Database Management

SPMS 4.0

Group 26 – Team Halfdeads

Submitted By

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CHAPTER-1 INTRODUCTION

A. BACKGROUND OF THE ORGANIZATION - IUB:

Established in 1993, Independent University, Bangladesh (IUB) is the leading private university in Bangladesh with an explicit focus on research and global partnerships. With a current enrollment of around 10,000 at undergraduate and graduate levels, more than 450 highly qualified faculty members, 47% of whom have PhD degrees, and an alumni strength of close to 14,000, IUB is trying to ensure education all to promote the national agenda of sustainable inclusive development.[1]

The academic curriculum is based on the North American Liberal Arts Model and the medium of instruction is English. There are currently five academic schools: [1]

1) School of Business & Entrepreneurship

2) School of Engineering, Technology and Sciences

3) School of Environment & Life Sciences

4) School of Liberal Arts & Social Sciences

5) School of Pharmacy and Public Health

B. BACKGROUND OF THE PROJECT - SPMS 4.0:

A paradigm for outcome-based education is the Student Performance Monitoring System (SPMS 4.0). (OBE). It analyzes students, course instructor, school, department, and program performance and aids the higher authorities of the educational establishment in developing improvement strategies.

C. OBJECTIVE OF THE PROJECT - SPMS 4.0:

Through a database of assessments, including quizzes, midterm and final examinations, and other tests, SPMS 4.0 keeps track of and examines the performance of its stakeholders, including students, course instructors, departments, schools, and programs. The SPMS 4.0 database contains all the information needed to evaluate the performance of the stakeholders, including all exam question papers, answer scripts, course outlines, and marks for exams and assessments in relation to the Course Outcomes (CO), Program Learning Outcomes (PLO), and Program Outcomes (PO) attained by the students. Students can therefore statistically evaluate their own success. By giving Higher Authorities access to a variety of analytical reports based on student, course instructor, department, school, and program success, SPMS 4.0 also gives them the chance to make further improvements.

D. SCOPE OF THE PROJECT:

We thoroughly analyzed the current system (SPMS 3.0) and found some problems in the business processes that could make the process slow-moving, ineffective, and lead to communication breakdowns. The suggested remedy for those problems is to develop a better version of the system called SPMS 4.0 (Student Performance Monitoring System 4.0), which uses a Relational Database Management System (RDBMS) to store, update, and retrieve important documents like course outlines, exam question papers, and answer scripts, as well as other data required to monitor student performance and generate other OBE (outcome-Based Education) reports. All users of the system (SPMS 3.0) have been identified, along with information about how they will obtain the required data and information and interact with one another. We want to create user interfaces so that every user can access the data they need and use the system to create, examine, and download the reports and documents they want. Additionally, we want to create a platform that will enable faculty members to work together on creating course outlines, test questions, grade cards, and other materials. A new feature that determines the course outcome percentage based on the grades earned for each subject will also be implemented. Students and teachers will be able to view the calculated course outcome percentage through web application.

CHAPTER-2 REQUIREMENT ANALYSIS

Requirement Analysis is the process of determining what the database is used for. It involves interviews with stakeholders to identify the functionality and system requirements they expect and require from the database, what operations need to be performed and what data they need to process. By doing so, we can get a proper understanding of the stakeholders and how they interact with each other.

A. RICH PICTURE – EXISTING SYSTEM (SPMS 3.0):

A rich picture is a way to explore, acknowledge and define a situation and express it through diagrams to create a preliminary mental model and can help to open discussion and come to a broad, shared understanding of a situation.[3] A rich picture enables us to recognize connections and interactions that we might otherwise overlook. It aids in determining one or more themes that participants might wish to investigate and handle further. Rich pictures are thus always employed during the pre-analysis stage.

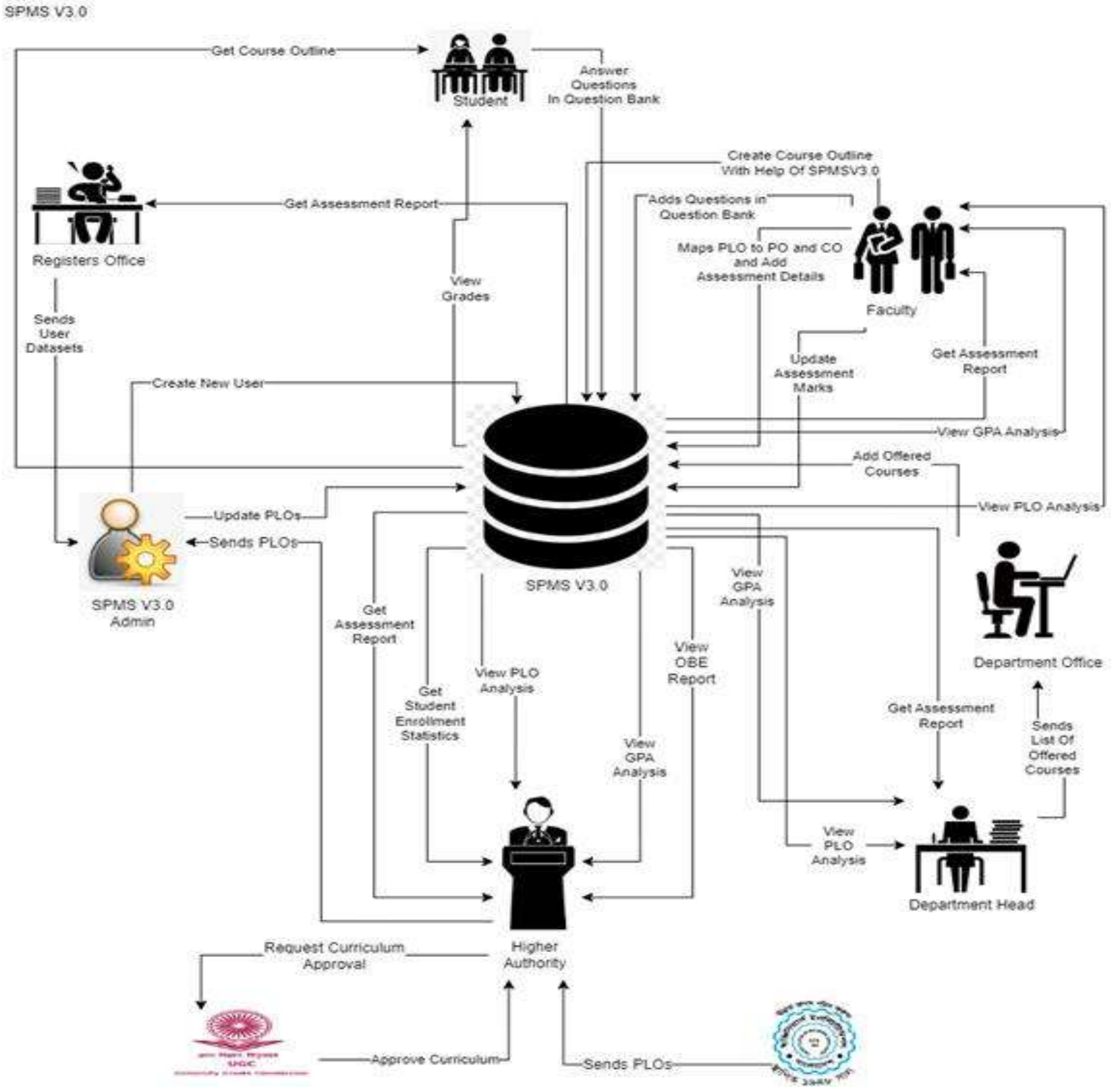


FIGURE 2.1: RICH PICTURE (AS IS)

In this rich picture the stakeholders are:

1) UGC
2) IEB
3) Higher Authority (VC, Dean etc.)
4) Department Head
5) Department Office
6) SPMSV3.0 Admin (SPMS Manager)
7) Registers Office
8) Faculty
9) Student

The Main Storage is:

1) SPMS V3.0

B. SIX ELEMENT ANALYSIS – EXISTING SYSTEM (SPMS 3.0):

From the rich picture we can see that there are 10 key processes:

1) **Creating storing and giving Course Outline**
2) **Add Questions to the question bank and grading the answer script**
3) **Course based student performance trend according to GPA**
4) **Faculty based student performance according to GPA**
5) **Course wise PLO achievement of a student**
6) **Student performance trend under VC/Dean/Head of Department**
7) **Course, Program, department, school CLO-PLO statistics**
8) **Course, student, department school wise expected vs achieved PLO**
9) **Department average of total PLO achieved and attempted students**
10) **Student Enrollment Statistics VC-wise, Dean-wise, Department Head-wise.**

We can use six element analysis to analyze the impact of six elements in a process here the six elements are:

A. Human

B. Non computing Hardware

C. Computing Hardware

D. Software.

E. Database.

F. Network and Communication.

Process	**Human**	**Non Computing Hardware**	**Computing Hardware**	**Software**	**Database**	**Network and Communication**
Preparing storing and giving Course Outline	**Faculty:** 1) Signs into System using their ID and Password. 2) Select Create Course Outline Tab. 3) Select From the options that they wish to add in their course outline. 4) Press the Create button. 5) Store course outline into system. **Students:** 1) Signs into System using their ID and Password. 2) Select Course 3)View/Download Course Outline from System.		**Computer/ Laptop** 1)Used to Sign into SPMS3.0 **Printer** 1) Used to print hard copy of course outlines if required.	**SPMS2. 0** 1)Used to store Data into the database	**SPMS 2.0 Database** 1) All valid data are stored here which can be updated by SPMS 2.0 admins.	**Internet** 1)Used to Sign into SPMS3.0
Add Questions to the question bank and grading the answer script	**Faculty:** 1) Signs into System using their ID and Password. 2) Select course and choose section's that has to solve the question.		**Computer/ Laptop** 1)Used to Sign into SPMS3.0 **Printer**	**SPMS3.0** 1)Used to store Data into the database or generate result	**SPMS 3.0 Database** 1)All valid data are stored here which can be updated by SPMS 3.0 admins.	**Internet** 1)Used to Sign into SPMS2.0

	3) Input the question in the question bank. 4) Press the Assign Button. 5) Grade the answers submitted by the students. **Student:** 1) Signs into System using their ID and Password. 2) Answer the question assigned by the faculty in the answer bank. 3) Press the Submit button. 4) Check grade in SPMS3.0 after faculty is done checking		1) Used to print the grades gotten by the whole	graph using data from the database		
Course based student performance trend according to GPA	**Department Head:** 1) Signs into System using their ID and Password. 2) Input the time period and course ID to be viewed. 3) View student progress through a graph made after analysis and the GPA earned by maximum/minimum/average students. **Faculty:** 1) Signs into system using their ID and Password. 2) Search for the course that they are teaching using course ID and time period and view the progress of that students of that course. **Student:** 1)Signs into System using their ID and Password. 2) Search for the course using		**Computer/ Laptop** 1)Used to Sign into SPMS2.0. **Printer** 1) Used to print hard copy of the progress of current semester's students and compare with the progress of the previous semester's students who did that course.	**SPMS3. 0** 1)Used to store student Data into the database or generate performance analysis graph using data from the database	**SPMS 3.0 Database** 1) All valid data are stored here which can be updated by SPMS 3.0 admins.	**Internet** 1)Used to Sign into SPMS3.0

	course ID and View their progress of that course and the GPA they earned. **Dean/VC :** 1) Signs into system using their ID and Password. 2) Search for the course using course ID and time period and view the progress of the students of that course.					
Faculty based student Performa-nce according to GPA	**Faculty:** 1)Signs into system using their ID and Password. 2) View the Progress of the students who are being taught by them. **Department Head:** 1)Signs into system using their ID and Password. 2) Search for a faculty to be assessed using the faculty's name. 3) View the Progress of the students who are being taught under that faculty basing on the GPA earned by the students. **Dean/VC:** 1) Signs into system using their ID and Password. 2) Search for a faculty to be assessed using the faculty's name and Department ID. 3) View the Progress of the students who are being taught under that faculty basing on the GPA earned by the students.		**Computer/ Laptop** 1)Used to Sign into SPMS3.0 **Printer** 1) Used to print hard copy of the progress of students taught by a faculty.	**SPMS3. 0** 1)Used to store student Data into the database or generate perform ance analysis graph using data from the database.	**SPMS 3.0 Database** 1) All valid data are stored here which can be updated by SPMS 3.0 admins.	**Internet** 1)Used to Sign into SPMS3.0

Course wise PLO achievement of a student	**VC/ Dean:** 1)Signs into system using their ID and Password. 2) Select PLO achievement Tab and search using Course ID 3) View PLOs achieved by the student. **Department Head:** 1)Signs into system using their ID and Password. 2) Select PLO achievement Tab and search using Course ID 3) View PLOs achieved by the students. **Faculty:** 1)Signs into system using their ID and Password. 2) Select PLO achievement Tab and search using Course ID 3) View PLOs achieved by the students in a course. **Student:** 1) Signs into system using their ID and Password. 2) View PLOs they have achieved so far and how many they need to achieve to complete the course.		**Computer/ Laptop** 1)Used to Sign into SPMS3.0 **Printer** 1) Used to print hard copy of a report of students who completed most the PLO achievements If needed.	**SPMS3. 0** 1)Used to store Data and generate PLO automatically based on the CO provided.	**SPMS 3.0 Database** 1) All valid data are stored here which can be updated by SPMS 3.0 admins.	**Internet** 1)Used to Sign into SPMS3.0
Student performance trend under VC/Dean/ Head of Department	**Dean** : 1) Signs into system using their ID and Password. 2) Search for Department Head to be checked using their Name and Department ID. 3) View student progress under them or them. **VC:** 1)Signs into system using their		**Computer/ Laptop** Used to Sign into SPMS3.0 **Printer** 1) Used to print the hard copy of the progress report if needed	**SPMS3. 0** 1)Used to store Data into the database or generate performance analysis graph using data from	**SPMS 3.0 Database** 1) All valid data are stored here which can be updated by SPMS 3.0 admins.	**Internet** 1)Used to Sign into SPMS3.0

	ID and Password. 2) Search for a Dean or Department Head to be checked using their Name and either School ID or Department ID. 3) View student progress under them. **Department Head:** 1) Signs into system using their ID and Password. 2) View student progress under them.			the database		
Course, Program, department, school CLO-PLO statistics	**Dean/VC :** 1) Signs into system using their ID and Password. 2) View CLO-PLO mapped statistics achieved by students. **Department Head:** 1) Signs into system using their ID and Password. 2) View CLO-PLO mapped statistics achieved by students. **Faculty:** 1)Signs into system using their ID and Password. 2) View CLO-PLO mapped statistics achieved by students. **Student:** 1) Signs into system using their ID and Password. 2) View CLO-PLO mapped statistics achieved by them and other students.		**Computer/ Laptop** 1) Used to Sign into SPMS3.0 **Printer** 1) Used to print the hard copy of the progress report if needed	**SPMS3. 0** 1)Used to store Data into the database and generate CLO-PLO statistical data or graphs.	**SPMS 3.0 Database** 1)All valid data are stored here which can be updated by SPMS 3.0 admins.	**Internet** 1)Used to Sign into SPMS3.0
Course, student, department school wise	**Dean/VC :** 1)Sign into the system using ID and Password. 2) View the achieved PLO of the		**Computer/ Laptop** Used to Sign into SPMS3.0	**SPMS3. 0** 1)Used to store Data into the	**SPMS 3.0 Database** **1)** All valid data are stored here which can be	**Internet** 1)Used to Sign into SPMS2.0

expected vs achieved PLO	students during time entered which is inputted and comparison between expected and achieved. **Department Head:** 1) Sign into the system using ID and Password. 2) View the achieved PLO of the students during time entered that has been inputted and comparison between expected and achieved. **Faculty:** 1) Sign into the system using ID and Password. 2) View the achieved PLO of the students during time entered that has been inputted and comparison between expected and achieved. **Student:** 1) Sign into the system using ID and Password. 2) View the achieved PLO of the students during time entered that has been inputted and comparison between expected and achieved.		**Printer** 1) Used to print the hard copy of both the previous and current semester's achieved PLO to compare.	database or generate performance analysis graph using data from the database.	updated by SPMS 2.0 admin s	
Department average of total PLO achieved and attempted students	**Dean/VC :** 1)Sign into the system using ID and Password. 2) Enter the time period of the semester wished to be viewed. 3) View the departmental average of total PLO achieved		**Computer/ Laptop** 1) Used to Sign into SPMS3.0 Printer 1) Used to print the hard	**SPMS3. 0** 1)Used to store Data into the database or generate performance analysis	**SPMS 3.0 Database** 1) All valid data are stored here which can be updated by SPMS 3.0 admins.	**Internet** 1)Used to Sign into SPMS3.0

	along with the number of students who attempted. **Department Head:** 1) Sign into the system using ID and Password. 2) Enter the time period of the semester wished to be viewed. 3) View the departmental average of total PLO achieved along with the number of students who attempted. **Faculty:** 1) Sign into the system using ID and Password. 2) View the total departmental average of the PLO achieved by the students. **Student:** 1) Sign into the system using ID and Password. 2) View the total departmental average of the PLO achieved by the students		copy of PLO reports	graph using data from the database		
Student Enrollment Statistics VC-wise, Dean-wise, Department Head-wise.	**VC:** 1) Sign into the system using ID and Password. 2) Select Student Enrollment Statistics tab and select Year and Semester under that tab 3) View Student Enrollment Statistics of That Year and Semester. **Dean:**		**Computer/ Laptop** 1) Used to Sign into SPMS3.0 **Printer** 1) Used to print the hard copy of Student Enrollment Statistics If Needed.	**SPMS3. 0** 1)Used to store Data into the database and generate Student Enrollment Statistics graphs.	**SPMS 3.0 Database** 1) All valid data are stored here which can be updated by SPMS 3.0 admins.	**Internet** 1)Used to Sign into SPMS3.0

	1)Sign into the system using ID and Password. 2) Select Student Enrollment Statistics tab and select Year and Semester under that tab 3) View Student Enrollment Statistics of That Year and Semester. **Department Head:** 1) Sign into the system using ID and Password. 2) Select Student Enrollment Statistics tab and select Year and Semester under that tab 3) View Student Enrollment Statistics of That Year and Semester.					

