



ADipIT02– Object-Oriented Design and Programming

TOPIC: COLLEGE MANAGEMENT SYSTEM

Group Name: Infinity Group

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1. Description and Application

1.1. Description

This project contains details of the information management system of the college like Student, Staff (Technical or Non-technical) create login and password, using these staff, student can upload or download some information like college materials published by staff. From this project student and staff can easily access their important data like coursework and submit their project work. Easily for maintaining the record of the student and staff. Easily access student their result and attendances. Searching of the student or staff data will be easily carried out comparison to manual searching. Reduces the cost and time of the college.

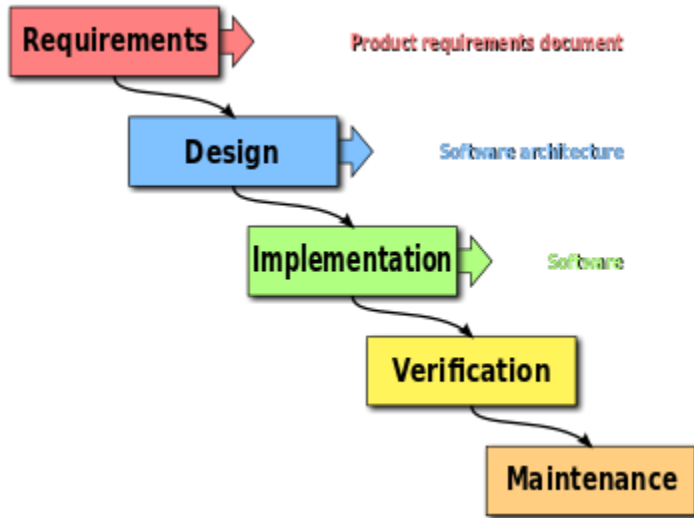
1.2. Application

Education management system

2. Methodology

2.1. SDLC process models

2.1.1. Classical Waterfall



Requirement:

1) User Class and Administration

- Administrator :

The admin keeps track of admission of new students to the department, entries of new staff to the department, entry of attendance information. Admin can modify the data.

- User:

User can retrieve the information from database by sending the queries.

2) Functional Requirement

- Entry of new student to the department.
- Entry of new Staff to the department.
- Entry of attendance information.
- Entry of examination marks.
- Provide individual and class-wise report.
- Update the student profile depending on attendance and exam status.

3) Non- Functional Requirement

- The system should be easy to handle
- System should give expected performance results
- The response time should be as small as possible.
- Database should be secured
- Database backup is required for safety(Only in case of OS failure or Virus attack)
- Admin can also modify and append the data whereas Users can only retrieve the information about database.

4) External Interface Requirement

User Interface:

- A login screen for entering the username and password.
- Screen for displaying the major tasks like delete, add and view details of student
- Separate forms for performing the above major tasks
- Another separate screen for users to view the information.

Software Interface

- Operating System: Windows XP, Vista, 7, 8 and Higher
- Platform: .NET
- Database: SQL server
- Language: Visual Studio 2013 or higher

