**Indian Institute of Information Technology, Allahabad**

**Software Engineering**

SOFTWARE DESIGN

SPECIFICATION

**Academic Management System**

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**The Software Design Specification**

**1. Introduction**

The Software Design Document is a document to provide documentation which will

be used to aid in software development by providing the details for how the software

should be built. Within the Software Design Document are narrative and graphical

documentation of the software design for the project including use case models,

sequence diagrams, collaboration models, object behaviour models, and other

supporting requirement information.

**1.1 Purpose of this document**

This document will define the design of the one runway simulator. It contains specific

information about the expected input, output, classes, and functions. The interaction

between the classes to meet the desired requirements are outlined in detailed figures

at the end of the document.

**1.2 Scope of the development project**

We describe what features are in the scope of the software and what are not

in the scope of the software to be developed.

In Scope:

a. Portal based on web for the students to view it's academic progress and for the dean/registrar to view academic progress of any student.

b. Students can view it's profile and apply for any change in it's profile to the admin and also view all academic progress like profile of course coordinators etc.

c. Dean can view profile of any student and also edit it as per the student request and also view all academic progress like profile of course coordinators,academic details etc.

Out of Scope:

a. Students can't edit on their own in it's profile.

b. Any kind of academic process like allocation of courses,electives or result criteria are not in the scope of the portal.

**1.3 Definitions, acronyms, and abbreviations**

IEEE: Institute of Electrical and Electronics Engineers

SDS: Software Design Specification

AMS: Academic Management System

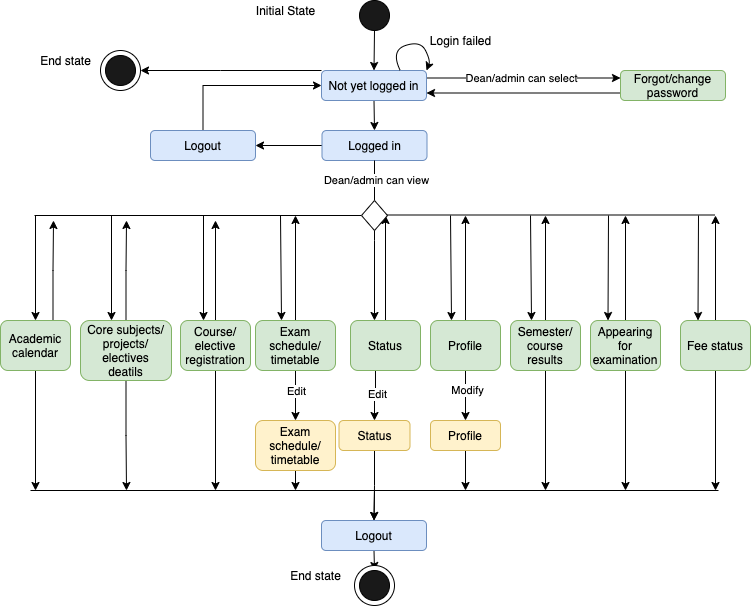
**1.4 References**

* https://www.slideshare.net/MJabin/erd-41331771
* https://www.slideshare.net/ASHOKKUMARPALAKI/uml-classdiagram-41336474
* https://www.slideshare.net/alirezasafian1/5state-diagrams
* https://www.slideshare.net/polarahul/sequence-diagram-45351901