C. PROBLEM ANALYSIS – EXISTING SYSTEM (SPMS 3.0):

The problems in SPMS3.0 were analyzed, and the proposed solution are given in the following.

Process Name	Stake Holders	Concerns(Problems)	Analysis(Reason of the problem)	Proposed Solution
Course, Program, department, school CLO-PLO statistics	**Dean/VC, Department Head, Faculty, Student**	Calculating Course Outcome based on student grades.	1)Unreliable storage 2)Change of pattern in student Grading	We can add new data fields to the existing web application to allow the calculation of course. outcomes based on student Grade. The user will be able to input the data using a manual form and also can import a csv file from which the data points can be extracted and inputted into the database. Specifically, students and faculty can view the calculated course outcome percentage through the web application.
Enter Backlog Data	**Faculty, Student**	Entering Course grade of previous students	1)Storing Data from Past 2)Data Security	Faculties can add grade of previous semester which will be stored in the DBMS. Students can see their respective grades and CO percentage from those grades.

D. RICH PICTURE – PROPOSED SYSTEM(SPMS4.0):

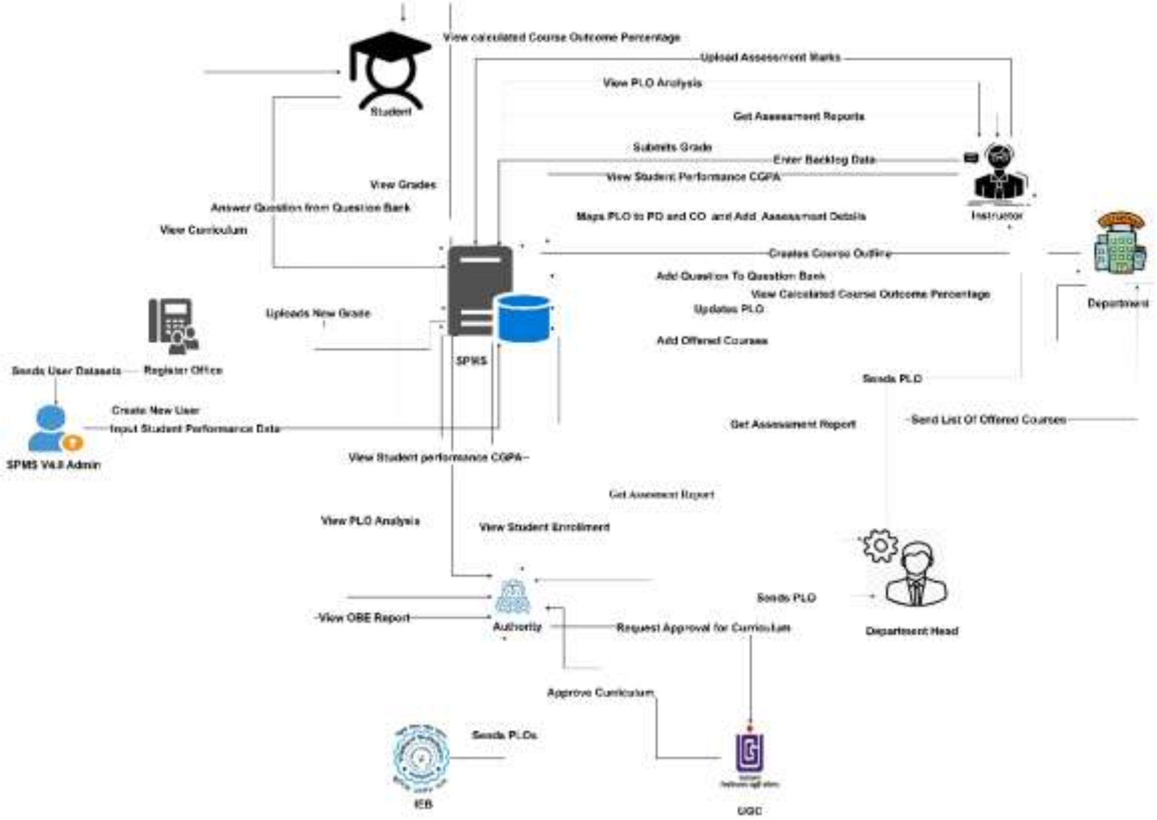


FIGURE 2.2: RICH PICTURE (TO BE)

In this rich picture the stakeholders are:

1) UGC

2) IEB

3) Higher Authority (VC, Dean etc.)

4) Department Head

5) Department Office

6) SPMSV4.0 Admin (SPMS Manager)

7) Registers Office

8) Faculty

9) Student

The Main Storage is

1) SPMS V4.

E. SIX ELEMENT ANALYSIS – PROPOSED SYSTEM (SPMS 4.0):

From the rich picture we can see that there are 10 key processes:

1) **Course based student performance trend according to GPA.**
2) **Instructor based student performance according to GPA**
3) **Course wise PLO achievement of a student**
4) **Student performance trend under VC/Dean/Head of Department**
5) **Course, Program, department, school CLO-PLO statistics**
6) **Course, student, department school wise expected vs achieved PLO.**
7) **Department average of total PLO achieved and attempted students.**
8) **Student Enrollment Statistics VC-wise, Dean-wise, Department Head-wise**
9) **Add Questions to the question bank and grading the answer script.**
10) **Preparing storing and giving Course Outline**
11) **Calculated Course Outcome Percentage from Backlog Data Student-wise, Faculty-wise.**

We can use six element analysis to analyze the impact of six elements in a process here the six elements are:

1. Human

2. Non computing Hardware

3. Computing Hardware

4. Software.

5. Database.

6. Network and Communication.

Process	**Human**	**Non-computing Hardware**	**Computing Hardware**	**Software**	**Database**	**Network and Communication**
Course based student performance trend according to GPA	**Department Head:** 1)Signs into System using their ID and Password. 2) Input the time period and course ID to be viewed. 3) View student progress through a graph made after analysis and the GPA earned by		**Computer/ Laptop:** 1) Used to Sign into SPMS 4.0. **Printer / Scanning Machine:**	**SPMS4.0 :** 1)Used to store student Data into the database or generate	**SPMS4.0 Database:** 1) All valid data are stored here	**Internet:** 1)Used to Sign into SPMS4.0

	maximum/minimum/average students. **Faculty:** 1)Signs into system using their ID and Password. 2) Search for the course that they are teaching using course ID and time period and view the progress of that students of that course. **Student:** 1) Signs into System using their ID and Password. 2) Search for the course using course ID and View their progress of that course and the GPA they earned. **Dean/VC:** 1) Signs into system using their ID and Password.		1) Used to print hard copies of the progress report of current and previous semesters of students.	performance analysis graph using data from the database	which can be updated by SPMS 4.0 admins.	
Faculty based student performance according to GPA	**Faculty:** 1) Signs into system using their ID and Password. 2) View the Progress of the students who are being taught by them. **Department Head:** 1) Signs into system using their ID and Password. 2) Search for a faculty to be assessed using the faculty's name. 3) View the Progress of the students who are being taught under that faculty basing on the GPA earned by the students. **Dean/VC:** 1) Signs into system using their ID and Password. 2) Search for a faculty to be assessed using the faculty's name and Department ID. 3) View the Progress of the students who are being taught under that faculty basing on the GPA earned by the students.		**Computer/Laptop:** 1) Used to Sign into SPMS 4.0. **Printer / Scanning Machine:** 1) Used to print hard copies of the progress report of current and previous semesters of students.	**SPMS4.0:** 1)Used to store student Data into the database or generate performance analysis graph using data from the database	**SPMS4.0 Database:** 1) All valid data are stored here which can be updated by SPMS 4.0 admins.	**Internet:** 1)Used to Sign into SPMS4.0

Course wise PLO achievement of a student	**VC:** 1) Signs into system using their ID and Password. 2) Select PLO achievement Tab and search using Course ID 3) View PLOs achieved by the student. **Department Head:** 1) Signs into system using their ID and Password. 2) Select PLO achievement Tab and search using Course ID 3) View PLOs achieved by the students. **Faculty:** 1) Signs into system using their ID and Password. 2) Select PLO achievement Tab and search using Course ID 3) View PLOs achieved by the students in a course. **Student:** 1) Signs into system using their ID and Password. 2) View PLOs they have achieved so far and how many they need to achieve to complete the course.		**Computer/ Laptop** 1) Used to Sign into SPMS4.0 **Printer** 1) Used to print hard copy of a report of students who completed most the PLO achievements If needed.	**SPMS4.0** 1)Used to store Data and generate PLO automatically based on the CO provided	**SPMS4.0 Database** 1) All valid data are stored here which can be updated by SPMS4.0 admins.	**Internet** 1)Used to Sign into SPMS4.0
Student performance trend under VC/Dean/Head of Department	**VC:** 1) Signs into system using their ID and Password. 2) Search for Dean or Department Head to be checked using their Name and either School ID or Department ID. 3) View student progress under them or them. **Department Head:** 1) Signs into system using their ID and Password. 2) View student progress under them. **Dean :**		**Computer/ Laptop** 1) Used to Sign into SPMS4.0 **Printer** 1) Used to print the hard copy of the progress report if needed.	**SPMS4.0** 1)Used to store Data into the database or generate performance analysis graph using data from the database.	**SPMS4.0 Database** 1) All valid data are stored here which can be updated by SPMS4.0 admins.	**Internet** 1)Used to Sign into SPMS4.0

	1) Signs into system using their ID and Password. 2) Search for Department Head to be checked using their Name and Department ID. 3) View student progress under them or them.					
Course, Program, department , school CLO-PLO statistics	**Dean/VC:** 1) Signs into system using their ID and Password. 2) View CLO-PLO mapped statistics achieved by students. **Department Head:** 1) Signs into system using their ID and Password. 2) View CLO-PLO mapped statistics achieved by students. **Faculty:** 1) Signs into system using their ID and Password. 2) View CLO-PLO mapped statistics achieved by students. **Student:** 1) Signs into system using their ID and Password. 2) View CLO-PLO mapped statistics achieved by them and other students.		**Computer/ Laptop** 1) Used to Sign into SPMS4.0 **Printer** 1) Used to print the hard copy of the progress report if needed.	**SPMS4.0** 1)Used to store Data into the database and generate CLO-PLO statistical data or graphs.	**SPMS4.0 Database** 1) All valid data are stored here which can be updated by SPMS4.0 admins.	**Internet** 1)Used to Sign into SPMS4.0
Course, student, department school wise expected vs achieved PLO	**VC/Dean:** 1) Sign into the system using ID and Password. 2) View the achieved PLO of the students during time entered that has been inputted and comparison between expected and achieved. **Department Head:** 1) Sign into the system using ID and Password. 2) View the achieved PLO of the students during time entered that has been inputted and comparison between expected and achieved.		**Computer/ Laptop** 1) Used to Sign into SPMS4.0 **Printer** 1) Used to print the hard copy of both the previous and current semester's achieved PLO to compare.	**SPMS4.0** 1)Used to store Data into the database or generate performance analysis graph using data from the database	**SPMS4.0 Database** 1) All valid data are stored here which can be updated by SPMS4.0 admins.	**Internet** 1)Used to Sign into SPMS4.0

	Instructor: 1) Sign into the system using ID and Password. 2) View the achieved PLO of the students during time entered that has been inputted and comparison between expected and achieved. **Student:** 1) Sign into the system using ID and Password. 2) View the achieved PLO of the students during time entered that has been inputted and comparison between expected and achieved.					
Department average of total PLO achieved and attempted students	**Dean/VC:** 1) Sign into the system using ID and Password. 2) Enter the time period of the semester wished to be viewed. 3) View the departmental average of total PLO achieved along with the number of students who attempted. **Department Head:** 1) Sign into the system using ID and Password. 2) Enter the time period of the semester wished to be viewed. 3) View the departmental average of total PLO achieved along with the number of students who attempted. **Faculty:** 1) Sign into the system using ID and Password. 2) View the total departmental average of the PLO achieved by the students. **Student:** 1) Sign into the system using ID and Password. 2) View the total departmental average of the PLO achieved by the students		**Computer/Laptop** 1) Used to Sign into SPMS4.0 **Printer** 1) Used to print the hard copy of PLO reports	**SPMS4.0** 1)Used to store Data into the database or generate performance analysis graph using data from the database	**SPMS4.0 Database** 1) All valid data are stored here which can be updated by SPMS4.0 admins.	**Internet** 1)Used to Sign into SPMS4.0

Add Questions to the question bank and grading the answer script	**Faculty:** 1)Signs into System using their ID and Password. 2) Select course and choose section's that has to solve the question. 3) Input the question in the question bank. 4) Press the Assign Button. 4) Grade the answers submitted by the students. **Student:** 1) Signs into System using their ID and Password. 2) Answer the question assigned by the faculty in the answer bank 3) Press the Submit button 4) Check grade in SPMS4.0 after faculty is done	**Pen and Paper** 1)Can be Used to create Rough assessment questions. 2) Used to answer assessment questions.	**Computer/ Laptop** 1)Used to Sign into SPMS4.0 **Printer** 1) Used to print the grades gotten by the whole section	**SPMS4.0** 1)Used to store Data into the database or generate result graph using data from the database	**Physical Storage** 1)Used for Storing all the answer scripts returned by students	**Internet** 1) Used to Sign into Google Classroom if communication is required. 2)Used to Sign into SPMS4.0
Student Enrollment Statistics Authority wise, Department Head-wise.	**VC** 1)Sign into the system using ID and Password. 2) Select Student Enrollment Statistics tab and select Year and Semester under that tab 3) View Student Enrollment Statistics of That Year and Semester. **Dean** 1) Sign into the system using ID and Password. 2) Select Student Enrollment Statistics tab and select Year and Semester under that tab 3) View Student Enrollment Statistics Of That Year and Semester. **Department Head** 1) Sign into the system using ID and Password. 2) Select Student Enrollment Statistics tab and select Year and Semester under that tab 3) View Student Enrollment Statistics of That Year and Semester.		**Computer/ Laptop** 1) Used to Sign into SPMS4.0 **Printer** 1) Used to print the hard copy of Student Enrollment Statistics If Needed.	**SPMS4.0** 1)Used to store Data into the database and generate Student Enrollment Statistics graphs.	**SPMS4.0 Database** 1) All valid data are stored here which can be updated by SPMS4.0 admins.	**Internet** 1)Used to Sign into SPMS4.0

Preparing and storing Course Outline	**Instructor:** 1)Signs into System using their ID and Password. 2) Select Create Course Outline Tab. 3) Select From the options that they wish to add in their course outline. 4) Press the Create button. 5) Store course outline into system. **Students:** 1) Signs into System using their ID and Password. 2) Select Course 3)View/Download Course Outline from System.		**Computer/ Laptop** 1) Used to Sign into SPMS4.0 **Printer** 1) Used to print hard copy of course outlines if required	**SPMS4.0** 1)Used to store Data into the database	**SPMS4.0Database** 1) All valid data are stored here which can be updated by SPMS 4.0 admins.	**Internet** 1)Used to Sign into SPMS4.0
Calculated Course Outcome Percentage From Backlog Data Student-wise, Faculty-wise.	**Faculty:** 1)Signs into System using their ID and Password. 2) Select Calculated course outcome percentage. 3) Select Educational year, Educational semester, Enrolled course from the options. **Student:** 1)Signs into System using their ID and Password. 2) Select Calculated course outcome percentage. 3) Select Educational year, Educational semester, Enrolled course, Enrolled section from the options. **SPMS4.0 Admin:** 1)Signs into System using their ID and Password. 2) Input previous student data. 3) Select calculate course outcome percentage. 3) Input required data. Press “Convert CO from Grade”. Press “SAVE” to save the new data.		**Computer/ Laptop** 1) Used to Sign into SPMS4.0 **Printer** 1) Used to print hard copy of calculated CO	**SPMS4.0** 1)Used to store Data into the database	**SPMS4.0Database** 1) All valid data are stored here which can be updated by SPMS 4.0 admins	**Internet** 1)Used to Sign into SPMS4.0

CHAPTER-3 LOGICAL SYSTEM DESIGN

A. BUSINESS RULES – SPMS4.0

1. A student must have one department. A STUDENT has studentID, FirstName, LastName, dateOfBirth, gender, email, phone, address, departmentID, programID, enrollmentYear, enrollmentSemester, password. A department must have one or many Students.
2. Student may perform many registrations. REGISTRATION includes registrationID, sectionID, studentID. A registration must be performed by at least one student.
3. A section mandatorily have many registrations. A registration has at least one section. A section includes sectionID, sectionNum, courseID, facultyID, semester, year.
4. A registration may belong to many EVALUATIONS. An evaluation must belong to one registration. An EVALUATION contains evaluationID, examID, registrationID, totalMarks.
5. A CO must map with one PLO. A PLO's must map with one or many CO's. PLO includes ploID, ploNum, programID.
6. A PLO must contain one program. A program contains one or many PLO's. A PROGRAM has programID, programName, departmentID. A program must contain one or many courses. A Course must contain one course.
7. A program must belong to one department. A department must belong to one or many programs. A DEPARTMENT contains departmentID, departmentName, schoolID.
8. A department must contain one school. A SCHOOL must contain one or many departments. A school includes schoolID, schoolName.
9. An employee has four sub-type(Dean, Department Head, Faculty, VC). An EMPLOYEE includes employeeID,password, firstName, lastName.
10. A school must be run by exactly one. A dean must run exactly one school. A DEAN has schoolID, startDate, endDate.
11. A Department must be run by exactly one Department head. A department head must manage exactly one department. A DEPARTMENTHEAD includes departmentID, startDate, endDate.
12. A Faculty must have exactly one Department. A department must have one or many Faculties. A FACULTY includes departmentID, rank, joinDate. A faculty may teach many sections. A section must be taught by exactly one faculty
13. A courseOutline belongs to exactly one section. A section must have exactly one course outline. A COURSE_OUTLINE includes courseOutlineID, sectionID, contactHours, courseDescription,objective,content,refMaterials,courseType,courseTitle,creditValue,prerequisiteCode.
14. A Course outline must have exactly one CLO Matrix. A CLO matrix belongs to exactly one course outline. A CLO_MATRIX includes clo_MatID, cloNum, coDescription, ploAssessed, correlation, courseOutlineID , c ,p ,a ,s.