Hardware Interface

- Intel Pentium 4 or Higher
- 1.5 GHz
- 512 MB of RAM or Higher

5) Software System Attributes

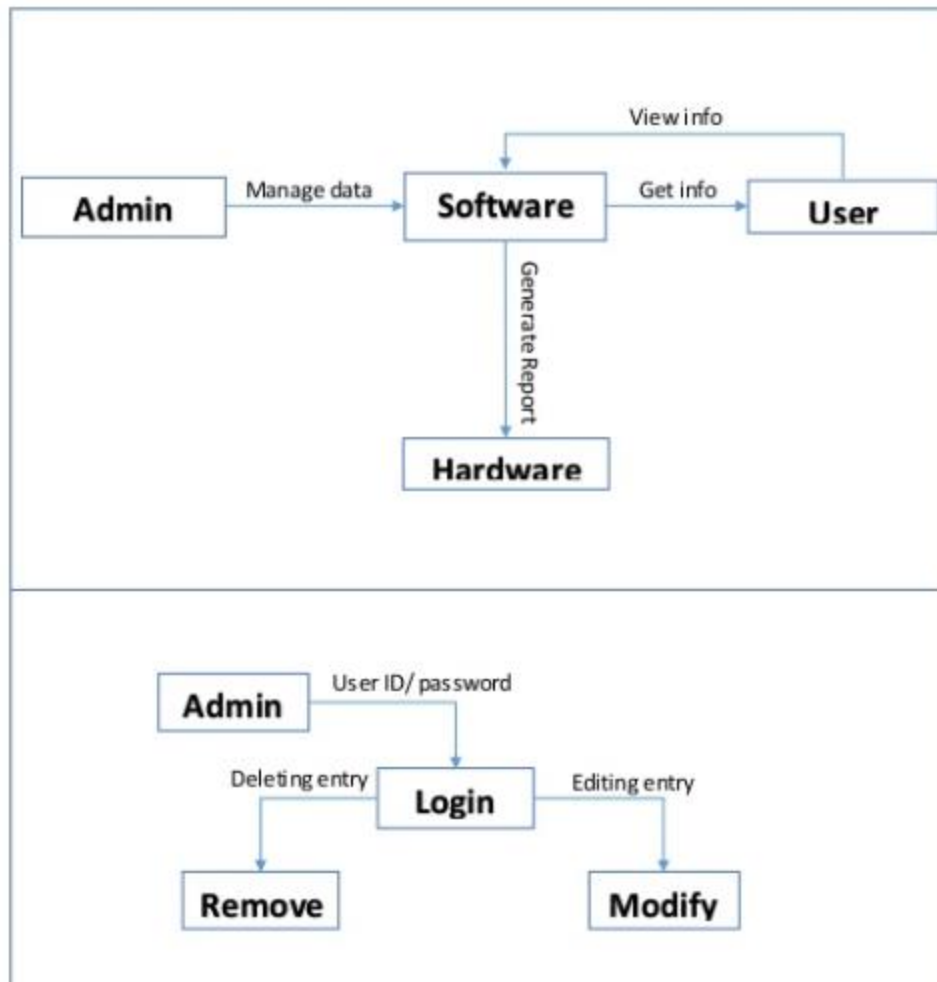
- The application is easy to interact and communicate with user.
- This application provides better user interface for ease of working.

System Design:-

System is the process by which an agent creates a specification of a system, intended to accomplish goals. The objective of the system design is to deliver the needs as specified. Software design usually involves problem solving and planning a software solution.

It involves logical design and physical design. The logical design describes the structure and characteristics of the features such as outputs, inputs, files, databases and procedures. Logical design specifies user need at the level of details that virtually determine the information flow into and out of the system and required data resources. Physical design is the actual implementation of the logical design. It is all about drawing how the system looks physically.

Architectural Design



Implementation:-

It is the process in which actual implementation of the physical design takes place through coding. Proper coding and the development, proving and integration of the whole system are processed.

Testing:-

The code is then handed over to the testing team. Testers check the program for all possible defects, by running test cases either manually or by automation. The client is involved in the testing phase as well, in order to ensure all requirements are met. All Flaws and bugs detected during this phase are fixed to ensure quality assurance.

Maintenance:-

This makes for the final phase of the waterfall model, where the software is deployed at the client's side, after it has undergone thorough testing. After the deployment of the software, routine maintenance work is carried out. Once the software has been deployed, in case the customer asks for any changes or enhancements, then the entire process is restarted.