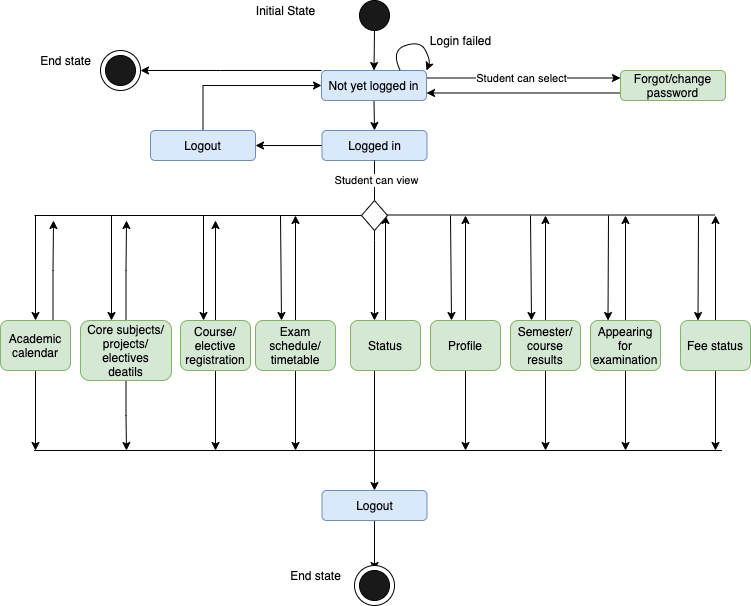
**2. Logical Architecture**

**2.1. State Diagram**

**2.1.1 Dean/ Admin State Diagram**

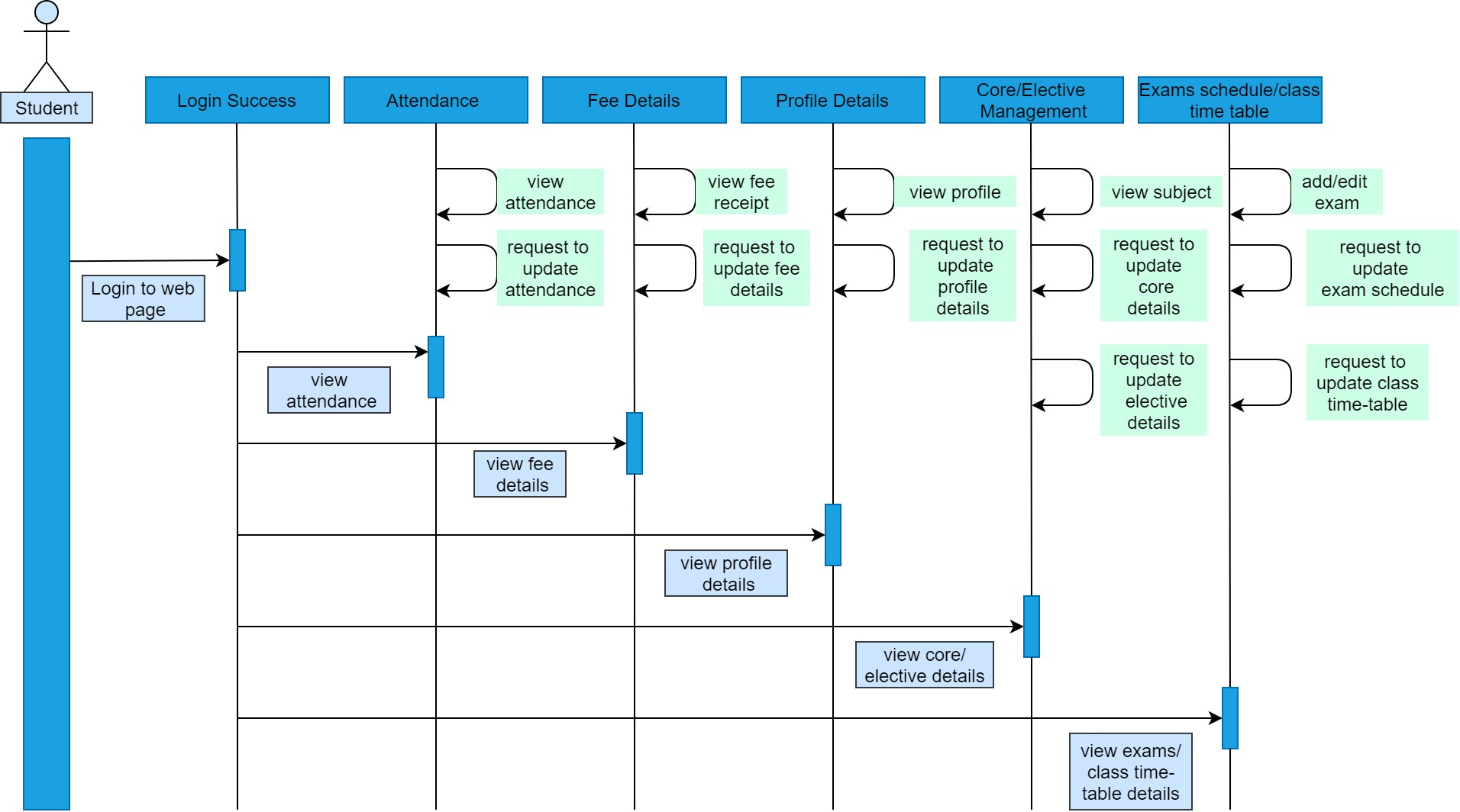


**2.1.2. Student State Diagram**

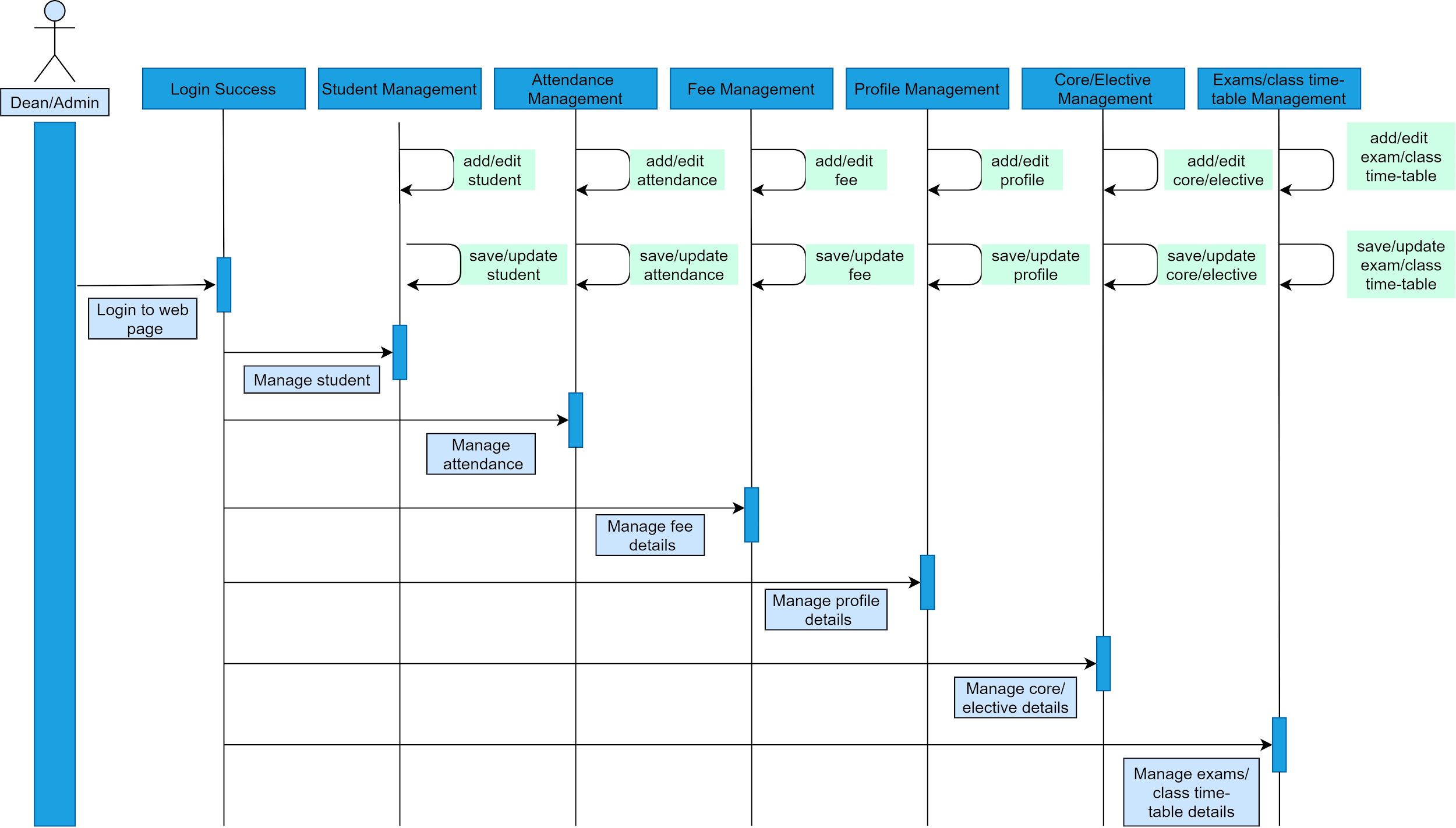
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**2.2. Sequence Diagram**

**2.2.1. Sequence Diagram for Student**

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**2.2.2. Sequence Diagram for Admin/Dean**