15. A Lesson Plan Strategy must have exactly one Evaluation strategy. An Evaluation strategy must have exactly one Lesson Plan Strategy .A LESSON_PLAN_STRATEGY includes lPSID ,week ,topic ,learningStrategy , assessmentStrategy, correspondingClo, courseOutlineID.
16. An exam has exactly one evaluation. An Evaluation for an exam is done exactly once. An exam belongs to exactly one section. An EXAM includes examID, examName, sectionID. A section must have one or many exams.
17. An exam must have one or many questions. Every question must belong to exactly one exam. A QUESTION includes questionID , questionDetails , marksPerQuestion , questionNum , difficutltyLevel , examID , coNum. A Question is answered exactly once. An answer has exactly one question.
18. A PO belongs to exactly one program A program must have one or many PO.PO includes poID , poNum , programID. A PO must belong to one or many CO. A CO must have exactly one PO.
19. A student course performance evaluation is done for registration exactly once. A registration has student course performance done exactly once. A registration has only one evaluation. An Evaluation has exactly one registration. registrationID, scpID, gradePoint ,totalMarksObtained included in COURSE_STUDENT_PERFORMACE.
20. A CO belongs to exactly one course. A course must have one or many CO. CO includes coID, coNum, courseID, ploID, poID, Student ID.
21. A Backlog_data belongs to exactly one student. A student can have multiple Backlog Data. BACKLOG_DATA includes backlogID,edu_year,edu_semester, enrolled_course,enrolled_section,time_stamp,obtained_marks, obtained_grades.

B. ENTITY RELATIONSHIP DIAGRAM:

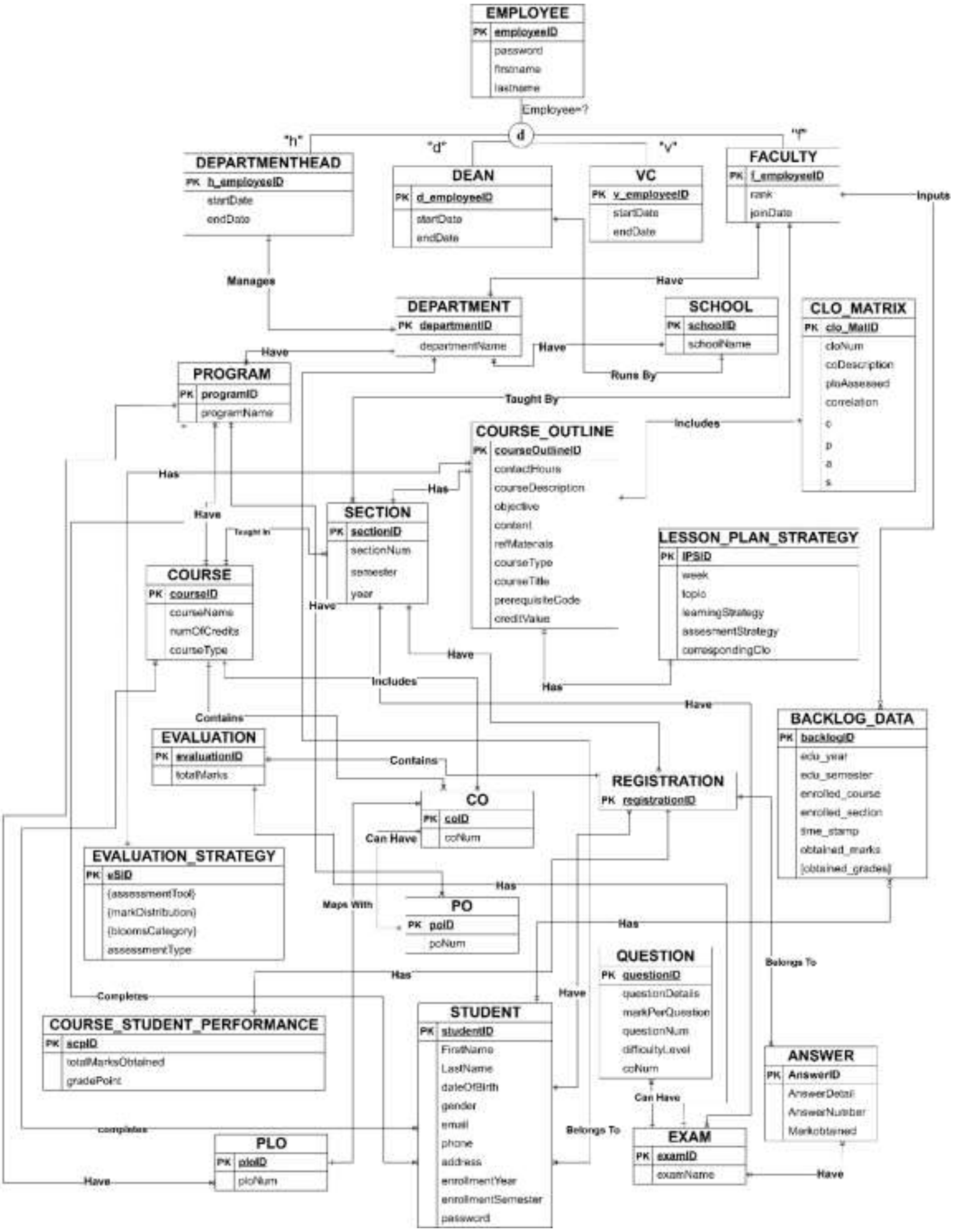


FIGURE 3.1: ENTITY RELATIONSHIP DIAGRAM

C. ENTITY RELATIONSHIP DIAGRAM TO RELATIONAL SCHEMA:

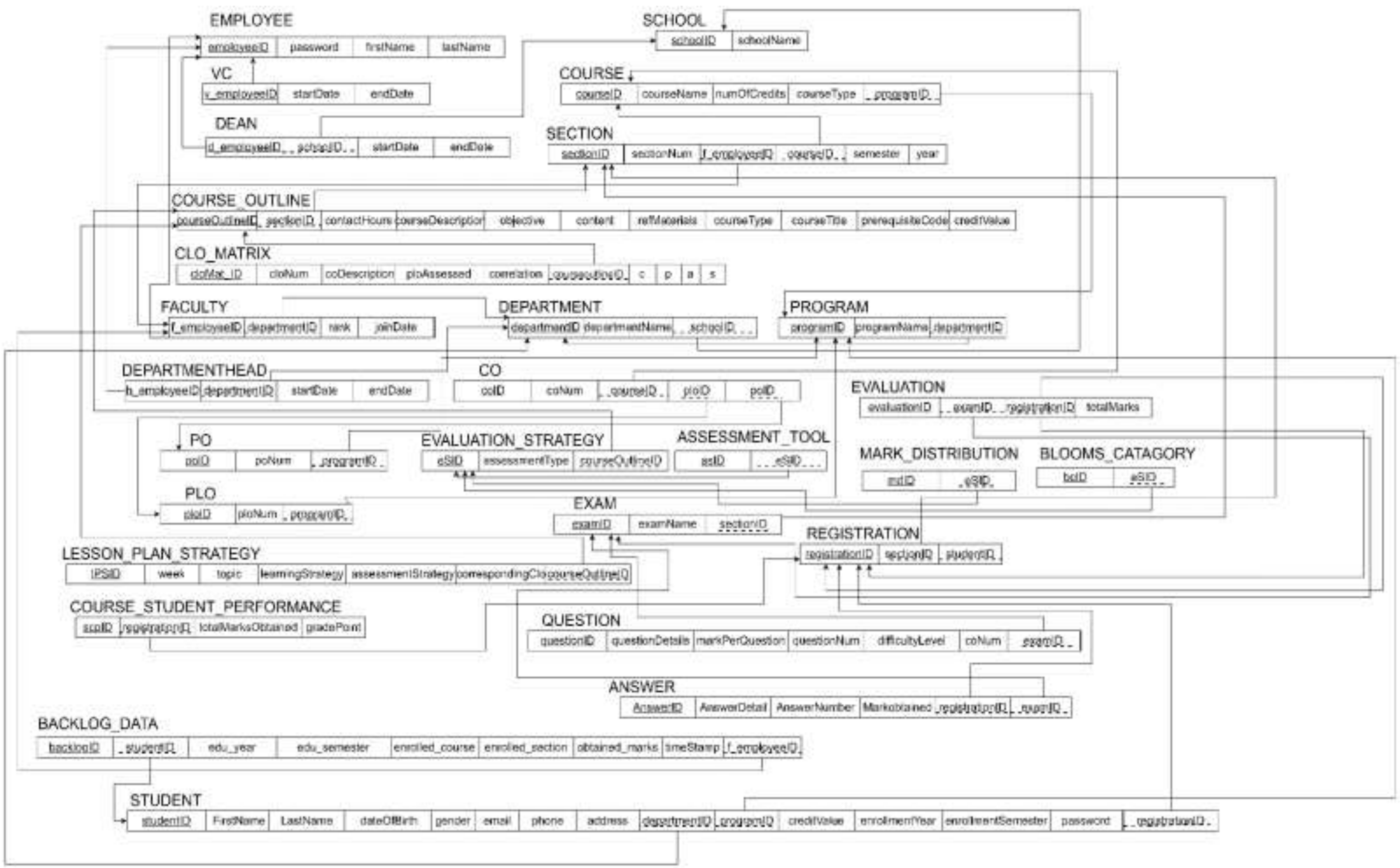

EMPLOYEE
employeeID | password | firstName | lastName
VC
v_employeeID | startDate | endDate
DEAN
d_employeeID | schoolID | startDate | endDate
SCHOOL
schoolID | schoolName
COURSE
courseID | courseName | numOfCredits | courseType | programID
SECTION
sectionID | sectionNum | f_employeeID | courseID | semester | year
COURSE_OUTLINE
courseOutlineID | sectionID | contactHours | courseDescription | objective | content | refMaterials | courseType | courseTitle | prerequisiteCode | creditValue
CLO_MATRIX
cloMat_ID | cloNum | coDescription | ploAssessed | correlation | courseOutlineID | c | p | a | s
FACULTY
f_employeeID | departmentID | rank | joinDate
DEPARTMENT
departmentID | departmentName | schoolID
PROGRAM
programID | programName | departmentID
DEPARTMENTHEAD
h_employeeID | departmentID | startDate | endDate
CO
coID | coNum | courseID | ploID | poID
EVALUATION
evaluationID | examID | registrationID | totalMarks
PO
poID | poNum | programID
EVALUATION_STRATEGY
eSID | assessmentType | courseOutlineID
ASSESSMENT_TOOL
atID | eSID
MARK_DISTRIBUTION
mdID | eSID
BLOOMS_CATAGORY
bcID | eSID
PLO
ploID | ploNum | programID
EXAM
examID | examName | sectionID
REGISTRATION
registrationID | sectionID | studentID
LESSON_PLAN_STRATEGY
lPSID | week | topic | learningStrategy | assessmentStrategy | correspondingClo | courseOutlineID
COURSE_STUDENT_PERFORMANCE
scpID | registrationID | totalMarksObtained | gradePoint
QUESTION
questionID | questionDetails | markPerQuestion | questionNum | difficultyLevel | coNum | examID
ANSWER
AnswerID | AnswerDetail | AnswerNumber | Markobtained | registrationID | examID
BACKLOG_DATA
backlogID | studentID | edu_year | edu_semester | enrolled_course | enrolled_section | obtained_marks | timeStamp | f_employeeID
STUDENT
studentID | FirstName | LastName | dateOfBirth | gender | email | phone | address | departmentID | programID | creditValue | enrollmentYear | enrollmentSemester | password | registrationID

FIGURE 3.2: RELATIONAL SCHEMA

D. NORMALIZATION:

EMPLOYEE(e)	employeeID	e1
	password	e2
	firstName	e3
	lastName	e4
VC(v)	v_employeeID	v1
	startDate	v2
	endDate	v3
DEAN(w)	d_employeeID	w1
	schoolID	h1
	startDate	w2
	endDate	w3
FACULTY(f)	f_employeeID	f1
	departmentID	d1
	rank	f2
	joinDate	f3
COURSE_OUTLINE (c)	courseOutlineID	c1
	sectionID	y1
	contactHours	c2
	courseDescription	c3
	objective	c4
	content	c5
	refMaterials	c6
	courseType	c7
	courseTitle	c8
	prerequsiteCode	c9
	creditValue	c10
DEPARTMENTHEAD(k)	h_employeeID	k1
	departmentID	d1
	startDate	k2
	endDate	k3
DEPARTMENT(d)	departmentID	d1
	departmentName	d2
	schoolID	h1
COURSE(u)	courseID	u1
	courseName	u2
	numOfCredits	u3
	courseType	u4
	programID	r1
PROGRAM (r)	programID	r1
	programName	r2
	departmentID	d1
PO (x)	poID	x1
	poNum	x2
	programID	r1
QUESTION(q)	questionID	q1
	questionDetails	q2
	markPerQuestion	q3
	questionNum	q4
	difficultyLevel	q5
	examID	e1
	courseID	u1
	coNum	q6
REGISTRATION (g)	registrationID	g1

	sectionID	y1
	studentID	s1
SECTION(y)	sectionID	y1
	sectionNum	y2
	courseID	u1
	facultyID	f1
	semester	y3
	year	y4
STUDENT(s)	studentID	s1
	firstName	s2
	lastName	s3
	dateOfBirth	s4
	gender	s5
	email	s6
	phone	s7
	address	s8
	departmentID	d1
	programID	r1
	enrollmentSemester	s9
	enrollmentYear	s10
	password	s11
SCHOOL (h)	schoolID	h1
	schoolName	h2
CLO_MATRIX (m)	clo_MatID	m1
	cloNum	m2
	coDescription	m3
	ploAssessed	m4
	correlation	m5
	courseOutlineID	c1
	c	m6
	p	m7
	a	m8
	s	m9
PLO (p)	ploID	p1
	ploNum	p2
	programID	r1
CO (o)	coID	o1
	coNum	o2
	courseID	u1
	ploID	p1
	poID	x1
ANSWER (a)	answerID	a1
	answerDetails	a2
	answerNum	a3
	markObtained	a4
	registrationID	g1
	examID	e1
EVALUATION_STRATEGY (t)	eSID	t1
	assessmentType	t2
	courseOutlineID	c1
ASSESSMENT_TOOL(at)	asID	at1
	eSID	t1
MARK_DISTRIBUTION(j)	mdID	j1
	eSID	t1
BLOOMS_CATAGORY(b)	bcID	b1
	eSID	t1
EVALUTION (n)	evaluationID	n1

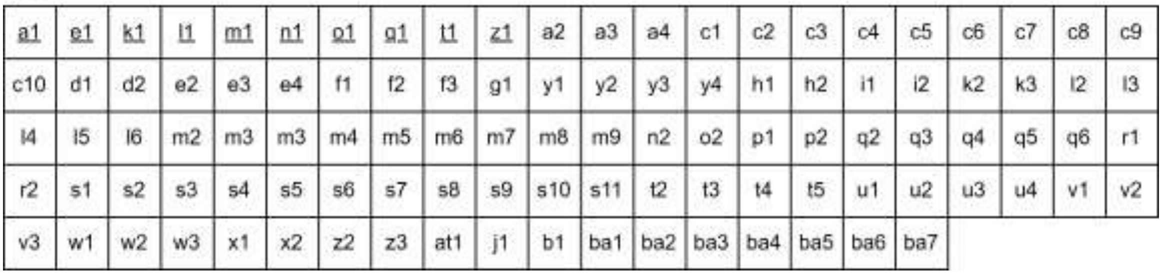
	examID	e1
	registrationID	g1
	totalMarks	n2
EXAM (i)	examID	i1
	examName	i2
	sectionID	y1
LESSON_PLAN_STRATEGY (l)	lPSID	l1
	week	l2
	topic	l3
	learningStrategy	l4
	assessmentStrategy	l5
	correspondingClo	l6
	courseOutlineID	c1
STUDENT_COURSE_PERFORMANCE(z)	scpID	z1
	registrationID	g1
	totalMarksObtained	z2
	gradePoint	z3
BACKLOG(ba)	backlogID	ba1
	studentID	s1
	enrolled_course	ba2
	enrolled_section	ba3
	edu_semester	ba4
	edu_year	ba5
	obtained_marks	ba6
	time_stamp	ba7
	f_employeeID	f1

1NF:

1) There are no repeating groups

2) There is at least one primary key

T1



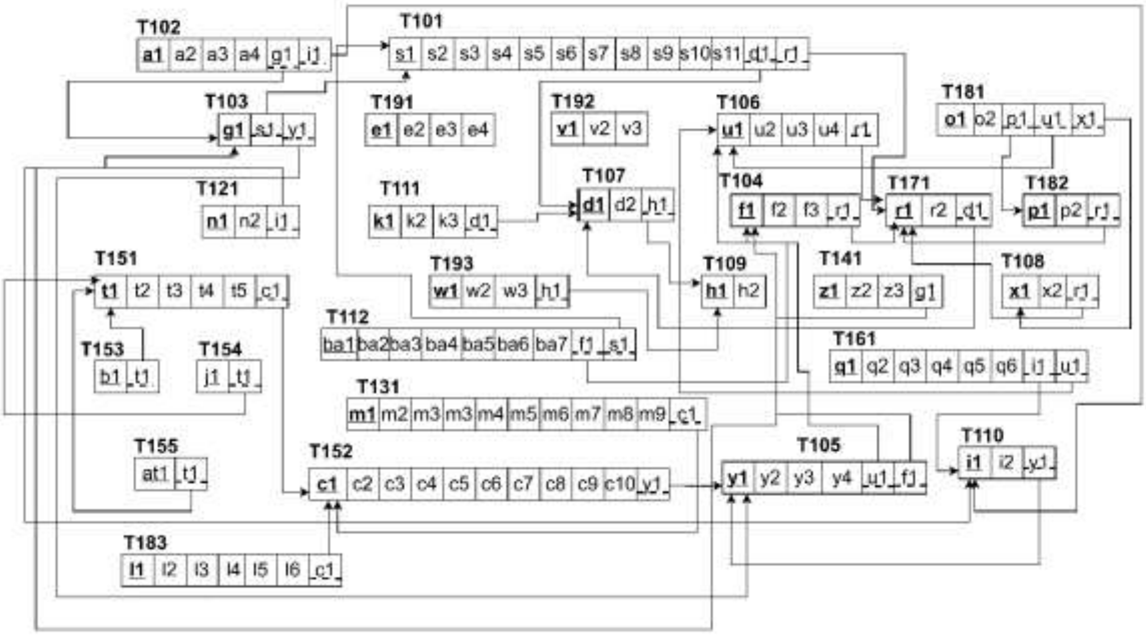
a1	e1	k1	l1	m1	n1	o1	q1	t1	z1	a2	a3	a4	c1	c2	c3	c4	c5	c6	c7	c8	c9
c10	d1	d2	e2	e3	e4	f1	f2	f3	g1	y1	y2	y3	y4	h1	h2	i1	i2	k2	k3	l2	l3
l4	l5	l6	m2	m3	m3	m4	m5	m6	m7	m8	m9	n2	o2	p1	p2	q2	q3	q4	q5	q6	r1
r2	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	t2	t3	t4	t5	u1	u2	u3	u4	v1	v2
v3	w1	w2	w3	x1	x2	z2	z3	at1	j1	b1	ba1	ba2	ba3	ba4	ba5	ba6	ba7				

2NF:

1)Partial dependency has been removed

3NF:

1)Has no transitive dependencies



E.DATA DICTIONARY

VC_T

Name	Data Type	Size	Remark
v_employeeID	INTEGER	11	This is the foreign key from the Employee table. E.g: “4250”
startDate	DATE		This is starting date for the VC. E.g: “01-03-2020”
endDate	DATE		This is the date VC retire from his post. E.g:“01-03-2024”

STUDENT_COURSE_PERFORMANCE_T

Name	Data Type	Size	Remark
scpID	INTEGER	11	This is the primary key for this table
registrationID	INTEGER	11	This is the foreign Key from registration table
totalMarksObtained	INTEGER	11	This is the total marks obtained by the student
gradePoint	FLOAT		This is the grade point achieved by the student
obtainedGrade	VARCHAR	24	This is the obtain grade achieved by the student.