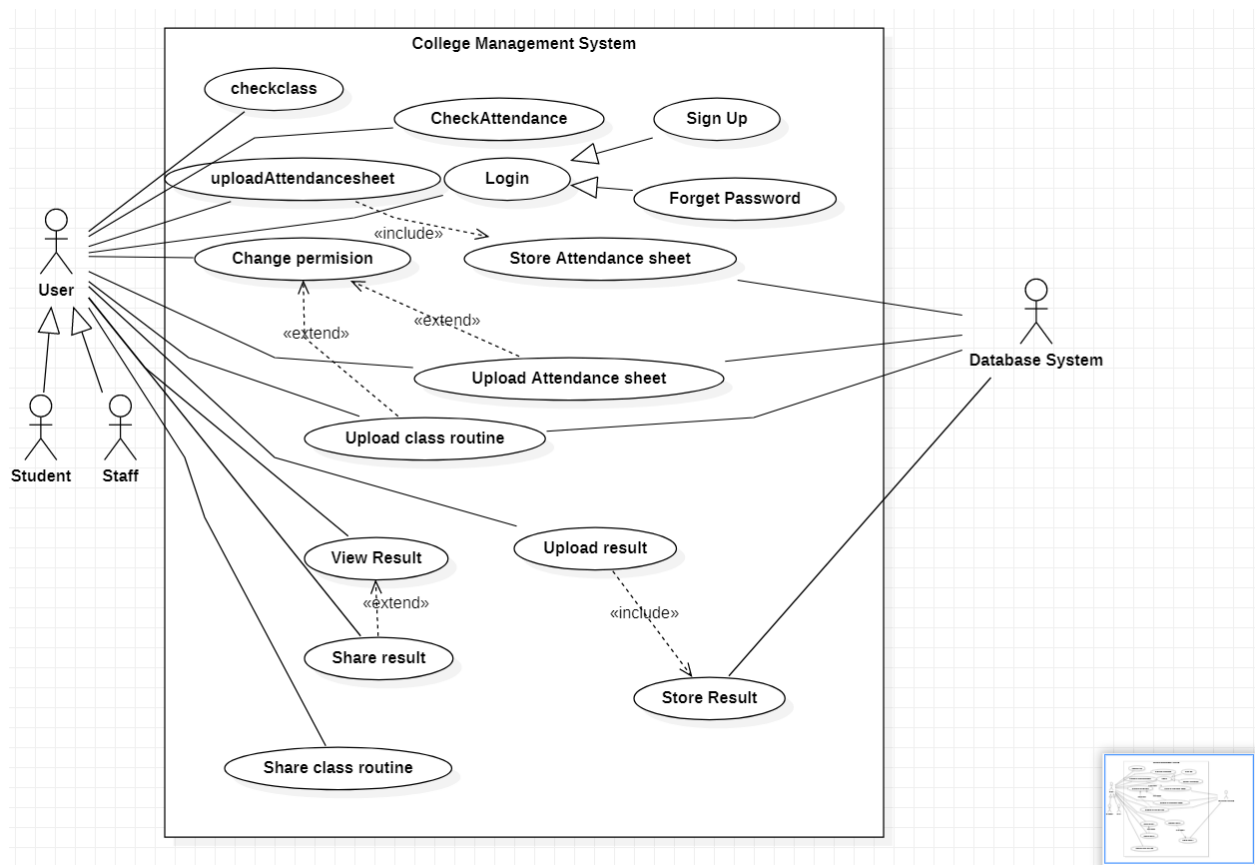
Advantages of waterfall model

- Simple and easy to understand and use.
- It allows for departmentalization and managerial control.
- Waterfall model works well for smaller projects where sequence is very well understood.
- Phases are processed and completed one at a time.
- The tasks remain as stable as possible throughout the development process.