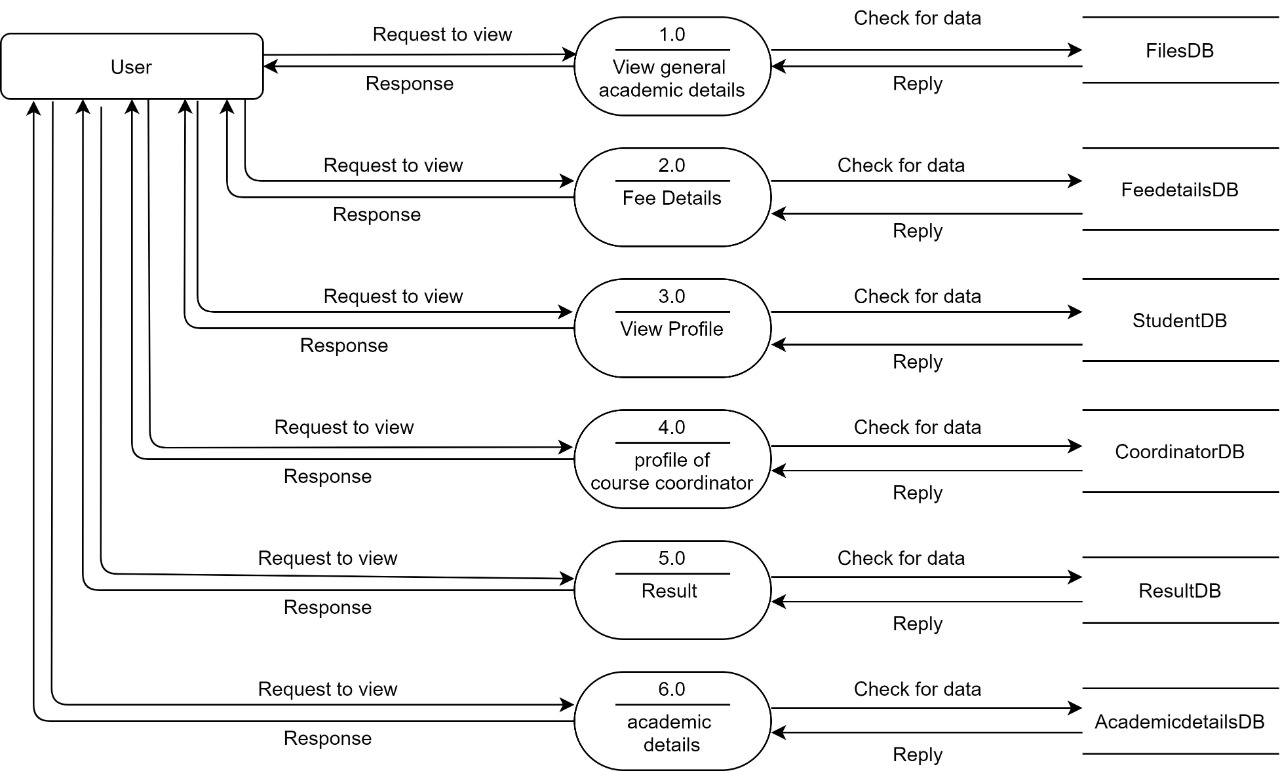
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**2.3. Data Flow Diagram**