SCHOOL_T

Name	Data Type	Size	Remark
schoolID	VARCHAR	5	This is the primary key of School. E.g. “SETS”
schoolName	VARCHAR	50	This is the name of the School. E.g: “School of Engineering, Technology & School

STUDENT_T

Name	Data Type	Size	Remark
studentID	INTEGER	11	This is the primary key for the Student table. E.g: “2010664”.
firstName	VARCHAR	30	This is the first name of the student. E.g: “Tasnim”.
lastName	VARCHAR	30	This is the last name of the student. E.g: “Nazifa”.
dateOfBirth	DATE		This is the birth date of the student. E.g: “24- 10-2001”.
gender	VARCHAR	6	This is the gender of the student. E.g: “Female”.
email	VARCHAR	30	This is the email of the student. E.g:“2010664@iub.edu.bd”
phone	VARCHAR	11	This is the phone number of the student. E.g: “01XXXXXXXXX”.

address	VARCHAR	50	This is the address of the student. E.g: “House 6,Road2 ,Block A, Bashundhara RA
departmentID	VARCHAR	3	This is the foreign key from the Department table. E.g: “CSE”
programID	INTEGER	11	This is the foreign key from the Program table. E.g: “1”
enrollmentSemester	VARCHAR	10	This is the enrollment semester of the student.
enrollmentYear	VARCHAR	4	This is enrollment year of the student.

SECTION_T

Name	Data Type	Size	Remark
sectionID	INTEGER	11	This is the Primary Key for Section. E.g: “1”
sectionNum	INTEGER	11	This is the section number. E.g: “1”
semester	VARCHAR	6	This is the semester of the section.E.g: “spring”
year	YEAR	4	This is the year of the semester when this section was taken.E.g: “2020”
courseID	VARCHAR	6	This is the foreign key from the Course table. E.g: “CSE101”
facultyID	INTEGER	11	This is the foreign key from Faculty table. E.g: “1801”

LESSON_PLAN_STRATEGY_T

Name	Data Type	Size	Remark
lpsID	INTEGER	11	This is the primary key of the table
week	INTEGER	11	This is the week number
topic	MEDIUMTEXT		This is the topic name
learningStrategy	MEDIUMTEXT		This is the lesson plan strategy of that topic

assessmentStrategy	VARCHAR	10	This is the assessment strategy of that topic
courseOutlineID	INTEGER	11	This is the foreign key from course outline table

REGISTRATION_T

Name	Data Type	Size	Remark
registrationID	INTEGER	11	This is the Primary Key for Registration. E.g: “0101010101”
sectionID	INTEGER	11	This is the foreign key from section table
studentID	INTEGER	11	This is the foreign key from student table

QUESTION_T

Name	Data Type	Size	Remark
questionID	INTEGER	11	This is the primary key of this table
questionDetails	MEDIUMTEXT		This is the question.
markPerQuestion	INTEGER	11	This is the mark each question contains
questionNum	INTEGER	11	This is the number of the question
difficultyLevel	INTEGER	11	This is the difficulty level of the question
examID	VARCHAR	20	This is the foreign key from exam table
courseID	VARCHAR	6	This is the foreign key from course table
coNum	INTEGER	11	This is the CO number of the question

PROGRAM_T

Name	Data Type	Size	Remark
programID	INTEGER	11	This is the primary Key for a program. E.g: “1”
programName	VARCHAR	50	This is the name of the program. E.g: “Bachelor of Science”
departmentID	VARCHAR	3	This is the foreign key from the Department table. E.g: “CSE”

PO_T

Name	Data Type	Size	Remark
poID	VARCHAR	5	This is the primary key for Program Outcome. E.g: “PO1”
poNum	INTEGER	11	This is the PO number. E.g: “1”
programID	INTEGER	11	This is a foreign key from Program table.E.g: “1”

PLO_T

Name	Data Type	Size	Remark
ploID	INTEGER	11	This is the primary key for Program Learning Outcome. E.g: “PLO1”
ploNum	INTEGER	11	This is the PLO number. E.g: “1”
programID	INTEGER	11	This is a foreign key from Program table. E.g: “1”

EXAM_T

Name	Data Type	Size	Remark
examID	INTEGER	11	This is the primary key for this table
examName	VARCHAR	30	This is the name of the exam
sectionID	INTEGER	11	This is the foreign key from exam table

FACULTY_T

Name	Data Type	Size	Remark
f_employeeID	INTEGER	11	This is the foreign key from the Employee table. E.g: “4250”
departmentID	VARCHAR	3	This is the DepartmentID of the department faculty belongs to. E.g: “CSE”
rank	VARCHAR	30	This is the rank of the faculty. E.g: “Assistant Professor”
joinDate	DATE		This is starting date. E.g: “01-03-2020”

EMPLOYEE_T

Name	Data Type	Size	Remark
employeeID	INTEGER	11	This is the primary key for Employee table. E.g: “1801”
password	VARCHAR	10	This is the password of the employee
firstName	VARCHAR	50	This is the last name of the faculty. E.g: “Ahmed”
lastName	VARCHAR	50	This is the last name of the faculty. E.g: “Ahmed”

DEPARTMENT_T

Name	Data Type	Size	Remark
departmentID	VARCHAR	3	This is the primary key for the Department table. E.g: “CSE”
departmentName	VARCHAR	50	This is the name of the department. E.g. “Computer Science and Engineering”.
schoolID	VARCHAR	5	This is a foreign key from the School table. E.g: “SETS”.

EVALUATION_T

Name	Data Type	Size	Remark
evaluationID	INTEGER	11	This is the primary key for this table
examID	VARCHAR	20	This is the foreign key from exam table
registrationID	INTEGER	11	This is the foreign key from registration table
totalMarks	INTEGER	11	This is the total marks achieved by the student in a specific exam

EVALUATION_STRATEGY_T

Name	Data Type	Size	Remark
eSID	INTEGER	11	This is the primary key for this table
courseOutlineID	INTEGER	11	This is the foreign key from course outline table
assesmentType	VARCHAR	30	This is the type of assessment done for evaluation.

ASSESSMENT_TOOL_T

Name	Data Type	Size	Remark
asID	INTEGER	11	This is the primary key for this table
eSID	INTEGER	11	This is the foreign key from evaluation strategy table

MARK_DISTRIBUTION_T

Name	Data Type	Size	Remark
mdID	INTEGER	11	This is the primary key for this table
eSID	INTEGER	11	This is the foreign key from evaluation strategy table

BLOOMS_CATEGORY_T

Name	Data Type	Size	Remark
bcID	INTEGER	11	This is the primary key for this table
eSID	INTEGER	11	This is the foreign key from evaluation strategy table

DEPARTMENTHEAD_T

Name	Data Type	Size	Remark
h_employeeID	INTEGER	11	This is the foreign key from the Employee table. E.g: “4250”
departmentID	VARCHAR	3	This is the DepartmentID of the department HEAD manages. E.g: “CSE”
startDate	DATE		This is starting date. E.g: “01-03 2020”
endDate	DATE		This is the date HEAD retire from his post. E.g: “01-03-2024”

BACKLOG_DATA_T

Name	Data Type	Size	Remark
backlogID	INTEGER	11	This is the primary key for this table
f_employeeID	INTEGER	11	This is the foreign key from faculty table
studentID	INTEGER	11	This is the foreign key from student table
enrolled_course	CHAR	6	This is the course code of the Course. E.g: “CSE201”
enrolled_section	INTEGER	11	This is the section number. E.g: “1”
edu_semester	CHAR	6	This is the semester of the section. E.g: “Summer”
edu_year	YEAR	4	This is the year of the specific section of the specific course which was taken by a specific faculty
obtained_marks	DECIMAL	(4,1)	This is the obtained number for a student.
timestamp	TIMESTAMP		This is the timestamp for backlog data.Eg:”21-12-2022 11:45:28”

DEAN_T

Name	Data Type	Size	Remark
d_employeeID	INTEGER	11	This is the foreign key from the Employee table. E.g: “4250”
schoolID	VARCHAR	5	This is the SchoolID of the school DEAN manages. E.g: “SETS”
startDate	DATE		This is starting date. E.g: “01-03-2020”
endDate	DATE		This is the date DEAN retire from his post. E.g: “01-03-2024”

COURSE_T

Name	Data Type	Size	Remark
courseID	VARCHAR	6	This is the Primary Key for the Course. E.g: “CSE203”
courseName	VARCHAR	40	This is the name of the Course. E.g: “Discreet Mathematics”
numOfCredits	INTEGER	11	This is the number of credits for the Course. E.g: “3”
courseType	VARCHAR	10	This is the type of the Course. E.g: “Core”
programID	INTEGER	11	This is the foreign key from the program table. E.g: “1”

COURSE_OUTLINE_T

Name	Data Type	Size	Remark
courseOutlineID	INTEGER	11	This is the primary key for this table
sectionID	INTEGER	11	This is the foreign key from the section table
courseDescription	MEDIUMTEXT		This is the description of the course
objective	MEDIUMTEXT		This is the objective of the course
content	MEDIUMTEXT		This is the content of the course
refMaterials	MEDIUMTEXT		This is the reference material
courseTitle	VARCHAR	1000	This is the title of the course
prerequsiteCode	VARCHAR	6	This is the prerequisite course code
creditValue	INTEGER	11	This is the credit value of the course

CO_T

Name	Data Type	Size	Remark
coID	INTEGER	11	This is the primary key for the CO table. E.g: “CO1”.
coNum	INTEGER	11	This is the CO number. E.g: 1,2 etc.
courseID	VARCHAR	6	This is the foreign key from the Course table. E.g:“CSE303”
ploID	VARCHAR	5	This is the foreign key from the PLO table. E.g: “PLO1”
poID	VARCHAR	6	This is the foreign key from the PLO table. E.g: “PO1”

CLO_MATRIX_T

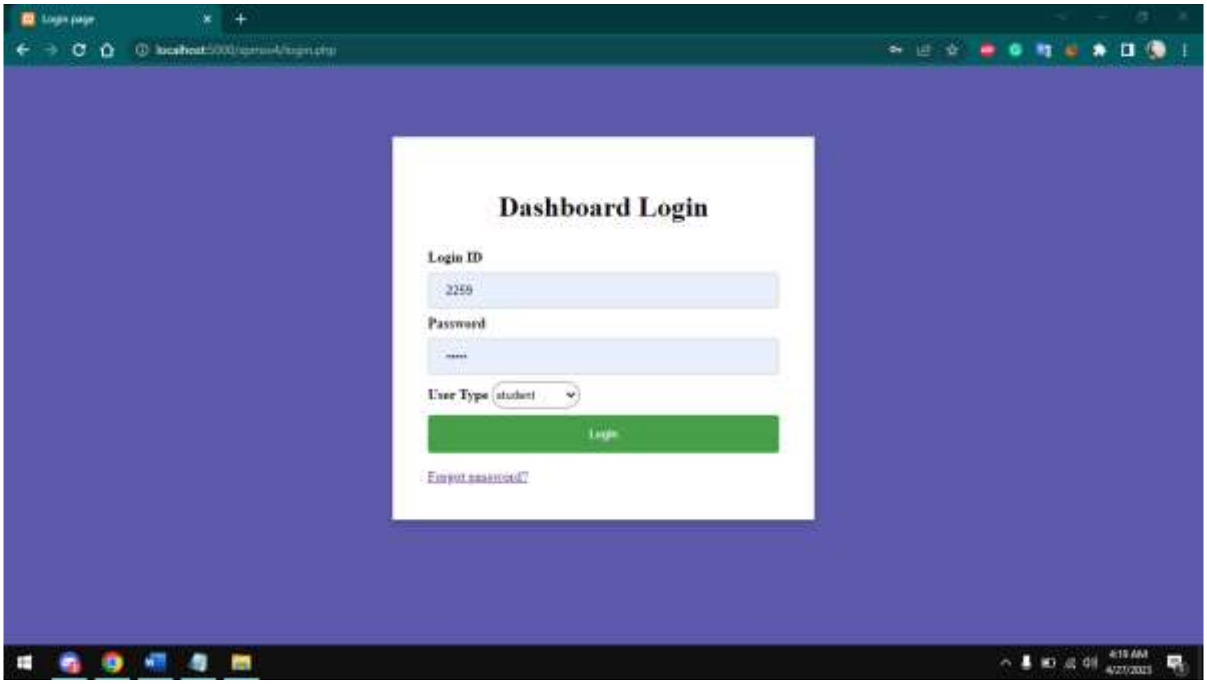
Name	Data Type	Size	Remark
clo_MatID	INTEGER	11	This is the primary key for this table
cloNum	INTEGER	11	This is the clo number
coDescription	MEDIUMTEXT		This is the co description
ploAssessed	VARCHAR	10	This is the name of the plo assessed
correlation	INTEGER	11	This is the correlation value or number
courseOutlineID	INTEGER	11	This is the foreign key from the course outline table
c	INTEGER	11	This is the bloom's category level
p	INTEGER	11	This is the bloom's category level
a	INTEGER	11	This is the bloom's category level
s	INTEGER	11	This is the bloom's category level

ANSWER_T

Name	Data Type	Size	Remark
answerID	INTEGER	11	This is the primary key for this table
answerDetails	MEDIUMTEXT		This is the answer details
answerNum	INTEGER	11	This is the number of the answer
markObtained	INTEGER	11	This is the mark obtained by the student for each answer
registrationID	INTEGER	11	This is the foreign key from registration table
examID	INTEGER	11	This is the foreign key from the exam table