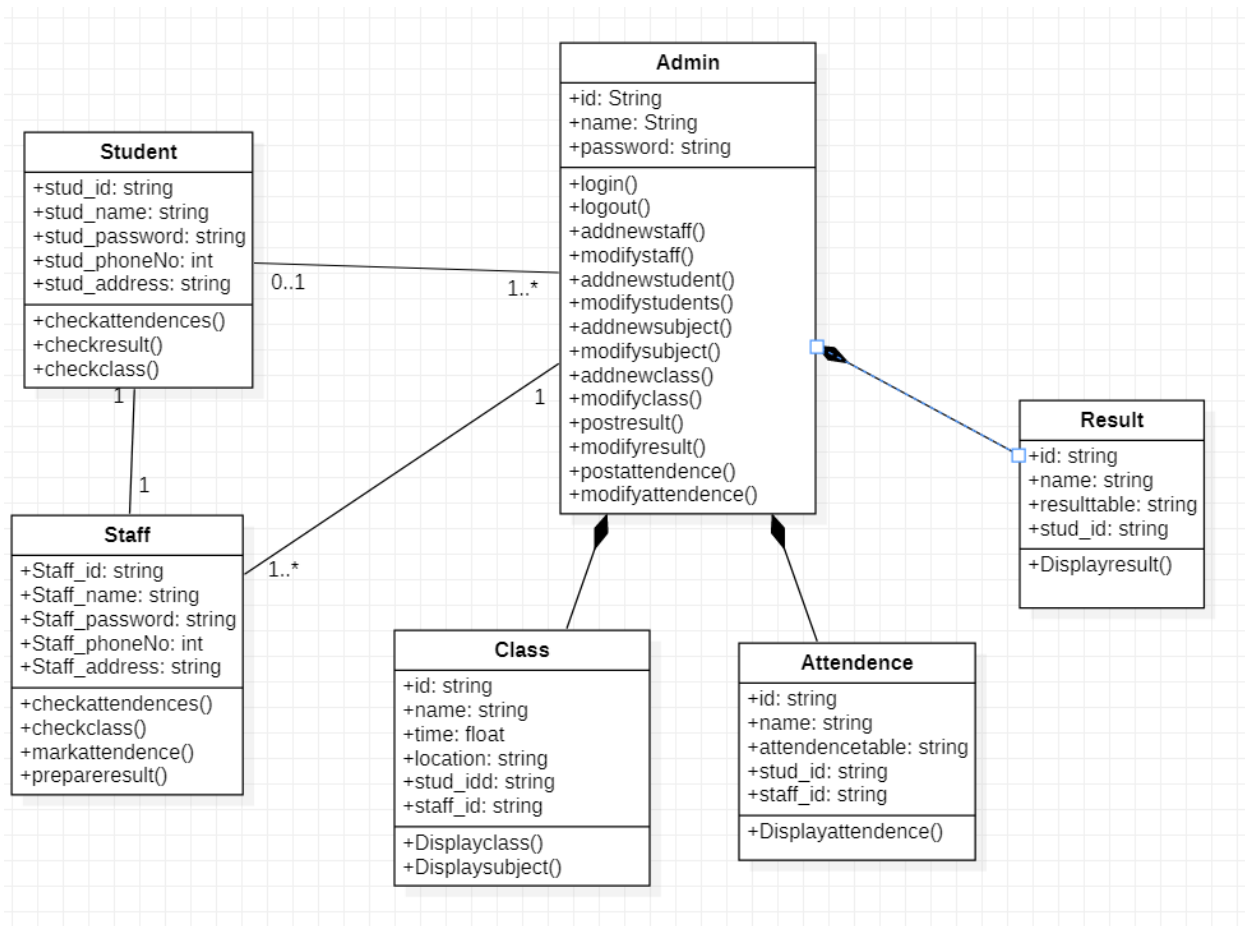
Disadvantages of waterfall model

- It does not allow for much reflection or revision.
- High amounts of risk and uncertainty.
- Poor model for long and going projects.
- Not a good model for complex and object-oriented projects.
- Errors can be fixed only during the phase.