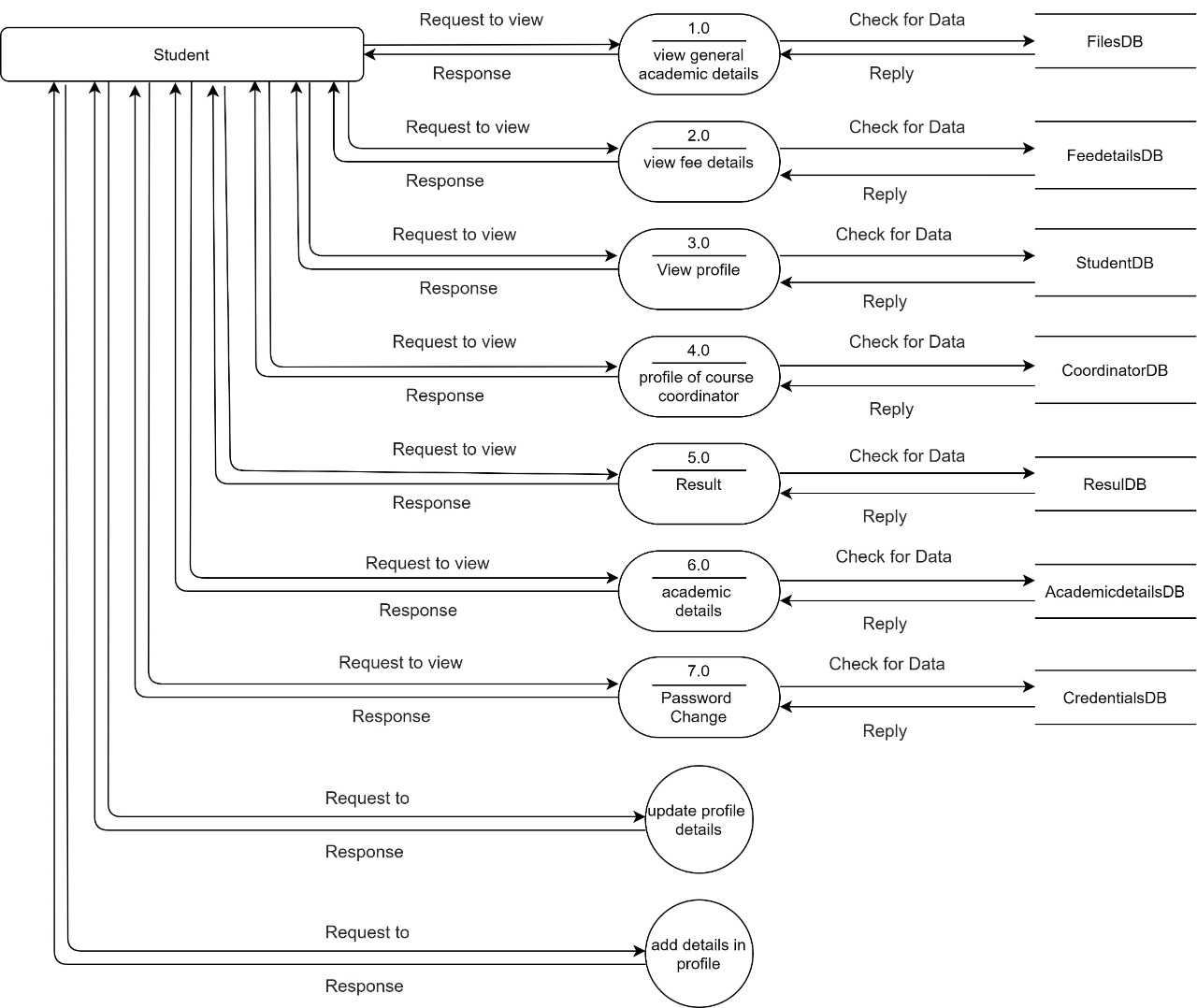
**2.3.1 LEVEL 0**

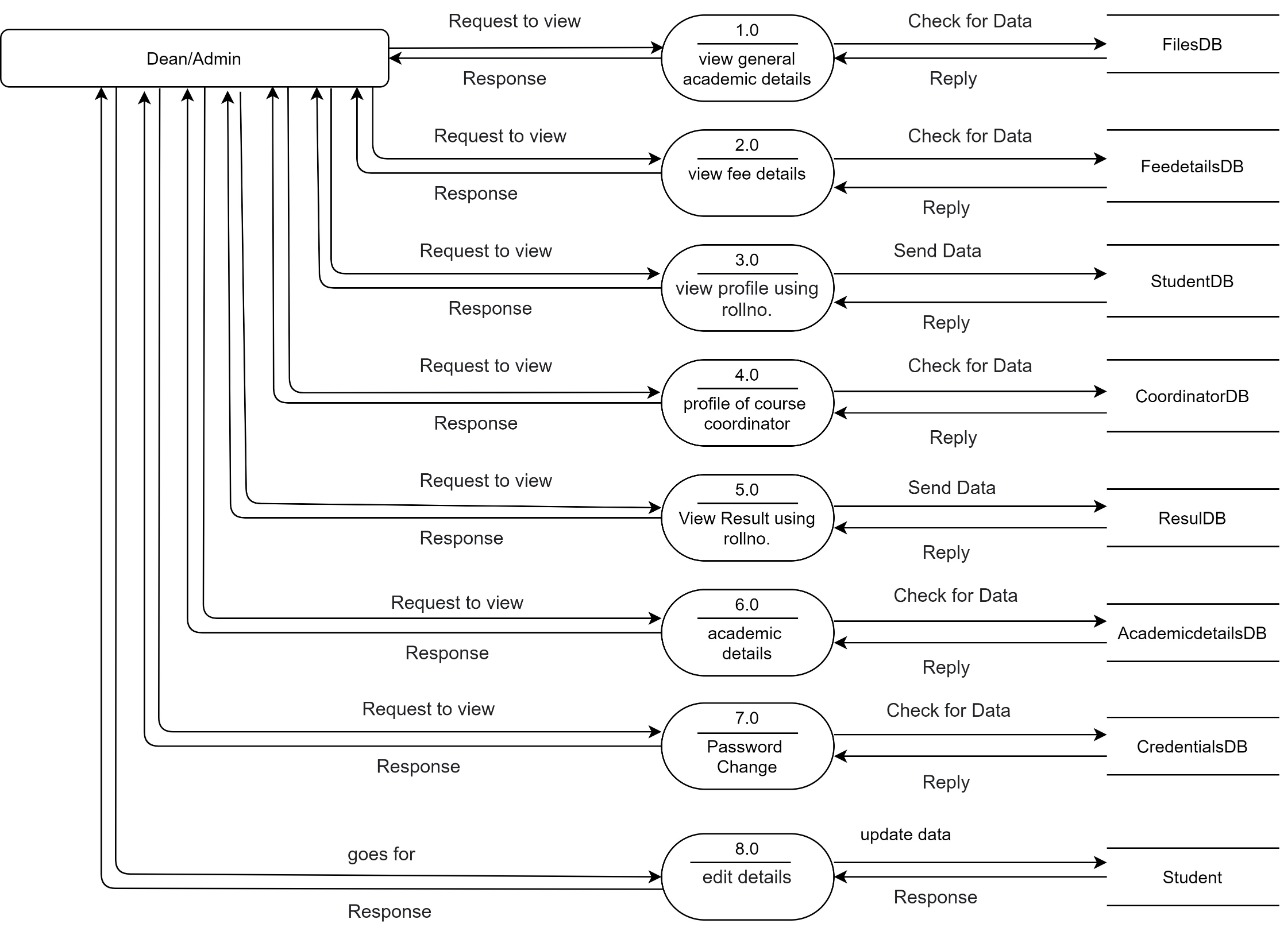
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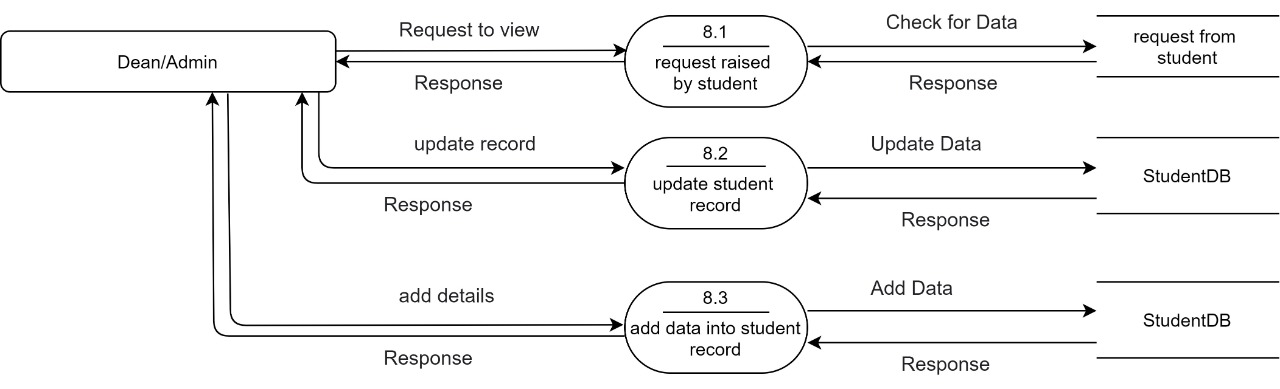
**2.3.2 LEVEL 1**