CHAPTER-4 PHYSICAL SYSTEM DESIGN

A. INPUT FORMS:



Dashboard Login

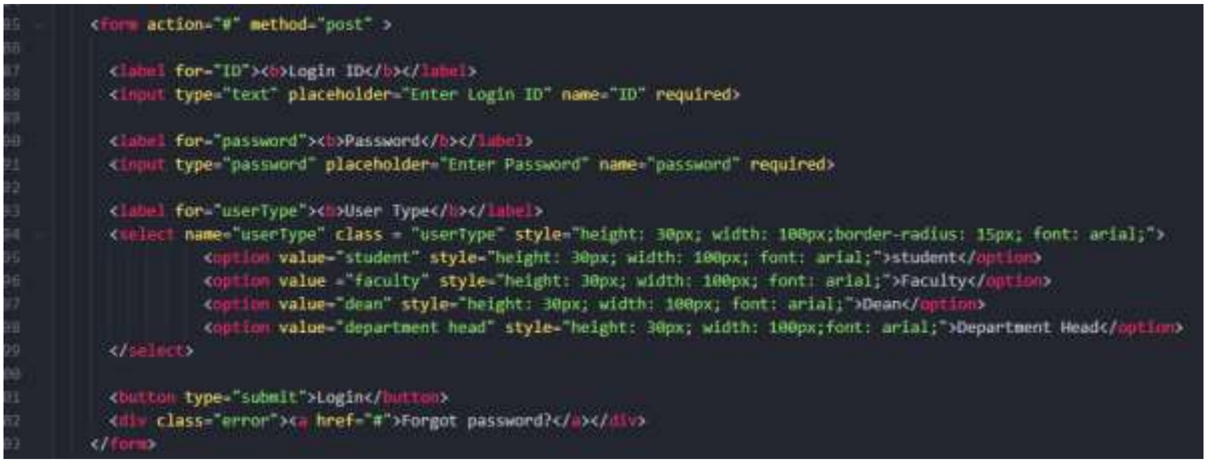
Login ID

2259

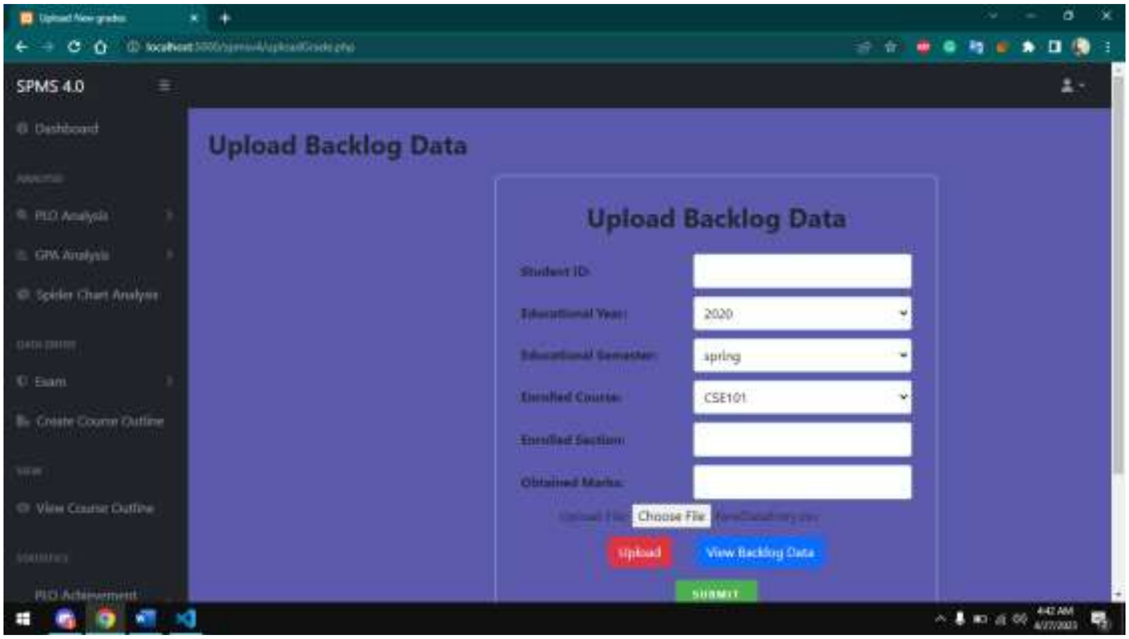
Password

••••••

User Type student



```
<form action="#" method="post" >

  <label for="ID"><b>Login ID</b></label>
  <input type="text" placeholder="Enter Login ID" name="ID" required>

  <label for="password"><b>Password</b></label>
  <input type="password" placeholder="Enter Password" name="password" required>

  <label for="userType"><b>User Type</b></label>
  <select name="userType" class = "userType" style="height: 30px; width: 100px;border-radius: 15px; font: arial;">
            <option value="student" style="height: 30px; width: 100px; font: arial;">student</option>
            <option value ="faculty" style="height: 30px; width: 100px; font: arial;">Faculty</option>
            <option value="dean" style="height: 30px; width: 100px; font: arial;">Dean</option>
            <option value="department head" style="height: 30px; width: 100px;font: arial;">Department Head</option>
  </select>

  <button type="submit">Login</button>
  <div class="error"><a href="#">Forgot password?</a></div>
</form>
```



Upload Backlog Data

Upload Backlog Data

Student ID:

Educational Year: 2020

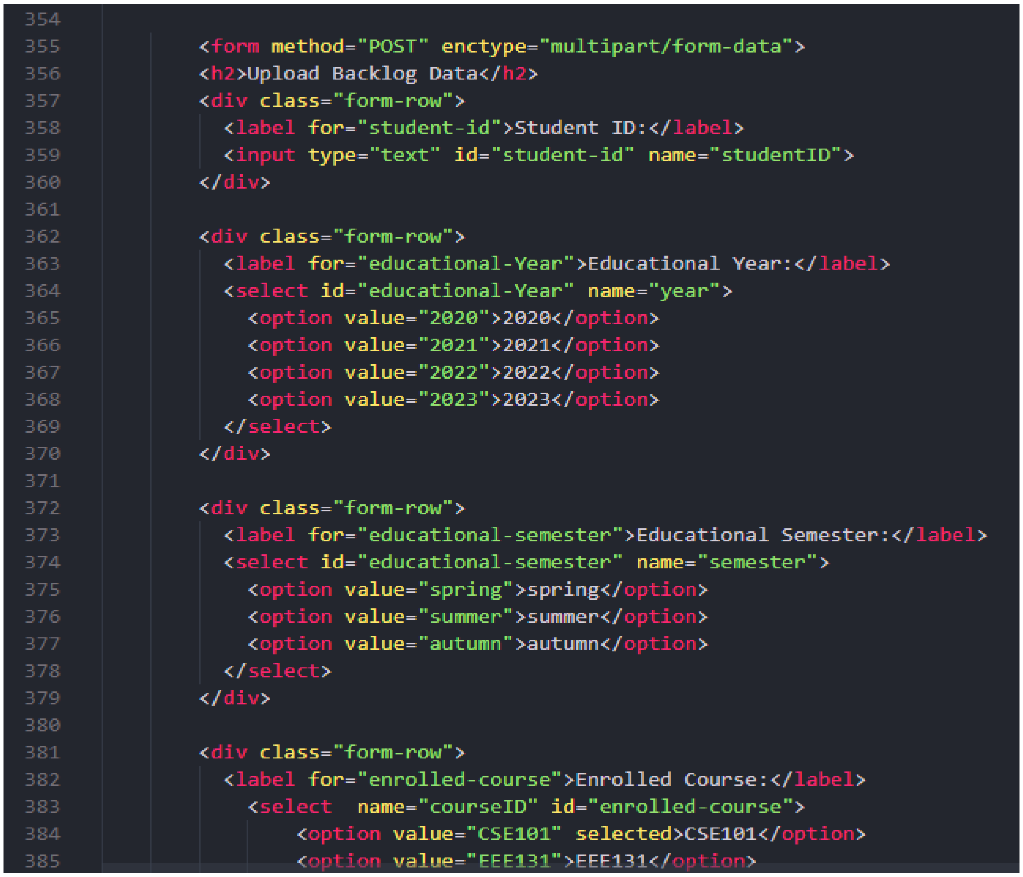
Educational Semester: spring

Enrolled Course: CSE101

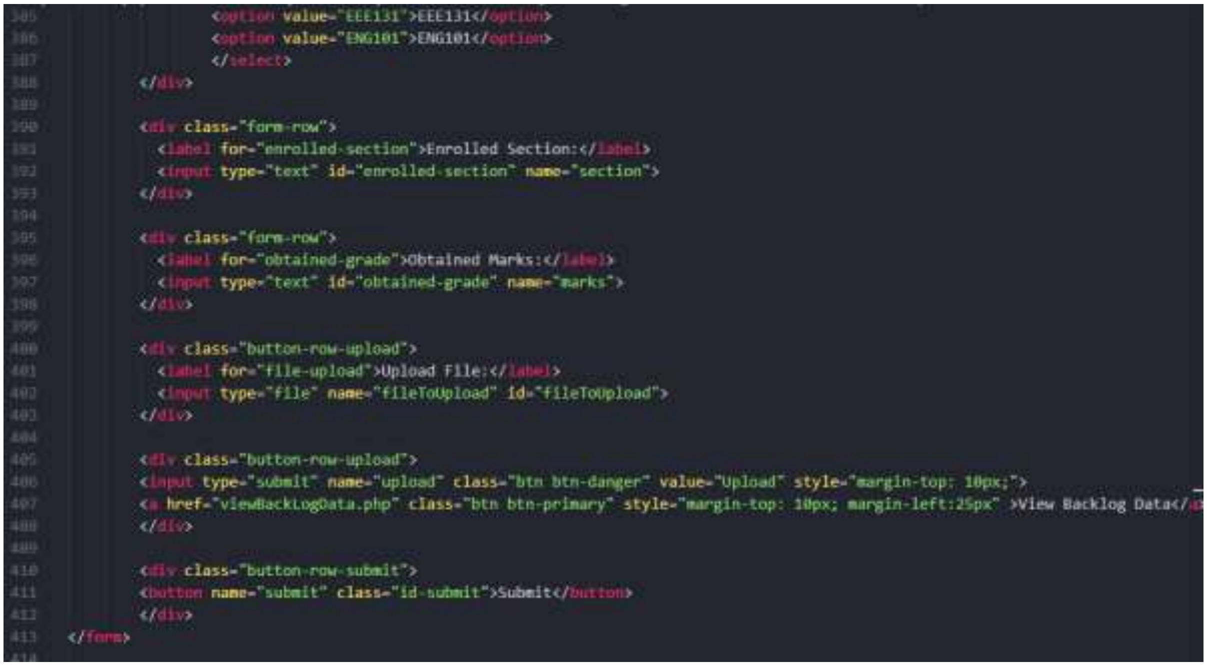
Enrolled Section:

Obtained Marks:

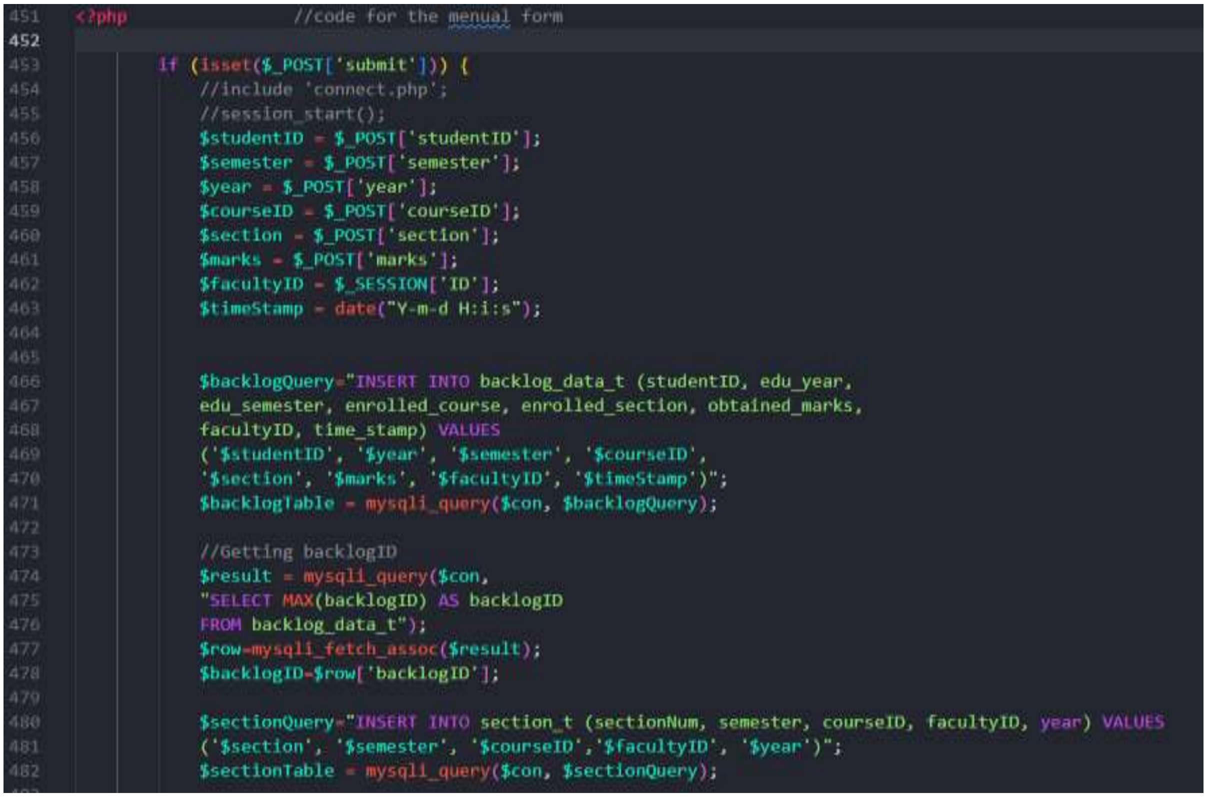
Upload File: Choose File



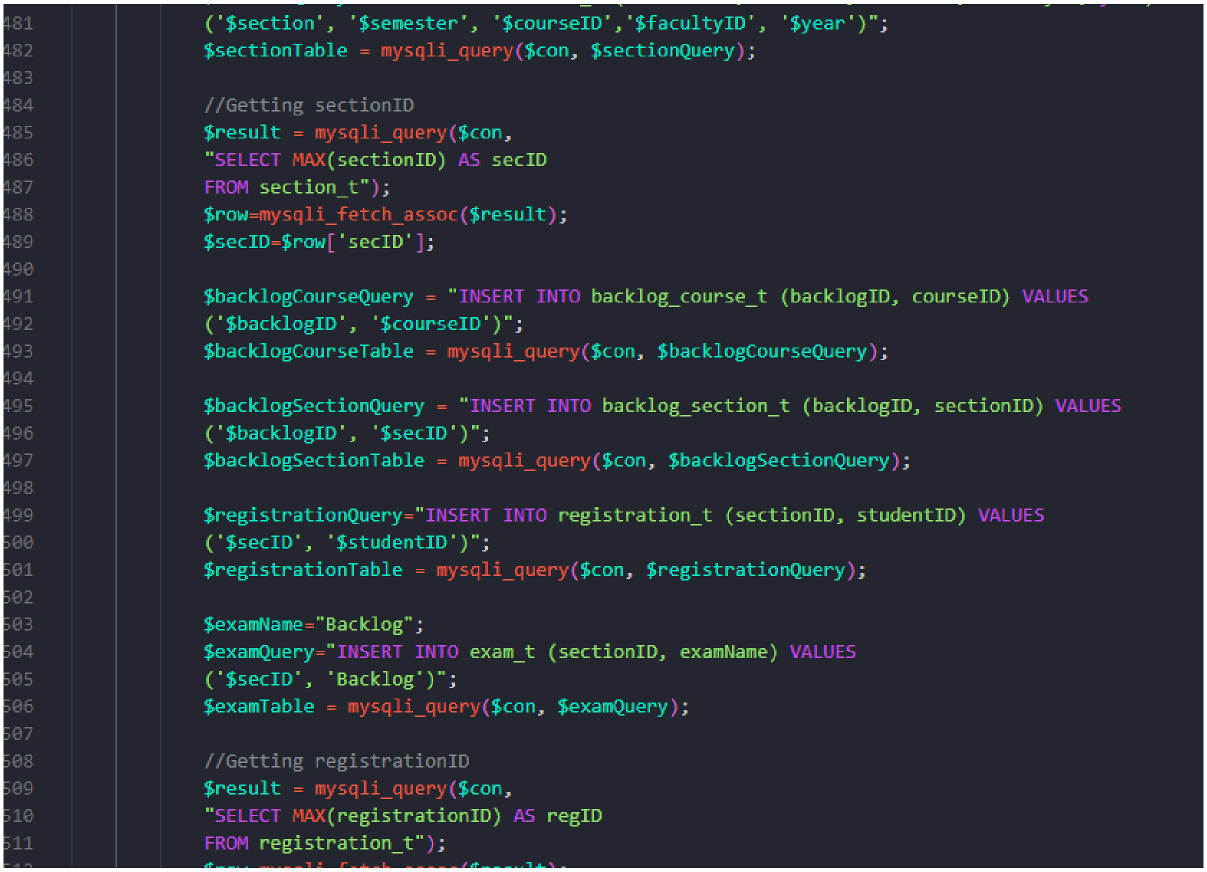
```
<form method="POST" enctype="multipart/form-data">
<h2>Upload Backlog Data</h2>
<div class="form-row">
  <label for="student-id">Student ID:</label>
  <input type="text" id="student-id" name="studentID">
</div>

<div class="form-row">
  <label for="educational-Year">Educational Year:</label>
  <select id="educational-Year" name="year">
    <option value="2020">2020</option>
    <option value="2021">2021</option>
    <option value="2022">2022</option>
    <option value="2023">2023</option>
  </select>
</div>

<div class="form-row">
  <label for="educational-semester">Educational Semester:</label>
  <select id="educational-semester" name="semester">
    <option value="spring">spring</option>
    <option value="summer">summer</option>
    <option value="autumn">autumn</option>
  </select>
</div>

<div class="form-row">
  <label for="enrolled-course">Enrolled Course:</label>
    <select  name="courseID" id="enrolled-course">
        <option value="CSE101" selected>CSE101</option>
        <option value="EEE131">EEE131</option>
```