2.2. Usecase diagram



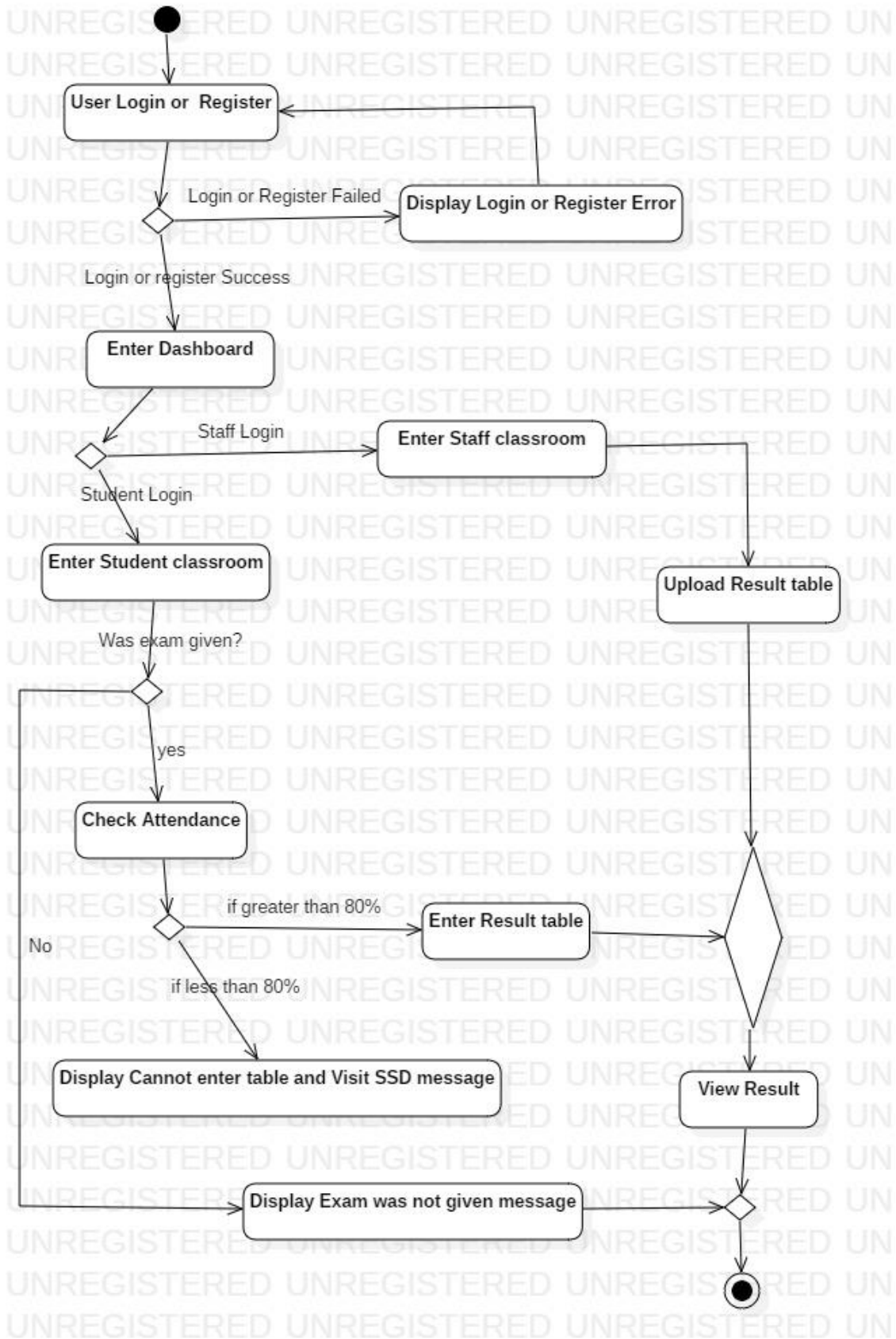
2.3. Class Diagram



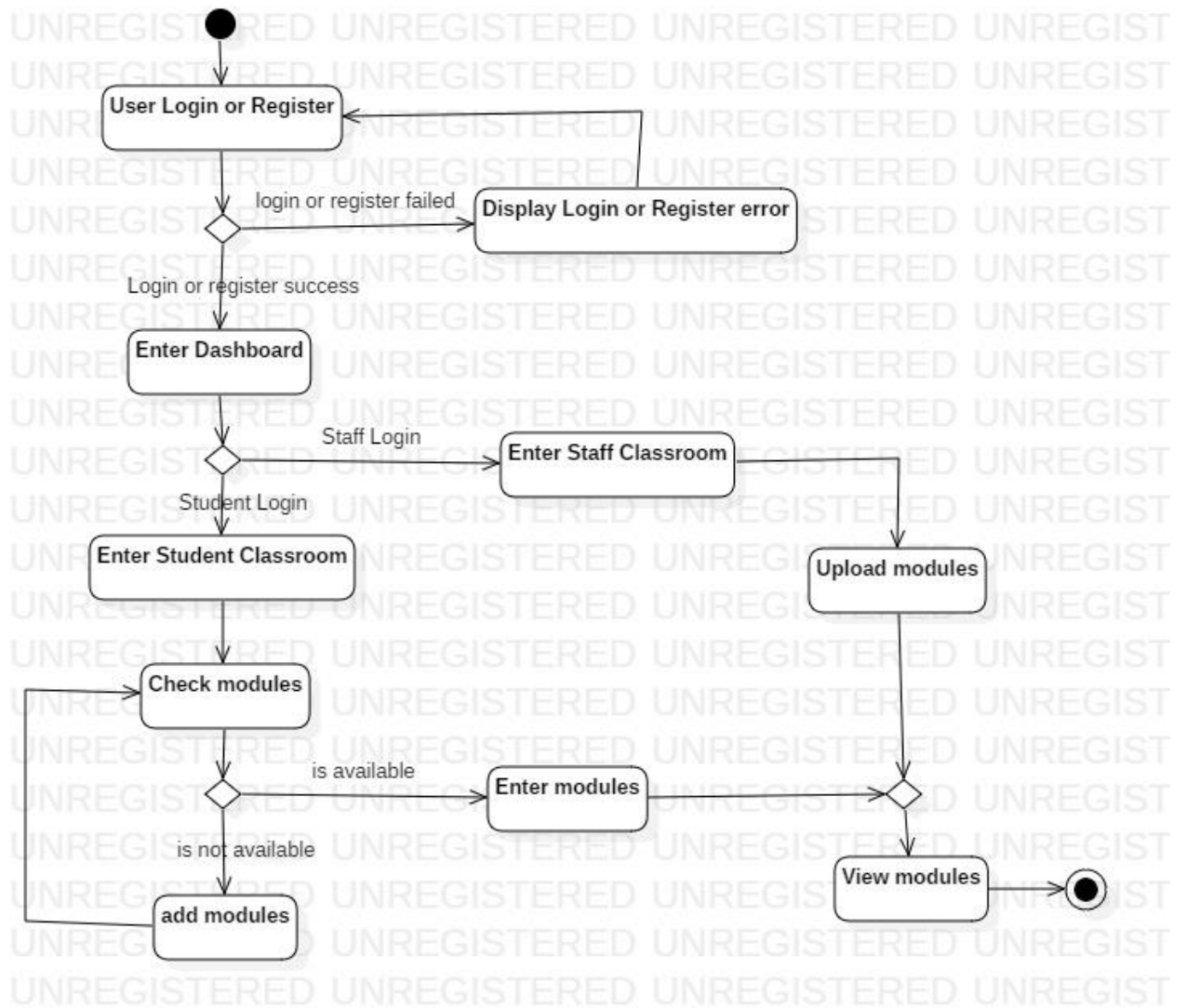
2.4. Activity Diagram

2.4.1. Activity diagram for checking exam results

In the activity diagram below, the first activity is to login or register by the student and staff member. In any case of login or register being failed, then process is again repeated until the activity is fully completed. After login being successfully done, then the person will be allowed to enter the classroom. If the person is staff, then he will be entering in Staff classroom whereas if the person is student then he/she will enter in student classroom. After entering in the staff