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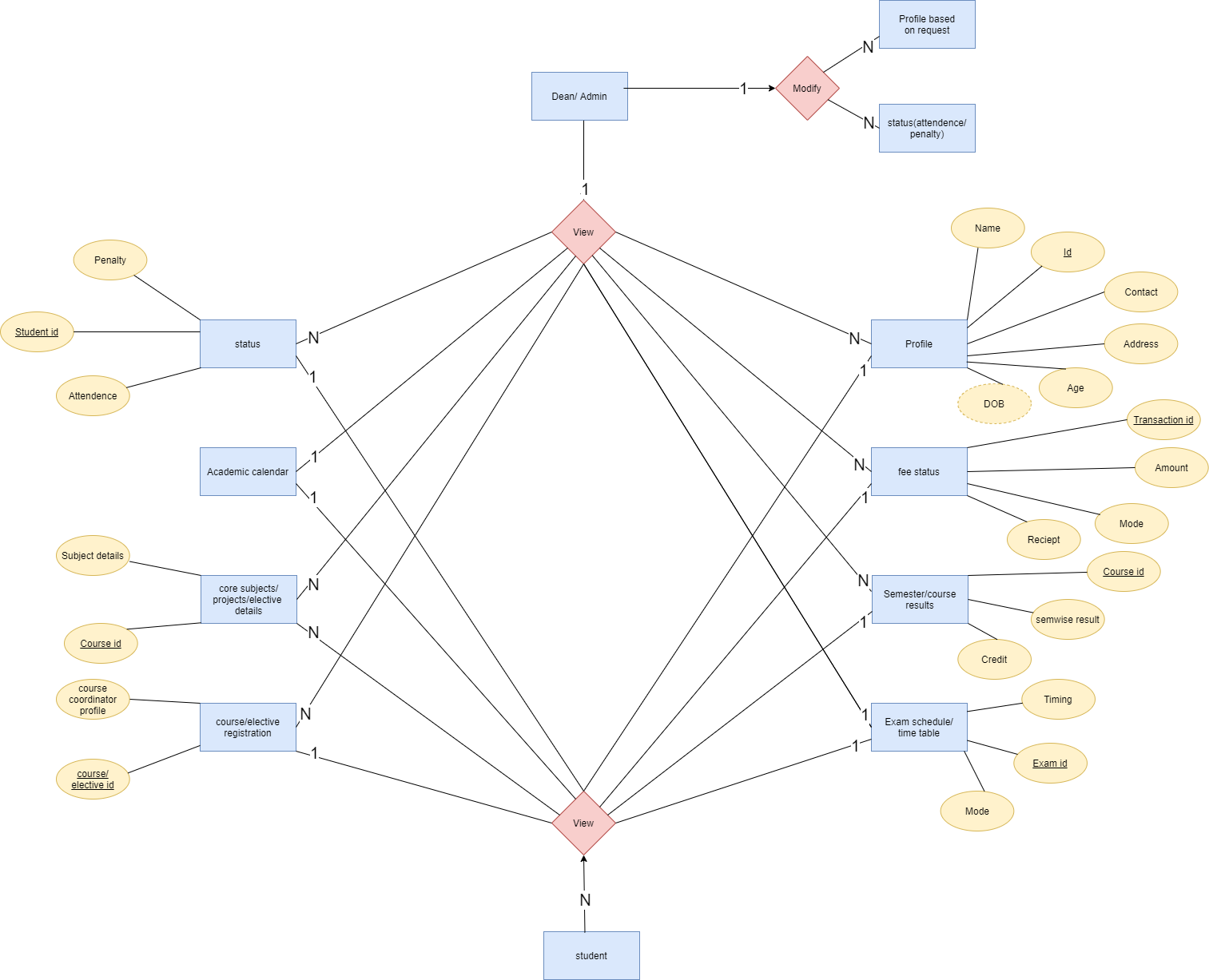
**2.3.3 LEVEL 2**

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**2.4. Entity Relationship Diagram**

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**3. Logical Architecture Description**

**3.1. State Diagram**

Initial state is being shown by starting with a black dot. Final State is being

shown by the black dot surrounded by an empty circle.

**3.1.1. Not yet logged in**: This is the starting page of the AMS where the student or the dean/ admin can enter the credentials to enter into the system and use it.

**3.1.2. Forgot/ change password**: In case the user is not able to remember his/her credentials, then he/she can click on ‘forgot password’ to retrieve the old password. On the other hand, if the user wants to change the password, then clicking on ‘change password’ will allow the user to change the credentials.

**3.1.3.** **Logged in**: After entering the credentials, the user is directed to another page where different options for viewing or modifying are present. Users can click any of the options according to the requirement.

**3.1.4. Academic Calendar**: Allows users to view the academic calendar for the current year of the IIIT-A Institute.

**3.1.5. Core subjects/ projects/ electives details**:Allows users to view the core subjects/ projects/ electives details for a particular student

**3.1.6. Course/ elective registration**: Allows users to view the course/ elective registration.

**3.1.7. Exam schedule/ Timetable**: Allows users to view the exam schedule/ timetable for the current semester.

**3.1.8. Status**: Allows users to view the status of the user such as attendance, dropped courses, penalty, etc.

**3.1.9. Profile:** Allows users to view their profile.

**3.1.10. Semester/ course results**: Allows users to view the semester / course results for a student.

**3.1.11. Appearing for examination**: Allows users to know whether he/ she is eligible to appear in the examination or not.

**3.1.12. Fee status**: Allows users to view the fee status of a student, whether he/she has done the fee payment or not.

**3.1.13. Logout:** When the user has done his/her task, then he/she can logout from their account by clicking on the ‘Logout’ option present at the top right corner of the window.

**3.2. Sequence Diagram**

UML Sequence Diagrams are interaction diagrams that detail how operations are carried out. They capture the interaction between objects in the context of a collaboration. Sequence Diagrams are time focus and they show the order of the interaction visually by using the vertical axis of the diagram to represent time what messages are sent and when.

**3.2.1 SEQUENCE DIAGRAM FOR ADMIN :-**

This is a sequence diagram for the Student Management System, where admin will be able to login in their account using their credentials. After login user can manage all the operations on Fees, Profiles, Exams, Courses, Student. All the pages such as Exams, Courses, Student are secure and user can access these page after login .The diagram below helps demonstrate how the login page work in a student management system . the courses , fee, profile, exams and student page-interact over the course of the sequence ,and user will not be able to access this page without verifying their identity.

**Profile:-** Can view the profile on any student and modify the profile on basis of request.

**Exams:-** Can view exam details of any student their attendance for exams

**Fees :-** Can view the status of fees of any student

**Academic details:-** Can view the courses, marks, electives, attendance of any student and any kind of penalty posted to him/her by any faculty.

**Result :-** Can view the result of any student.

**3.2.2 SEQUENCE DIAGRAM FOR STUDENT:-**

This is a sequence diagram for the Student Management System, where students will be able to login in their account using their credentials. After login users can view all the details on Fees, Profiles, Exams, Courses, Students. All the pages such as Exams, Courses, Students are secure and users can access these pages after login .The diagram below helps demonstrate how the login page works in a student management system . the courses , fee, profile, exams and student page-interact over the course of the sequence ,and the user will not be able to access this page without verifying their identity.

**Profile:-** Can view it’s own profile.

**Exams:-** Can view its own exam details and their attendance for exams

**Fees :-** Can view its own fee status and download it.

**Academic details:-** Can view the courses, marks, electives, attendance of any student and any kind of penalty posted to him/her by any faculty.

**Result :-** Can view its own result and download it.

**3.3. Data Flow Diagram**

**3.3.1. LEVEL 0**

Level 0 of data flow diagram is the basic outline of the software which only shows basic steps like from where data is fetched and where that data goes.

We show the different users who are already registered in our portal with all the process shown as Academic Management System (AMS) in between the users.

Two of our users are Dean/Admin and student.

Student have access for all the data to view and he/she can raise request for the update/edit in it’s own profile.Student can view only it’s own profile.

Dean/Admin have access to all the data and he/she can change the data in DB on the basis of request of student and he/she can view profile of any student.

3.3.1.1)- When the user launch the portal in suitable environment then one login screen appears which ask the user to enter it’s login credentials.

3.3.1.1.1)- The portal basic requirement is it’s unique id and the password registered in the db of portal.If the user forgets it then “Forgot Password” option is also implemented on the portal.

3.3.1.2)- When the user has completed it’s work on the portal then using the logout icon on top right of the screen ,user can logout from the portal.

3.3.1.2.1)- The logout from the portal is simple by clicking on one icon only and that automatically disconnects the user from the portal with all it’s work saved automatically.

3.3.1.3)- Whenever the user feels that the present password is no more able to prevent someone to enter the portal using it’s credentials.the user can change the password using change password feature.