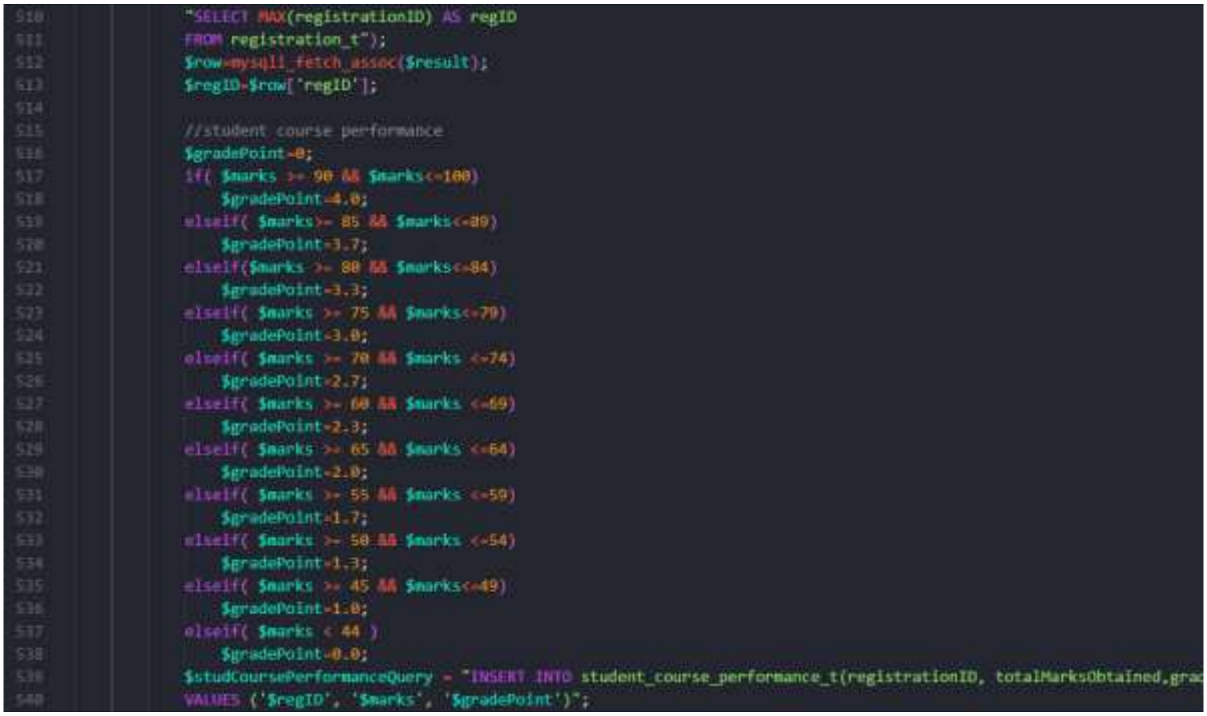
```
                <option value="EEE131">EEE131</option>
                <option value="ENG101">ENG101</option>
                </select>
        </div>

        <div class="form-row">
          <label for="enrolled-section">Enrolled Section:</label>
          <input type="text" id="enrolled-section" name="section">
        </div>

        <div class="form-row">
          <label for="obtained-grade">Obtained Marks:</label>
          <input type="text" id="obtained-grade" name="marks">
        </div>

        <div class="button-row-upload">
          <label for="file-upload">Upload File:</label>
          <input type="file" name="fileToUpload" id="fileToUpload">
        </div>

        <div class="button-row-upload">
        <input type="submit" name="upload" class="btn btn-danger" value="Upload" style="margin-top: 10px;">
        <a href="viewBackLogData.php" class="btn btn-primary" style="margin-top: 10px; margin-left:25px" >View Backlog Data</
        </div>

        <div class="button-row-submit">
        <button name="submit" class="id-submit">Submit</button>
        </div>
</form>
```



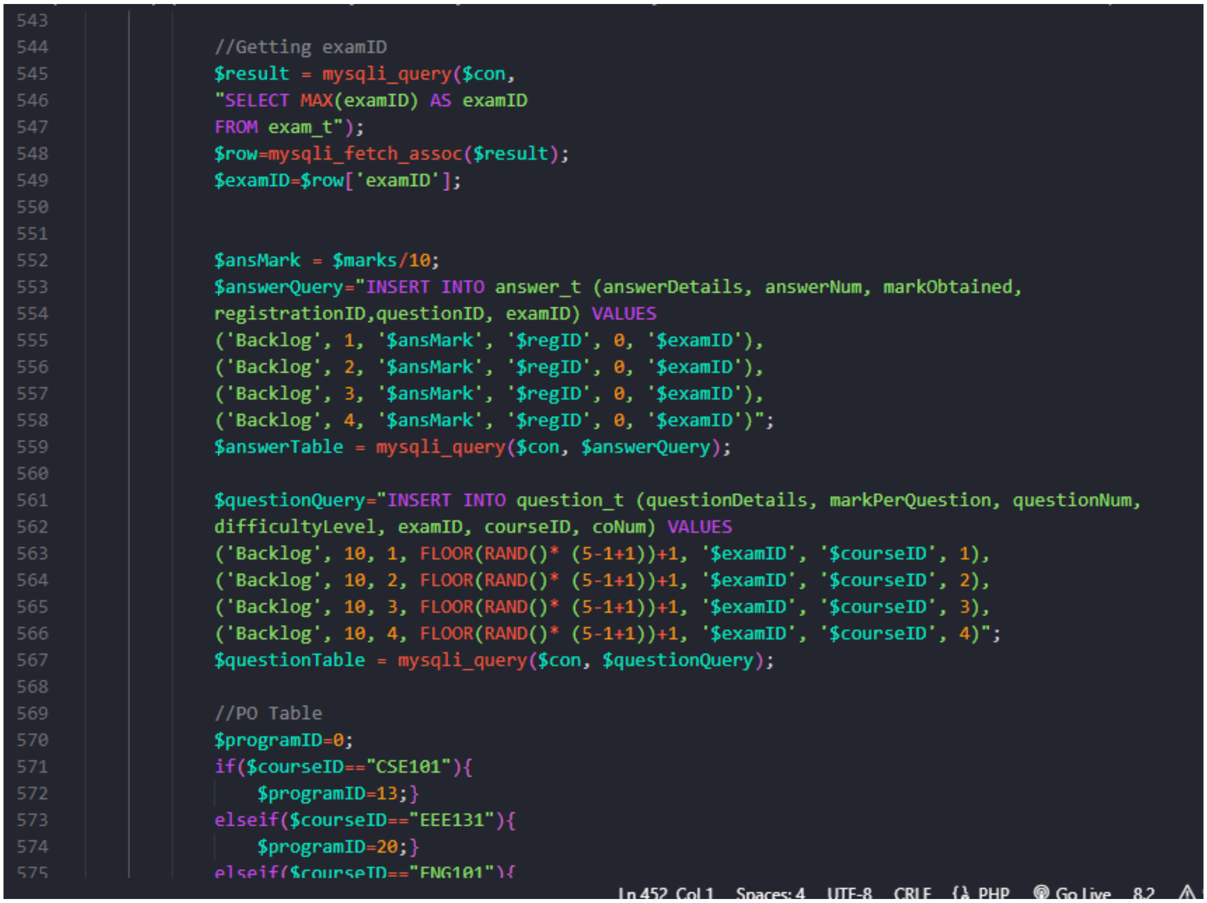
```
<?php                //code for the menual form

        if (isset($_POST['submit'])) {
            //include 'connect.php';
            //session_start();
            $studentID = $_POST['studentID'];
            $semester = $_POST['semester'];
            $year = $_POST['year'];
            $courseID = $_POST['courseID'];
            $section = $_POST['section'];
            $marks = $_POST['marks'];
            $facultyID = $_SESSION['ID'];
            $timeStamp = date("Y-m-d H:i:s");


            $backlogQuery="INSERT INTO backlog_data_t (studentID, edu_year,
            edu_semester, enrolled_course, enrolled_section, obtained_marks,
            facultyID, time_stamp) VALUES
            ('$studentID', '$year', '$semester', '$courseID',
            '$section', '$marks', '$facultyID', '$timeStamp')";
            $backlogTable = mysqli_query($con, $backlogQuery);

            //Getting backlogID
            $result = mysqli_query($con,
            "SELECT MAX(backlogID) AS backlogID
            FROM backlog_data_t");
            $row=mysqli_fetch_assoc($result);
            $backlogID=$row['backlogID'];

            $sectionQuery="INSERT INTO section_t (sectionNum, semester, courseID, facultyID, year) VALUES
            ('$section', '$semester', '$courseID','$facultyID', '$year')";
            $sectionTable = mysqli_query($con, $sectionQuery);
```



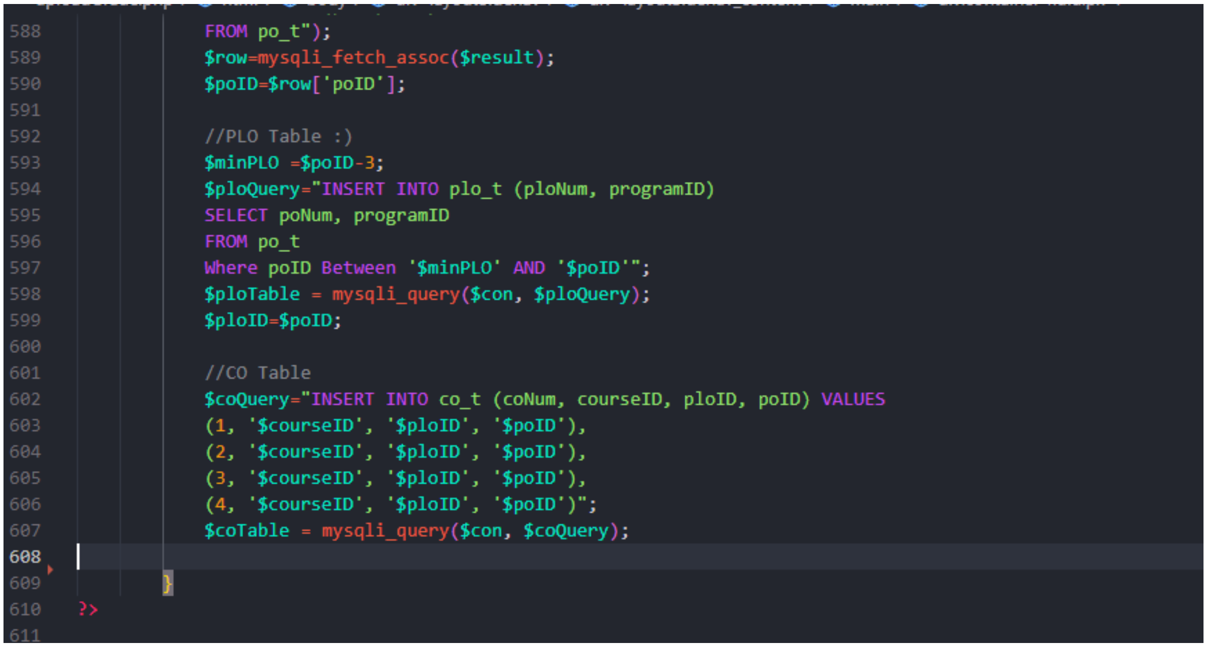
```
('$section', '$semester', '$courseID','$facultyID', '$year')";
$sectionTable = mysqli_query($con, $sectionQuery);

//Getting sectionID
$result = mysqli_query($con,
"SELECT MAX(sectionID) AS secID
FROM section_t");
$row=mysqli_fetch_assoc($result);
$secID=$row['secID'];

$backlogCourseQuery = "INSERT INTO backlog_course_t (backlogID, courseID) VALUES
('$backlogID', '$courseID')";
$backlogCourseTable = mysqli_query($con, $backlogCourseQuery);

$backlogSectionQuery = "INSERT INTO backlog_section_t (backlogID, sectionID) VALUES
('$backlogID', '$secID')";
$backlogSectionTable = mysqli_query($con, $backlogSectionQuery);

$registrationQuery="INSERT INTO registration_t (sectionID, studentID) VALUES
('$secID', '$studentID')";
$registrationTable = mysqli_query($con, $registrationQuery);

$examName="Backlog";
$examQuery="INSERT INTO exam_t (sectionID, examName) VALUES
('$secID', 'Backlog')";
$examTable = mysqli_query($con, $examQuery);

//Getting registrationID
$result = mysqli_query($con,
"SELECT MAX(registrationID) AS regID
FROM registration_t");
```



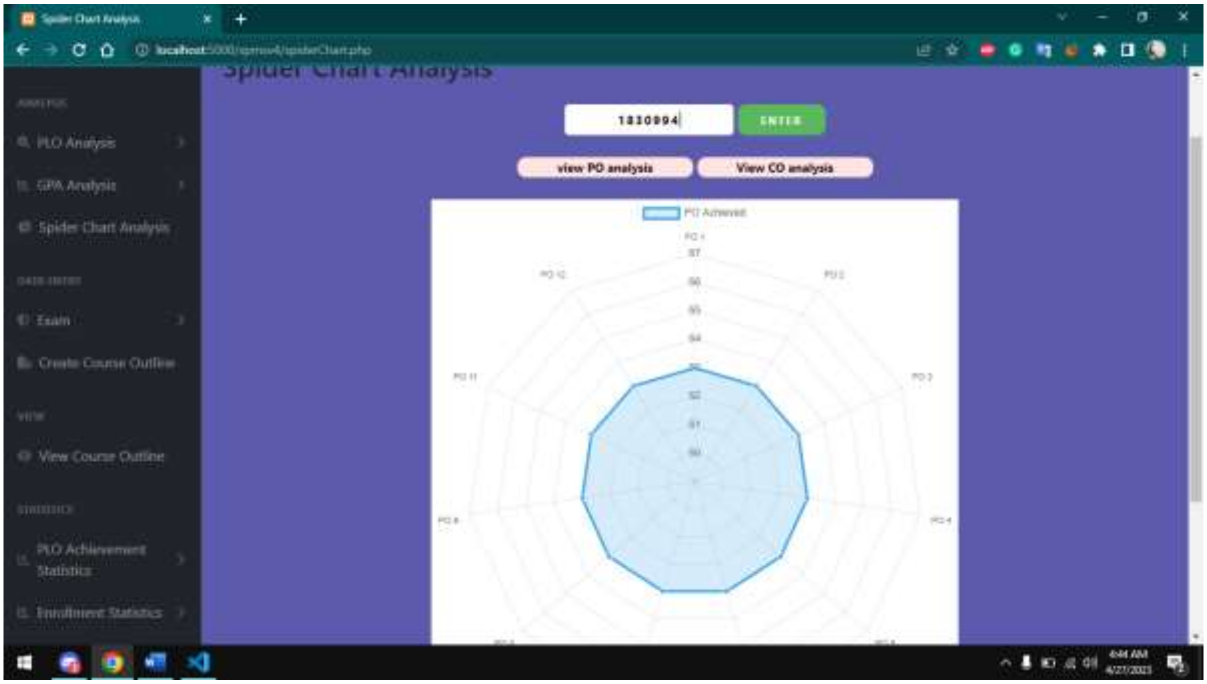
```
"SELECT MAX(registrationID) AS regID
FROM registration_t");
$row=mysqli_fetch_assoc($result);
$regID=$row['regID'];

//student course performance
$gradePoint=0;
if( $marks >= 90 && $marks<=100)
    $gradePoint=4.0;
elseif( $marks>= 85 && $marks<=89)
    $gradePoint=3.7;
elseif($marks >= 80 && $marks<=84)
    $gradePoint=3.3;
elseif( $marks >= 75 && $marks<=79)
    $gradePoint=3.0;
elseif( $marks >= 70 && $marks <=74)
    $gradePoint=2.7;
elseif( $marks >= 60 && $marks <=69)
    $gradePoint=2.3;
elseif( $marks >= 65 && $marks <=64)
    $gradePoint=2.0;
elseif( $marks >= 55 && $marks <=59)
    $gradePoint=1.7;
elseif( $marks >= 50 && $marks <=54)
    $gradePoint=1.3;
elseif( $marks >= 45 && $marks<=49)
    $gradePoint=1.0;
elseif( $marks < 44 )
    $gradePoint=0.0;
$studCoursePerformanceQuery = "INSERT INTO student_course_performance_t(registrationID, totalMarksObtained,grad
VALUES ('$regID', '$marks', '$gradePoint')";
```



```
            //Getting examID
            $result = mysqli_query($con,
            "SELECT MAX(examID) AS examID
            FROM exam_t");
            $row=mysqli_fetch_assoc($result);
            $examID=$row['examID'];


            $ansMark = $marks/10;
            $answerQuery="INSERT INTO answer_t (answerDetails, answerNum, markObtained,
            registrationID,questionID, examID) VALUES
            ('Backlog', 1, '$ansMark', '$regID', 0, '$examID'),
            ('Backlog', 2, '$ansMark', '$regID', 0, '$examID'),
            ('Backlog', 3, '$ansMark', '$regID', 0, '$examID'),
            ('Backlog', 4, '$ansMark', '$regID', 0, '$examID')";
            $answerTable = mysqli_query($con, $answerQuery);

            $questionQuery="INSERT INTO question_t (questionDetails, markPerQuestion, questionNum,
            difficultyLevel, examID, courseID, coNum) VALUES
            ('Backlog', 10, 1, FLOOR(RAND()* (5-1+1))+1, '$examID', '$courseID', 1),
            ('Backlog', 10, 2, FLOOR(RAND()* (5-1+1))+1, '$examID', '$courseID', 2),
            ('Backlog', 10, 3, FLOOR(RAND()* (5-1+1))+1, '$examID', '$courseID', 3),
            ('Backlog', 10, 4, FLOOR(RAND()* (5-1+1))+1, '$examID', '$courseID', 4)";
            $questionTable = mysqli_query($con, $questionQuery);

            //PO Table
            $programID=0;
            if($courseID=="CSE101"){
                $programID=13;}
            elseif($courseID=="EEE131"){
                $programID=20;}
            elseif($courseID=="ENG101"){
```

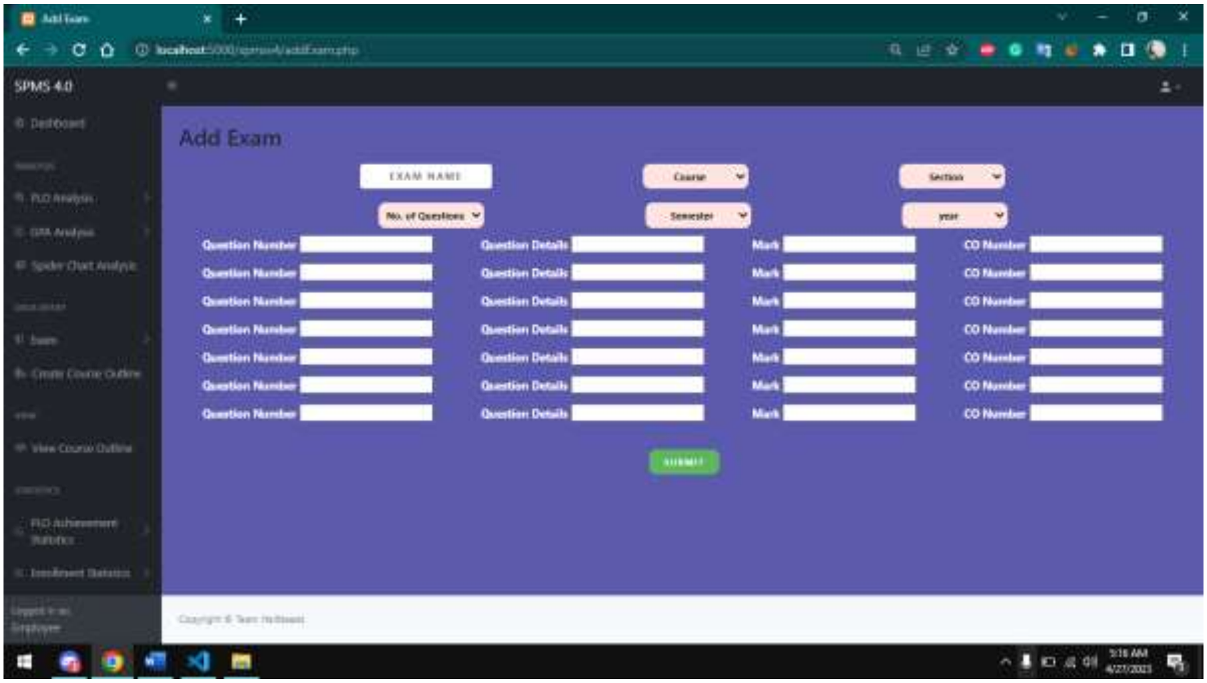


```
            FROM po_t");
            $row=mysqli_fetch_assoc($result);
            $poID=$row['poID'];

            //PLO Table :)
            $minPLO =$poID-3;
            $ploQuery="INSERT INTO plo_t (ploNum, programID)
            SELECT poNum, programID
            FROM po_t
            Where poID Between '$minPLO' AND '$poID'";
            $ploTable = mysqli_query($con, $ploQuery);
            $ploID=$poID;

            //CO Table
            $coQuery="INSERT INTO co_t (coNum, courseID, ploID, poID) VALUES
            (1, '$courseID', '$ploID', '$poID'),
            (2, '$courseID', '$ploID', '$poID'),
            (3, '$courseID', '$ploID', '$poID'),
            (4, '$courseID', '$ploID', '$poID')";
            $coTable = mysqli_query($con, $coQuery);

        }
?>
```