classroom, the staffs then will upload the result table. Students firstly have to verify whether or not they have given the exam. If students have given the exam then only they are allowed to check their attendance. Students can check their attendance firstly to see whether their attendance is greater than 80% or not. If their attendance is greater than 80% then only they are allowed to view the result by entering in the result table. But if their attendance is less than 80% then they are not allowed to see their result and have to visit the Student Service Department for further enquiry.



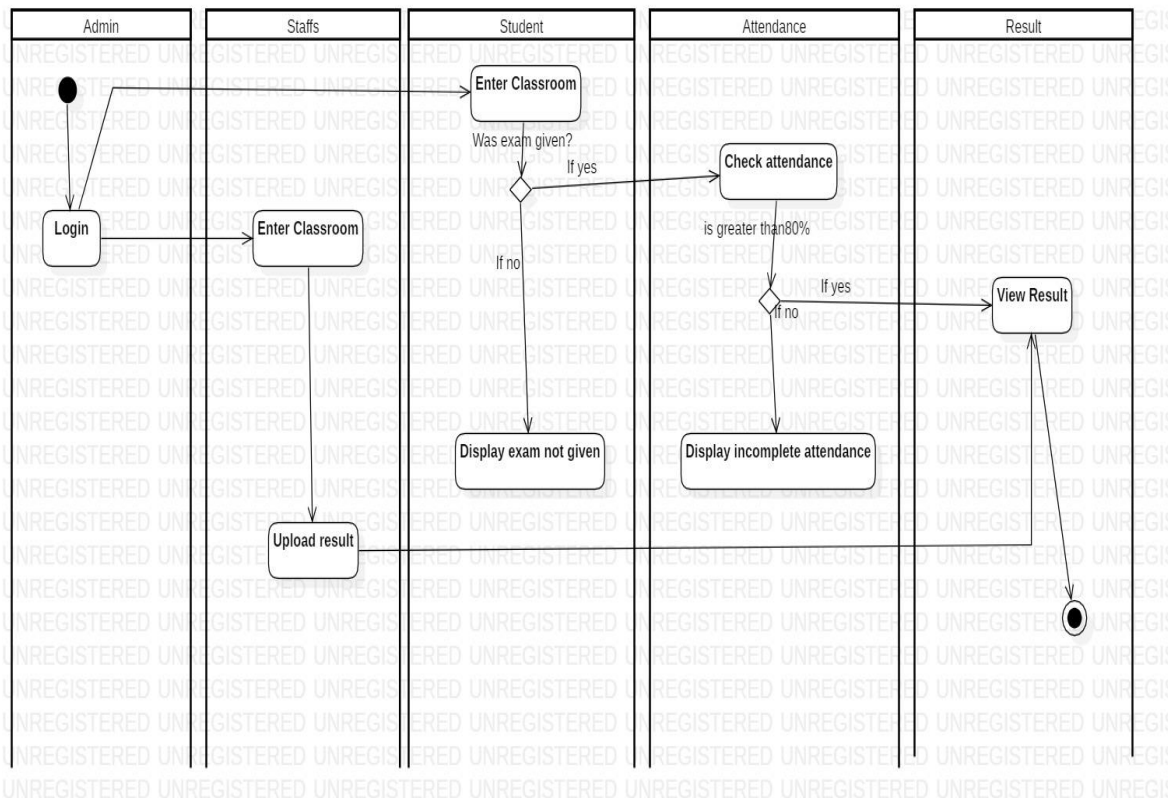
2.4.2. Activity diagram for viewing different modules



