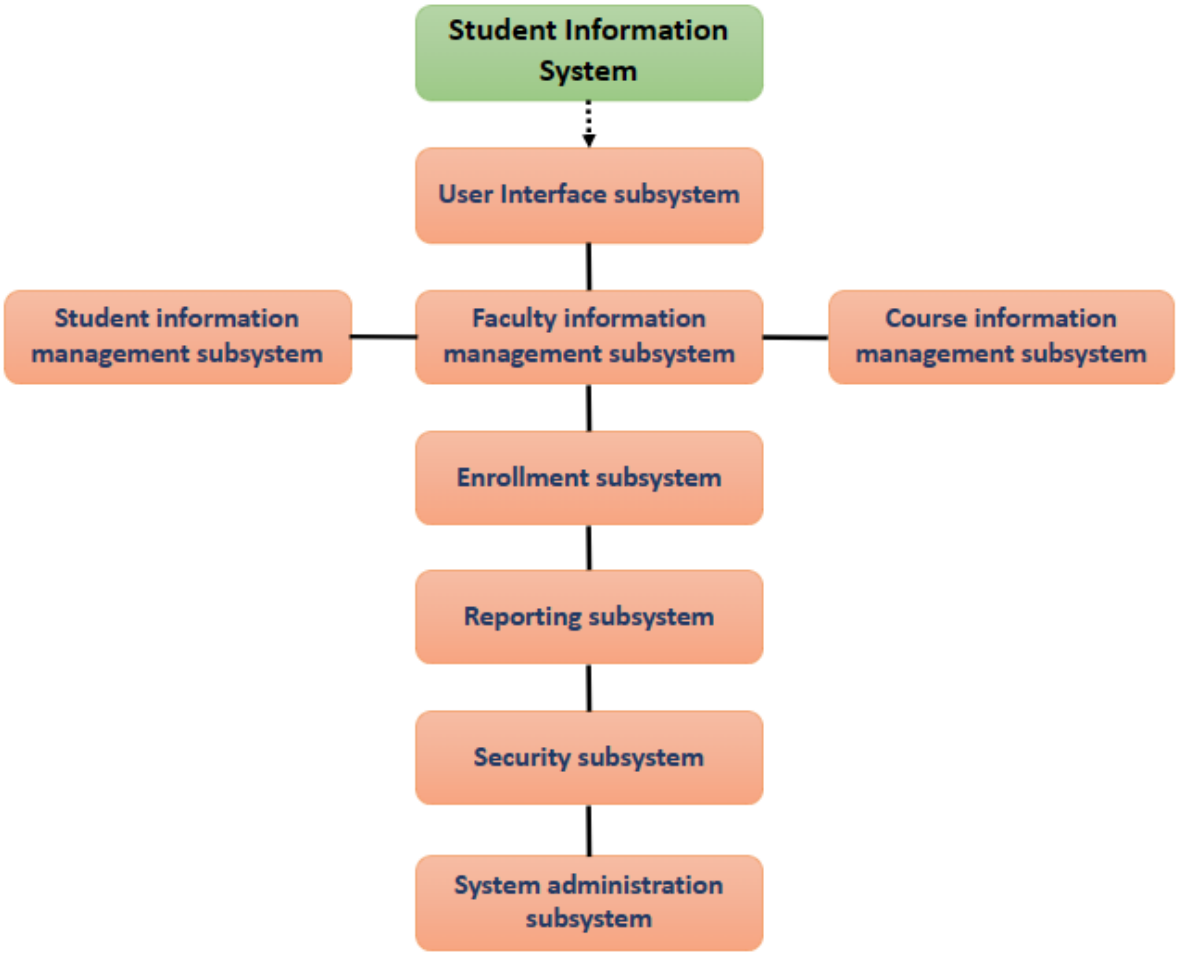
4. **Course Information Management Subsystem:** This subsystem will be responsible for managing course data such as course catalogs, prerequisites, credits, instructors and course descriptions.

5. **Enrollment Subsystem:** This subsystem will handle the process of enrollment for students, including registration, and course selection.

6. **Reporting Subsystem:** This subsystem will be responsible for generating reports based on the data stored in the system. Reports can include student transcripts, enrollment reports, course assigned, grade card and other relevant information.

7. **Security Subsystem:** This subsystem will be responsible for ensuring the security of the system, including authentication, authorization, and access control.

8. **System Administration Subsystem:** This subsystem will be responsible for system administration tasks such as backup and recovery, user management, system configuration, and system maintenance.


Student Information System
User Interface subsystem
Student information management subsystem
Faculty information management subsystem
Course information management subsystem
Enrollment subsystem
Reporting subsystem
Security subsystem
System administration subsystem