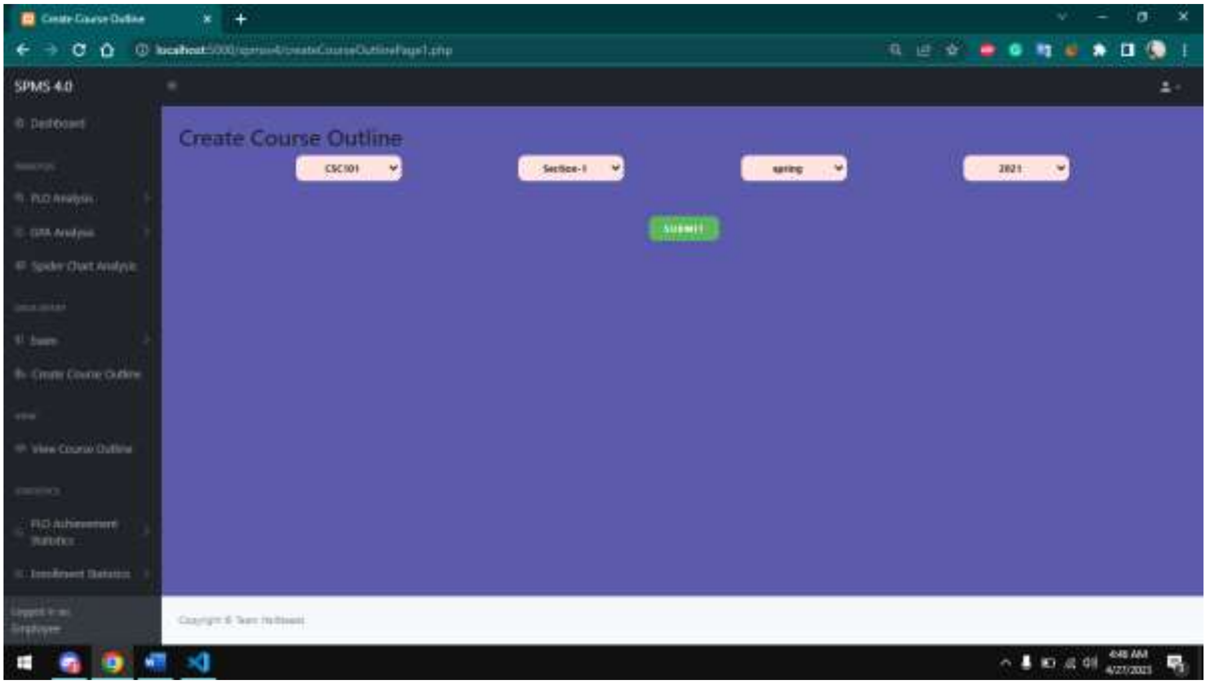


1830994

Spider Chart Analysis
localhost:5000/spmsv4/spiderChart.php
Spider Chart Analysis
PLO Analysis
GPA Analysis
Spider Chart Analysis
Exam
Create Course Outline
View Course Outline
PLO Achievement Statistics
Enrollment Statistics
ENTER
view PO analysis
View CO analysis
PO Achieved
PO 1
PO 2
PO 3
PO 4
PO 8
PO 11
PO 12
97
96
95
94
92
91
90
4:44 AM
4/27/2023

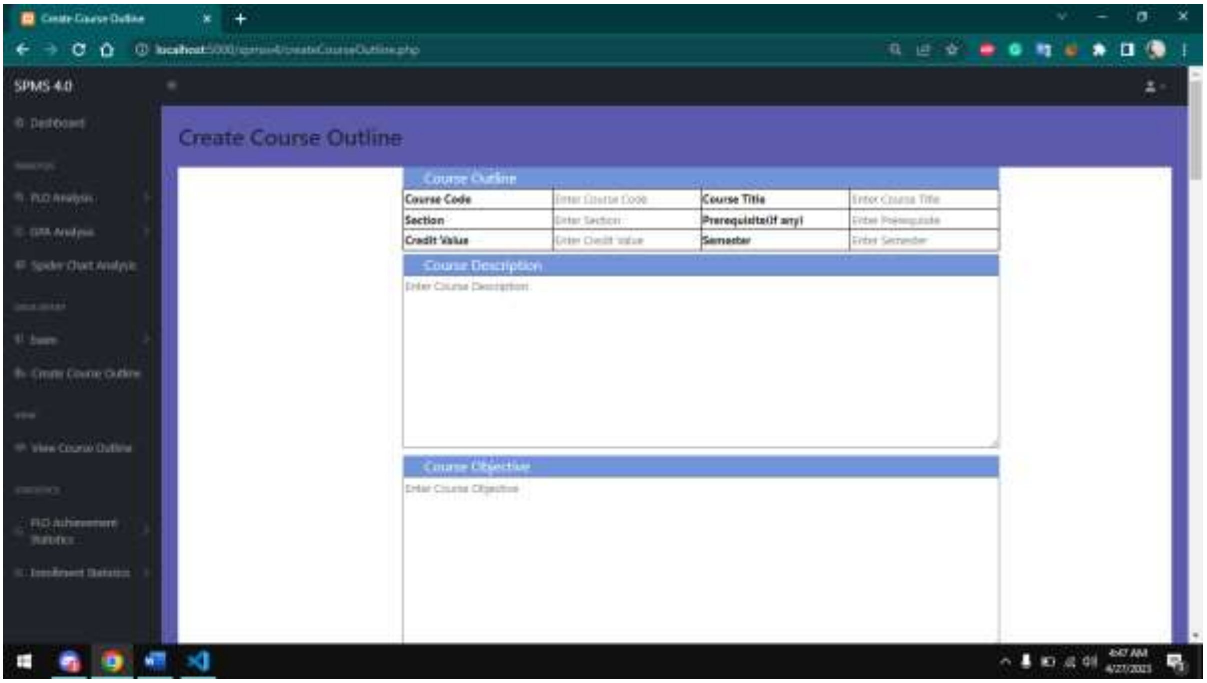


Add Exam
localhost:5000/spmsv4/addExam.php
SPMS 4.0
Dashboard
PLO Analysis
GPA Analysis
Spider Chart Analysis
Exam
Create Course Outline
View Course Outline
PLO Achievement Statistics
Enrollment Statistics
Logged in as:
Employee
Add Exam
EXAM NAME
Course
Section
No. of Questions
Semester
year
Question Number
Question Details
Mark
CO Number
SUBMIT
Copyright © Team Halfdeads
5:16 AM
4/27/2023



Create Course Outline

CSC101 | Section-1 | spring | 2021



Create Course Outline

Course Outline

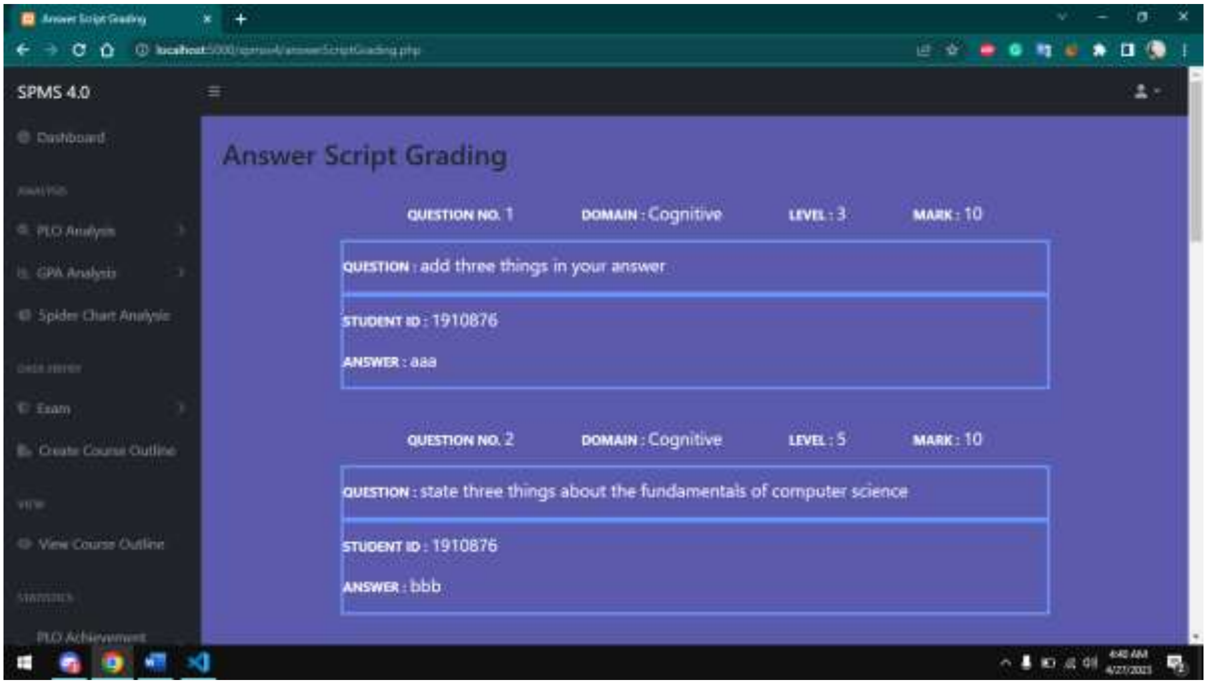
Course Code	Enter Course Code	Course Title	Enter Course Title
Section	Enter Section	Prerequisite(If any)	Enter Prerequisite
Credit Value	Enter Credit Value	Semester	Enter Semester

Course Description

Enter Course Description

Course Objective

Enter Course Objective



Answer Script Grading

QUESTION NO. 1 **DOMAIN :** Cognitive **LEVEL :** 3 **MARK :** 10

QUESTION : add three things in your answer

STUDENT ID : 1910876

ANSWER : aaa

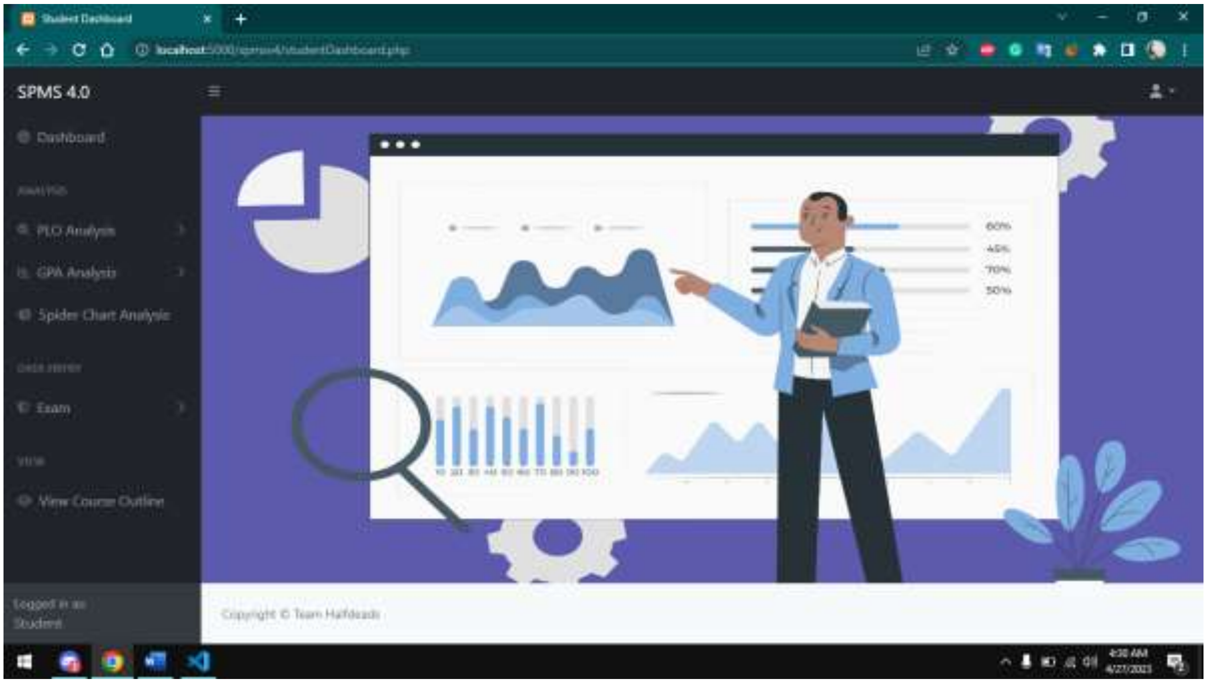
QUESTION NO. 2 **DOMAIN :** Cognitive **LEVEL :** 5 **MARK :** 10

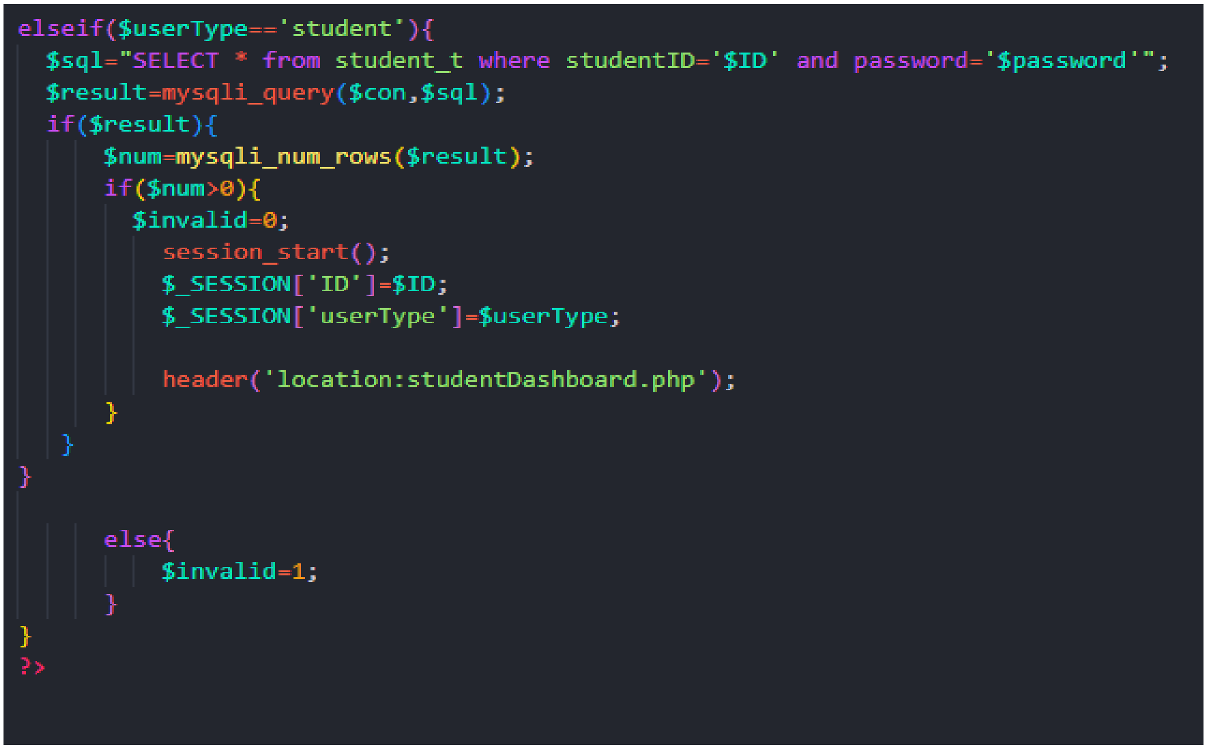
QUESTION : state three things about the fundamentals of computer science