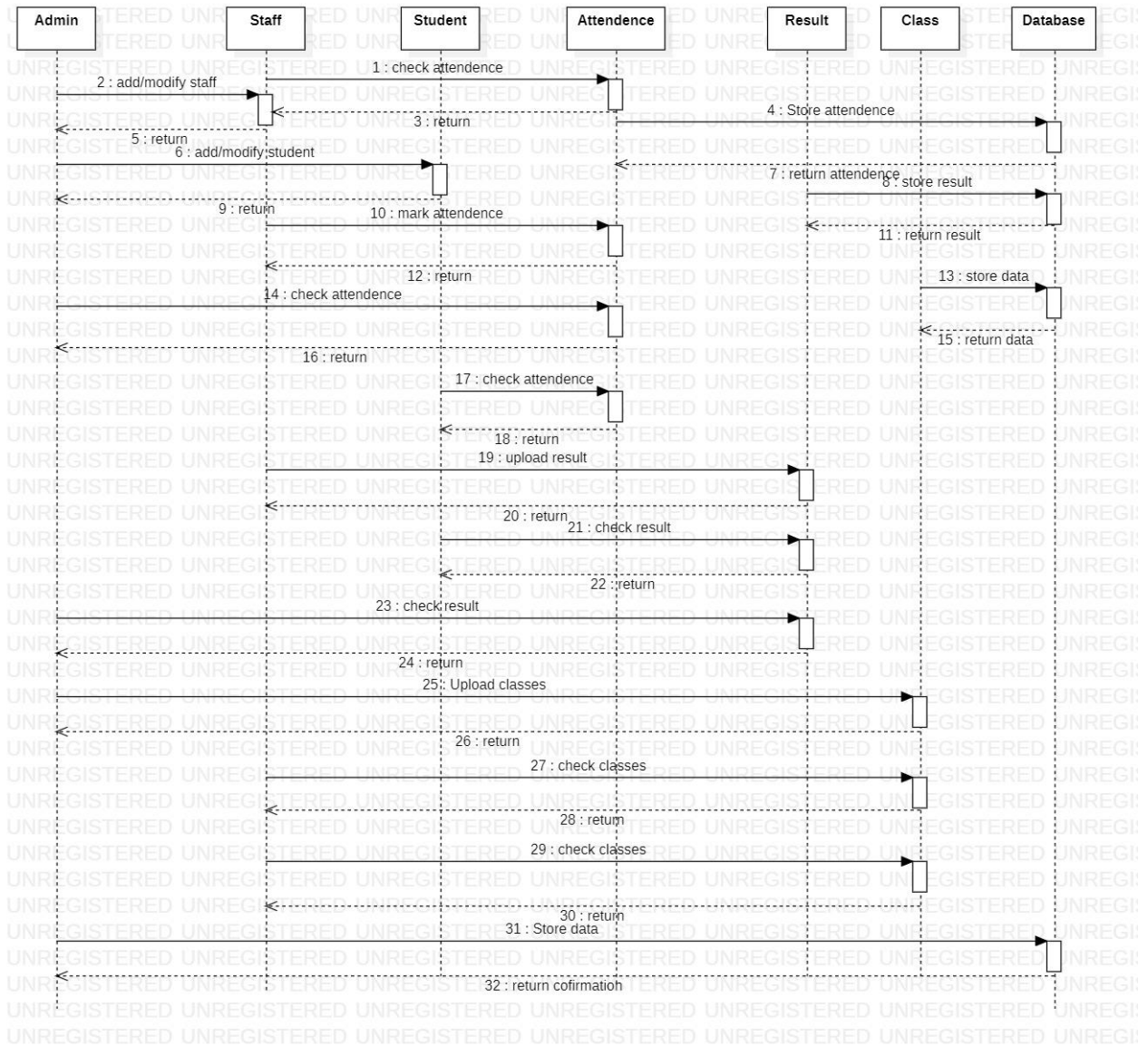
This activity diagram describes the activities involving in viewing the courses (modules) in the classroom. First of all, the user enters into the classroom by login or registering. If password mistakes occur or any other error occur then again login process is repeated. After the successful login, the user is then allowed to enter the classroom. Staff uploads the modules whereas students check the modules whether or not it is available. If the modules are not available then students have to add the modules. And then again check the modules. After checking the modules, students are allowed to view the modules and learn the course topics.