**3.3.2 LEVEL 1**

Level 1 of data flow diagram is the diagram which defines in brief irrespective of user that from where data is coming and where the data is used in the progress.

In our data flow diagram for level 1, we show some basic steps like how the data is fetched from the management authority and how it is used in different processes.

3.3.2.1)- view general academic details:- The general academic details are the details which is common for both the student and the user. It basically contains some documents like academic calender,exam time table, transportation details etc.The source from where retrieve of data take place is FileDB or can be a folder which contains the required set of files.

3.3.2.2)- Fee details:- The fee details consists of the details related to fees and the DB connected to it is FeeDB.

3.3.2.3)-View Profile:- Using this feature of the portal the user get connected to StudentDB and can view the profile of student depending on user whether user is student or admin.

3.3.2.4)-Profile of course coordinator:- using this feature user get connected to CoordinatorDB and can view profile of coordinator.

3.3.2.5)-Result :- using this result feature the user get connected to resultDB and depending upon the rights of the user .User can view result.

3.3.2.6)-academic details:- this path connects to AcademicdetailsDB which contains all the academic details of all the registered students.

**3.3.3. LEVEL 2**

Level 2 of data flow diagram is the diagram which explains in briefly defines the flow of data for a particular user

*When the user is student*

First when the user launches the portal then he appears on the login screen.They need to enter their LDAP credentials in the input window. If they forget the password then he/she needs to take the "Forget Password" option for the OTP work and set the new password.If the password is wrong then the user navigates to the error window where they need to enter password again.

If the password and id entered by the user is correct then with the prompt message of "successful Login" and the user navigates to the home screen of portal.There they get all the facilities offered by the portal.

The facilities are:-

3.3.3.1)- view general academic details:- The general academic details are the details which is common for both the student and the user. It basically contains some documents like academic calender,exam time table, transportation details etc.The source from where retrieve of data take place is FileDB or can be a folder which contains the required set of files.

3.3.3.2)- Fee details:- The student can view it’s own fee status that whether it is paid or not

And download the fee receipt.

3.3.3.3)-View Profile:- Using this feature of the portal the user get can view it’s own profile and request to admin for 2 things ->

i)- can request the user to update any of it’s existing record.

ii)- can request the user to add any kind of detail like extra phone number etc.

3.3.3.4)-Profile of course coordinator:- The user can view details of course coordinator and all the contact details of the coordinator.

3.3.3.5)-Result :- The student can view only it’s own result and download it in form of PDF both semester wise and course wise.

3.3.3.6)-academic details:-The student can view only it’s own academic details like any kind of penalty posted by any faculty and attendance status etc.

3.3.3.7)- Change Password:- To change the password there is an OTP feature and u need to know the previous password also. For new password there were some restrictions like u cannot set old password as ur new password and you need to follow some rules to generate the new password like at last one special character etc.OTP is sent to the registered mail 2 times one before the process and one after the process. If any of the OTP does not match with the OTP sent to the mail.Then some action will be taken to maintain privacy of student.

*When the user is dean/admin*

First when the user launches the portal then he appears on the login screen.They need to enter their LDAP credentials in the input window. If they forget the password then he/she needs to take the "Forget Password" option for the OTP work and set the new password.If the password is wrong then the user navigates to the error window where they need to enter the password again.

If the password and id entered by the user is correct then with the prompt message of "successful Login" and the user navigates to the home screen of the portal.There they get all the facilities offered by the portal.

The facilities are:-

3.3.3.8)- view general academic details:- The general academic details are the details which is common for both the student and the user. It basically contains some documents like academic calender,exam time table, transportation details etc.The source from where retrieve of data take place is FileDB or can be a folder which contains the required set of files.

3.3.3.9)- Fee details:- The dean/admin can view the fee status of any student using the

Enrollment no.

3.3.3.10)-View Profile:- The dean/admin can view the profile that contains all the given personal information given by the student to college at the time of admission using only enrollment no. of student.

3.3.3.11)-Profile of course coordinator:- The dean/admin can view details of all course coordinators and all the contact details of the coordinator.

3.3.3.12)-Result :- The dean/admin can view only result of any student using their enrollment number.

3.3.3.13)-academic details:-The dean/admin can view only it’s own academic details like any kind of penalty posted by any faculty and attendance status etc of any student.

3.3.3.14)- Change Password:- To change the password there is an OTP feature and u need to know the previous password also. For new password there were some restrictions like u cannot set old password as ur new password and you need to follow some rules to generate the new password like at last one special character etc.OTP is sent to the registered mail 2 times one before the process and one after the process. If any of the OTP does not match with the OTP sent to the mail.Then some action will be taken to maintain privacy of dean/admin.

3.3.3.15)-Edit general details:- The dean/admin can edit exam schedule based on the scenario.

3.3.3.15.1)- The dean/admin can replace the exam schedule with the new pdf or doc file of the new document there is no OTP verification for this work.

3.3.3.16)-Edit status:- The dean/admin can edit the details of the student that is added to it’s profile during the semester.

3.3.3.16.1)- Any kind of penalty posted by the faculty to student or if he/she withdraw their name from any enrolled course. The dean/admin have rights to update all these kind of information on the portal.

3.3.3.17)- Edit profile:- The dean/admin on the basis of student’s request can update the profile of student

3.3.3.17.1)- If the student want to add some details or update some of it’s details due to any reason they can request to admin through the portal only and dean/admin have right to edit the student’s profile.

**3.4 Entity Relationship Diagram**

The student and the dean/admin are the two entities for the AMS system. These entities can view the following details:

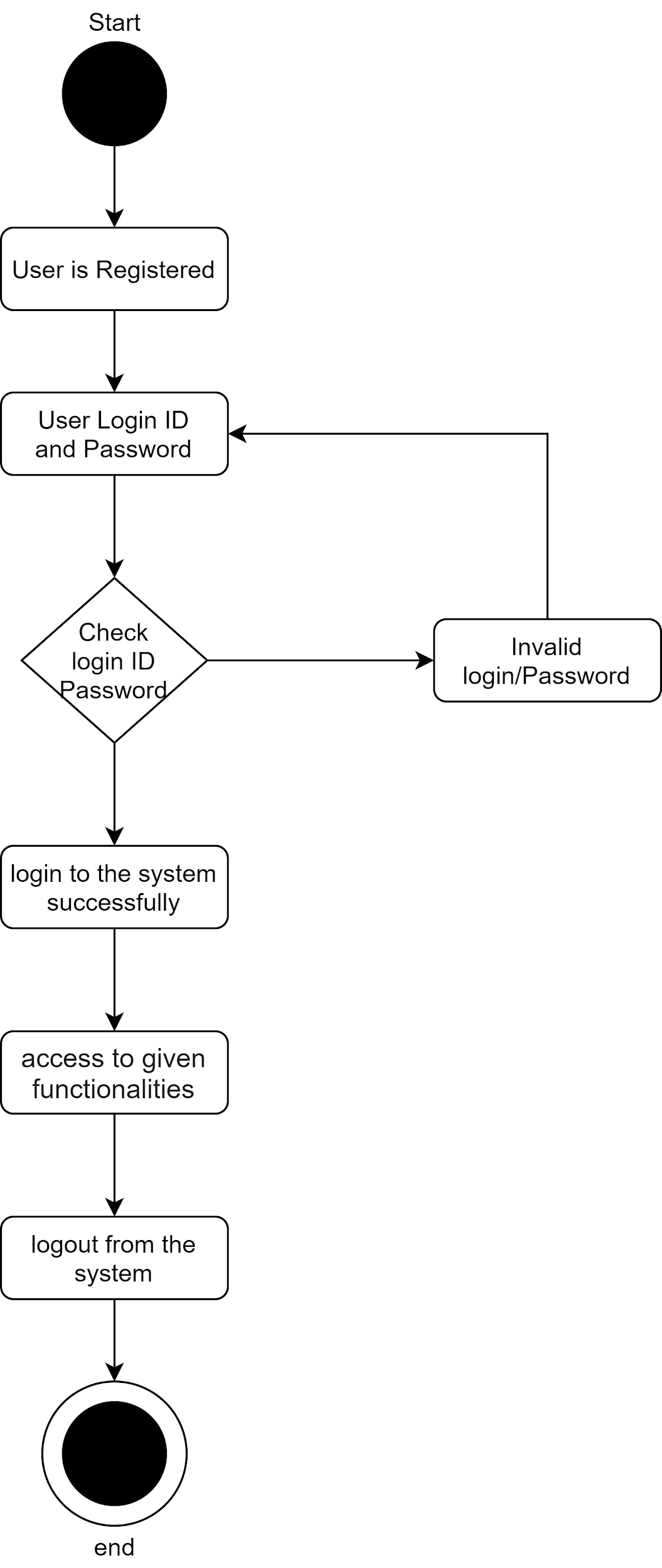
1. General academic details
   1. Class timetable
   2. Academic calendar
   3. Exam schedule
2. Results
   1. Semester-wise
   2. Course-wise
3. Academic status
4. Fee status
5. Core subject/electives/project details
6. Course coordinator
7. Course details
   1. Course registration
   2. Electives registration

However the modification of some of these attributes can be done only by the Dean/admin. These include:

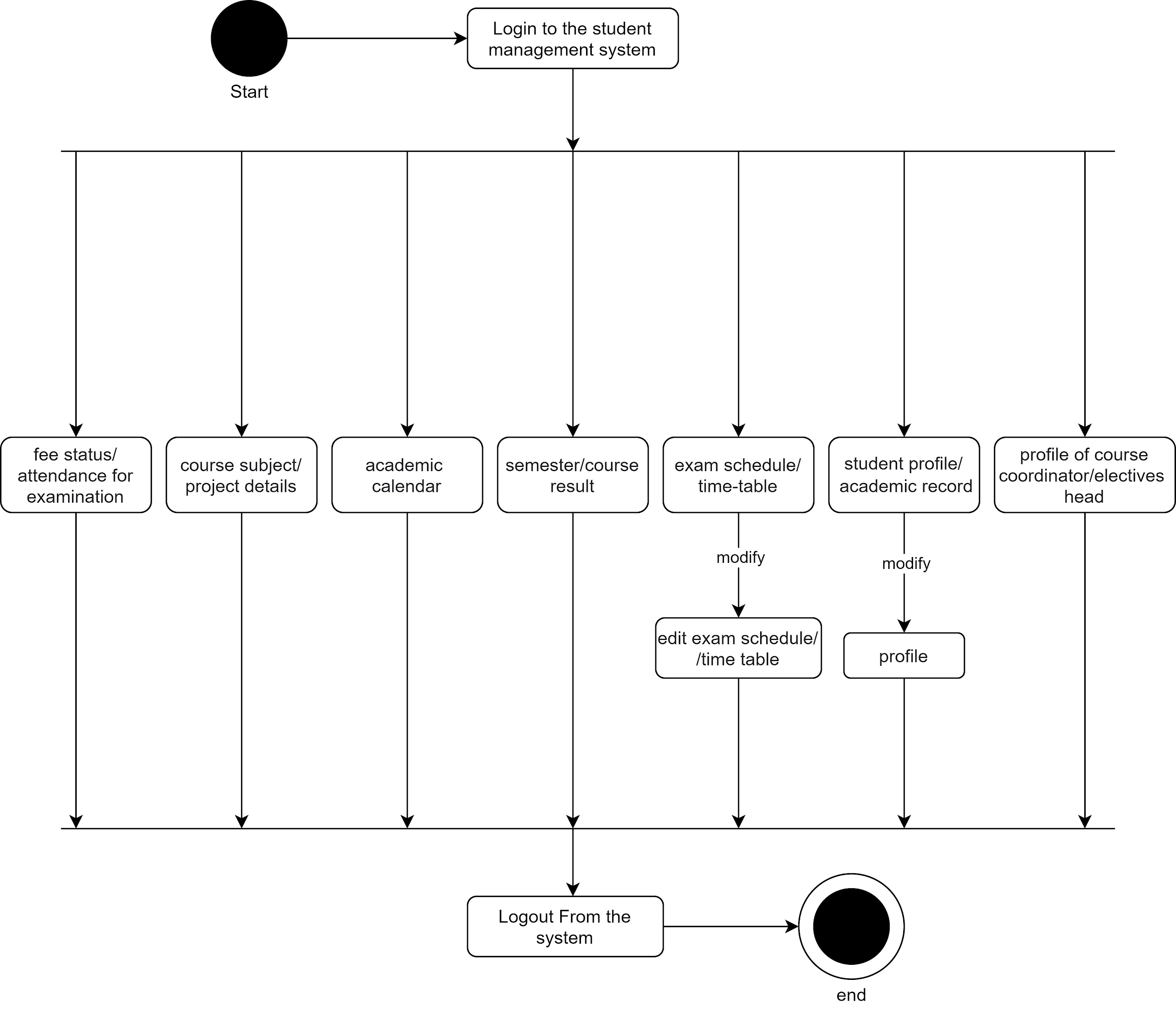
1. Status(Attendance/ dropped courses/penalty)
2. Exam schedule/timetable
3. Profile based on request