2.5. Swimlane Activity Diagram

In the swim lane diagram below, first activity is to login into the system by the student or staff. In the case that the login gone failed, it will be repeated until the activity is completed. After the completion of login, the person will be allowed to enter the classroom. If the person is student, then he/she will enter to the student classroom whereas if the student is staff then he/she will enter to the staff classroom. After entering the staff classroom, the staff will upload the result. For this, student must check whether they have given the exam or not. If they have given the exam, they can check their attendance, only when the attendance is greater than 80%. If the attendance is greater than 80%, they can see their result. And if the attendance is less than 80%, a message named “Incomplete Attendance” is displayed.



2.6. Sequence Diagram



3. Software Architecture

Software architecture is a description of the sub-systems and components of a software system and the relationship between them. The software architecture of the system is an artifact. It is a result of the software design activity.

Schematic of a layered architecture:

- Closed Architecture message may only be sent to the adjacent lower layer.
- Open Architecture message can be sent to any lower layer. (BENNETT, et al., 2015)

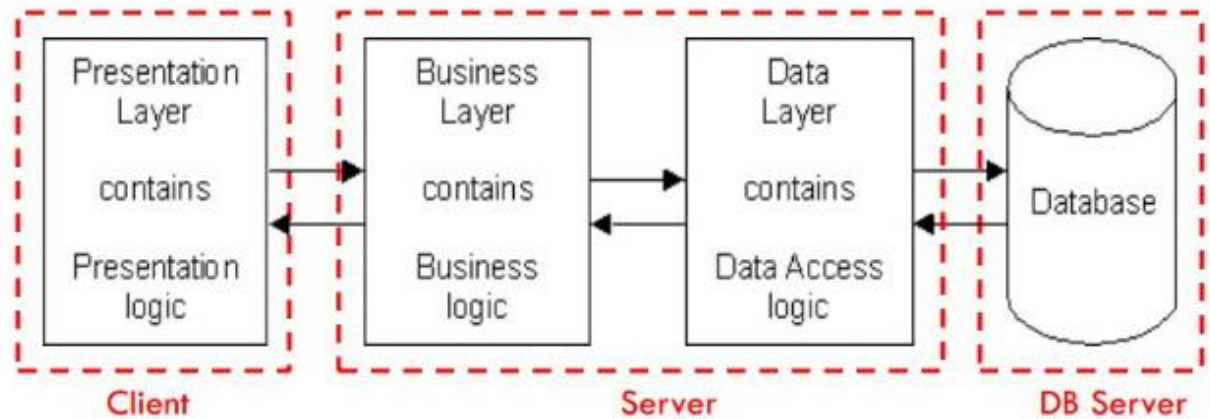
- 3-Tier/Layer Architecture: -

This layer is commonly used for business-oriented information systems.

This 3-Tier Architecture have three layers: -

- Presentation Tier
- Logic Tier
- Data Tier

3-Tier Architecture



- Each layer can potentially run on a different machine

This is the function of the business layer which accepts the data from the application layer and passes it to the data layer.

- Business logic acts as an interface between Client layer and Data Access Layer
- All business logic – like validation of data, calculations, data insertion/modification are written under business logic layer.
- It makes communication faster and easier between the client and data layer
- Defines a proper workflow activity that is necessary to complete a task.

This is the data layer function, which receives the data from the business layer and performs the necessary operation into the database.

- Reason for choosing 3-Tier Software Architecture

This is the most important layer of software Architecture. In 2 or 1-layer data representation is more difficult to modify either independently and tight coupling between the user interface

❖ The Advantage and Disadvantage of the Software Architecture are: -

Advantage: -

- Scalability
- Data Integrity
- Reusability
- Reduced Distribution
- Improved Security
- Improved Availability

Disadvantage: -

- Increase in effort
- Increase in complexity

Conclusion,

Hence, it is a part of a program which encrypts real-world business problems and determines how data can be updated, created, stored, or changed to get the complete task done.