**4. Activity Diagram**

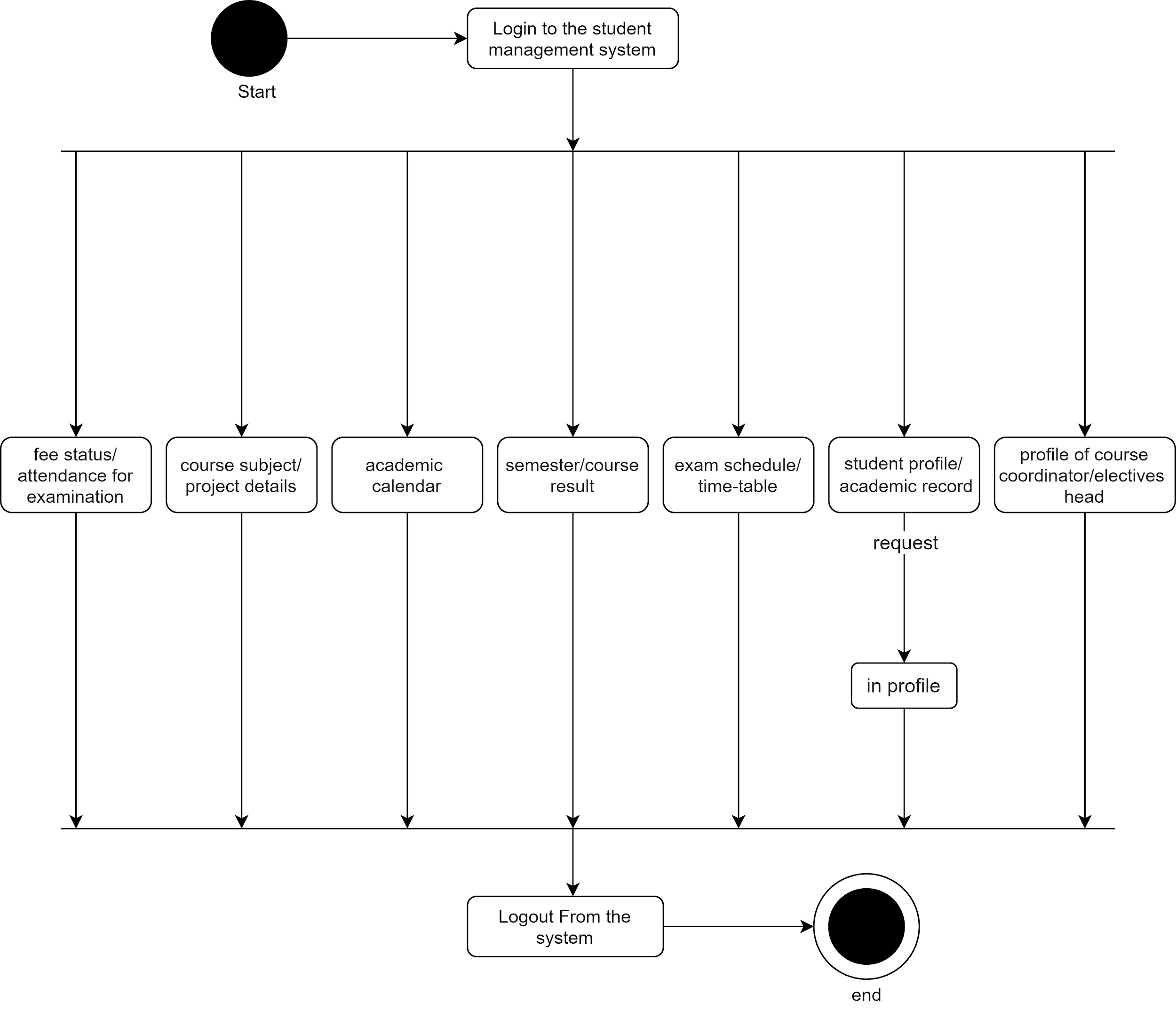
**4.1. Login Activity Diagram**

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**4.2. Dean/Admin Activity Diagram**

****

**4.3. Student Activity Diagram**

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**5. Pseudo Code**

**5.1. Pseudo Code for Login :-**

GET username

GET password

If(username== EnteredUsername && password==EnteredPassword) THEN

Login Successful

ELSE

Login Failed

If(option==”Forgot Password”)

OTP verification and new password process

ENDIF

-------------------------------------------------------------------------------------------------------------------------------

**5.2. Pseudo code for Dean/Admin :-**

Switch(selectedOption){

Case 1: View

switch(option){

Case 1:General academic details

GET academic calendar,exam time table,class time table

}

Case 2: Profile

switch(option){

Case 1:personal details

GET name,parent’s name,gender,dob,enrollment number,photo of selected student

Case 2: contact

GET phone number,email address,home address of selected student

Case 3:academic details

GET subjects,attendance status,any penalty,semester details of selected student

}

Case 3:Result

switch(option){

Case 1:exam attendance

GET exam attendance for all subjects of selected student

Case 2:subject wise result

GET subject wise result of all attempted and current semester of selected student

Case 3:semester wise result

GET cg of all the past semesters of selected student

Case 4:overall result

GET overall cg of selected student

}

Case 4:Fee

switch(option){

Case 1:fee status

GET fee status whether is is paid or not of selected student

Case 2:fee receipt

GET fee receipt in form of pdf of selected student

}

Case 5:Academic details

switch(option){

Case 1:view current subjects

GET details of current opted subject of selected student

Case 2: view current electives

GET details of current opted electives of selected student

}

Case 6:View profile of course coordinator

switch(option){

Case 1: view profile of course coordinator

GET profile of searched course coordinator of selected student

Case 2: view profile of elective head

GET profile of searched elective head of selected student

}

}

Case 2:Modify

switch(options){

Case 1: profile

UPDATE profile according to received request from student

Case 2:exam-schedule/time-table

UPDATE general details based on circumstances

Case 3:update marks

UPDATE semester wise marks

}

}

-------------------------------------------------------------------------------------------------------------------------------

**5.3. Pseudo code for Student :-**

Switch(selectedOption){

Case 1: View

switch(option){

Case 1:General academic details

GET academic calendar,exam time table,class time table

}

Case 2: Profile

switch(option){

Case 1:personal details

GET name,parent’s name,gender,dob,enrollment number,photo

REQUEST for modification for photo

SEND details to admin

Case 2: contact details

GET phone number,email address,home address

REQUEST for modification

SEND details to admin

REQUEST for add detail in profile

Case 3:academic details

GET subjects,attendance status,any penalty,semester details

}

Case 3:Result

switch(option){

Case 1:exam attendance

GET exam attendance for all subjects

Case 2:subject wise result

GET subject wise result of all attempted and current semester

Case 3:semester wise result

GET cg of all the past semesters

Case 4:overall result

GET overall cg

}

Case 4:Fee

switch(option){

Case 1:fee status

GET fee status whether is is paid or not

Case 2:fee receipt

GET fee receipt in form of pdf

}

Case 5:Academic details

switch(option){

Case 1:view current subjects

GET details of current opted subject

Case 2: view current electives

GET details of current opted electives .

}

Case 6:View profile of course coordinator

switch(option){

Case 1: view profile of course coordinator

GET profile of searched course coordinator

Case 2: view profile of elective head

GET profile of searched elective head

}

}

}

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