STUDENT ID : 1910876

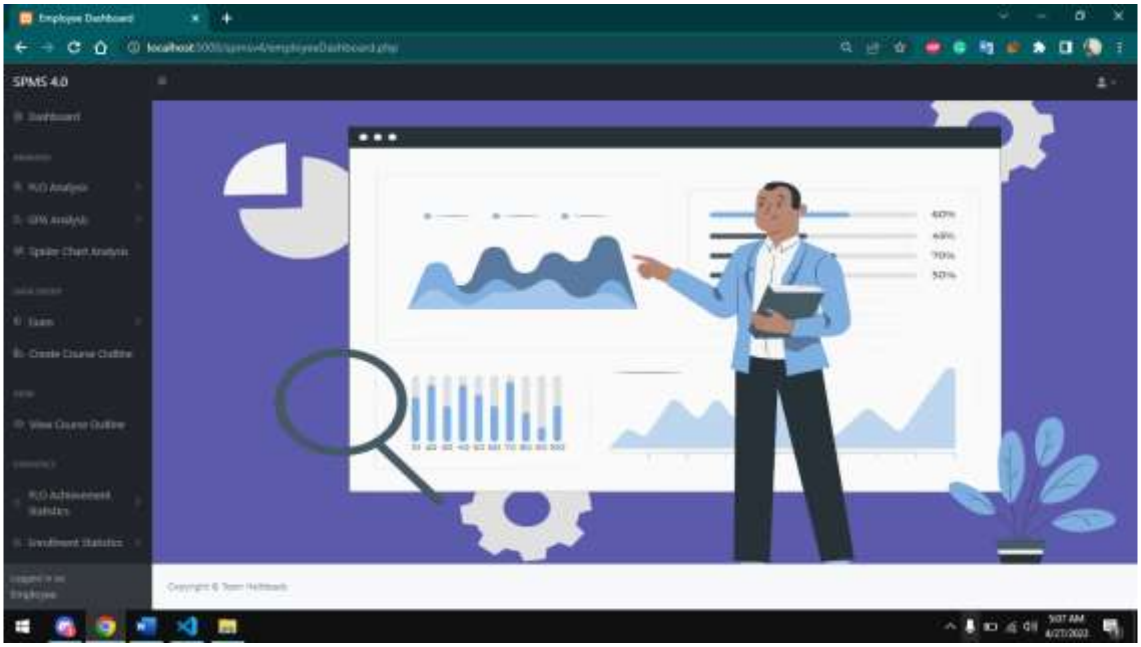
ANSWER : bbb

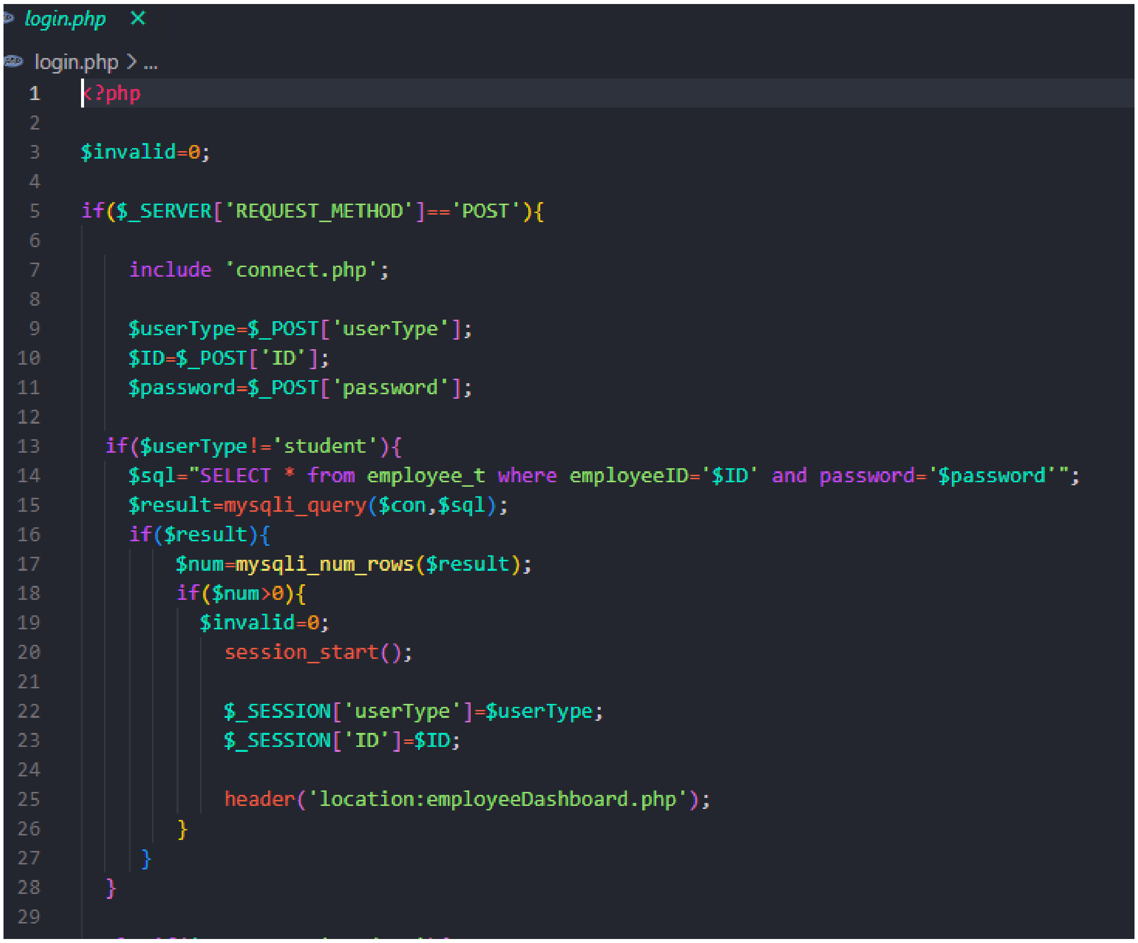
B. OUTPUT FORMS



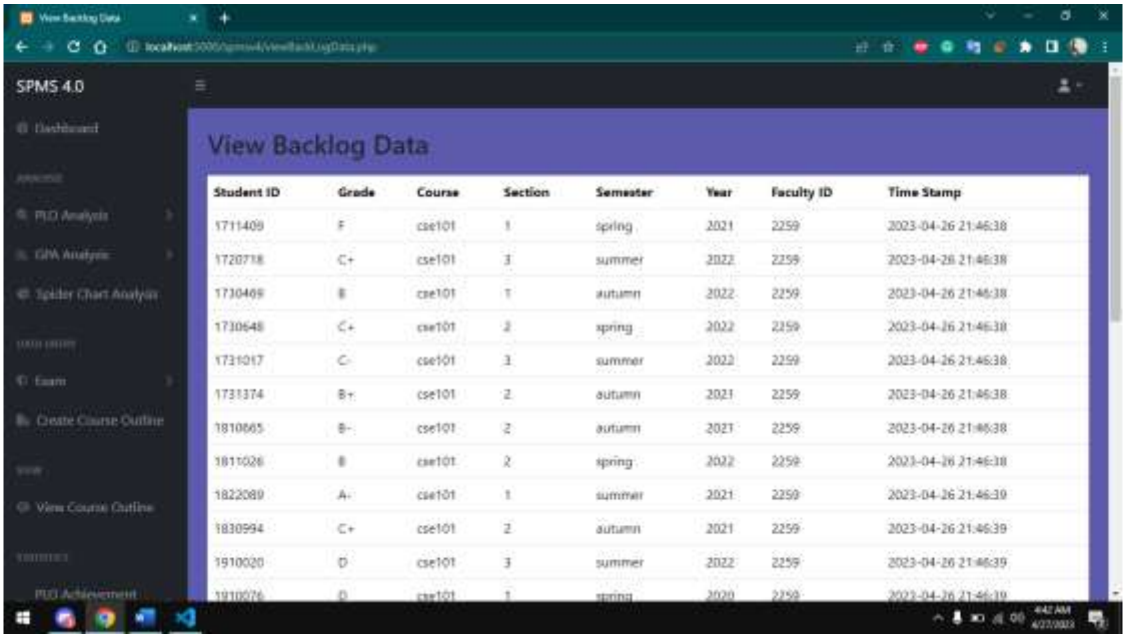


```
elseif($userType=='student'){
  $sql="SELECT * from student_t where studentID='$ID' and password='$password'";
  $result=mysqli_query($con,$sql);
  if($result){
      $num=mysqli_num_rows($result);
      if($num>0){
        $invalid=0;
          session_start();
          $_SESSION['ID']=$ID;
          $_SESSION['userType']=$userType;

          header('location:studentDashboard.php');
      }
   }
}

      else{
          $invalid=1;
      }
}
?>
```



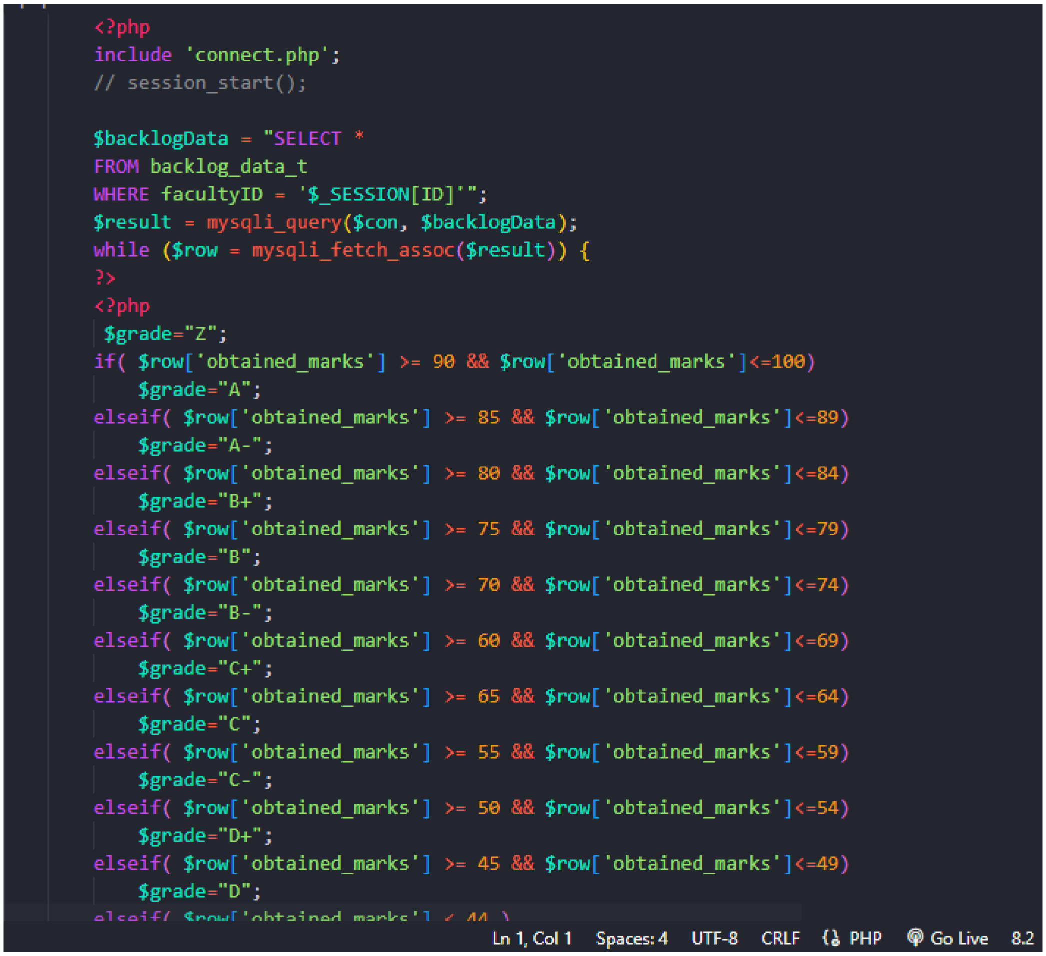


```php
<?php

$invalid=0;

if($_SERVER['REQUEST_METHOD']=='POST'){

    include 'connect.php';

    $userType=$_POST['userType'];
    $ID=$_POST['ID'];
    $password=$_POST['password'];

  if($userType!='student'){
    $sql="SELECT * from employee_t where employeeID='$ID' and password='$password'";
    $result=mysqli_query($con,$sql);
    if($result){
        $num=mysqli_num_rows($result);
        if($num>0){
          $invalid=0;
            session_start();

            $_SESSION['userType']=$userType;
            $_SESSION['ID']=$ID;

            header('location:employeeDashboard.php');
        }
    }
  }

```

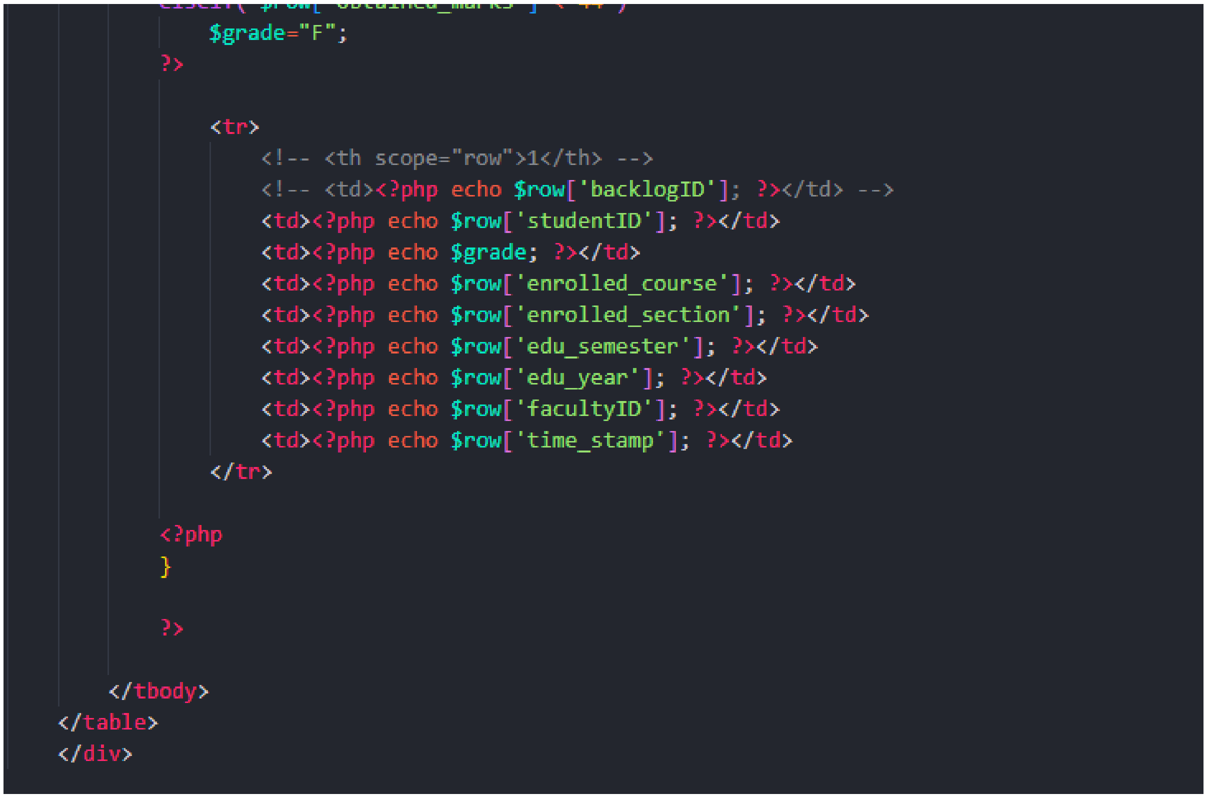


View Backlog Data

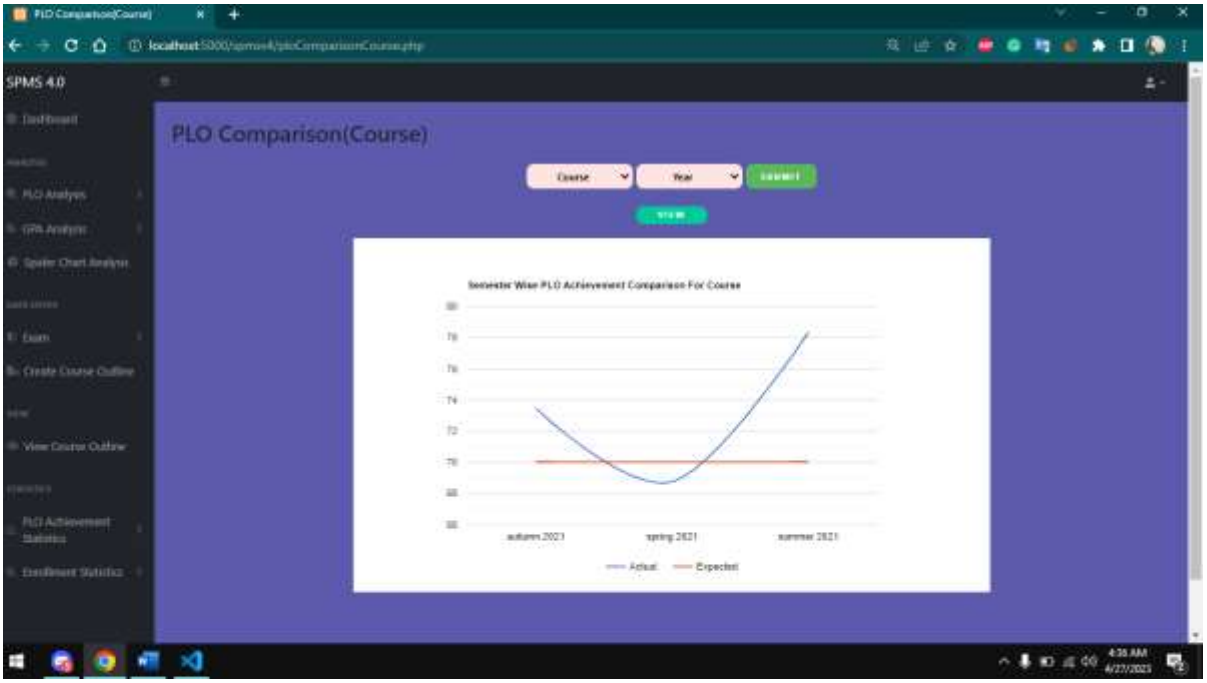
Student ID	Grade	Course	Section	Semester	Year	Faculty ID	Time Stamp
1711409	F	cse101	1	spring	2021	2259	2023-04-26 21:46:38
1720718	C+	cse101	3	summer	2022	2259	2023-04-26 21:46:38
1730469	B	cse101	1	autumn	2022	2259	2023-04-26 21:46:38
1730648	C+	cse101	2	spring	2022	2259	2023-04-26 21:46:38
1731017	C-	cse101	3	summer	2022	2259	2023-04-26 21:46:38
1731374	B+	cse101	2	autumn	2021	2259	2023-04-26 21:46:38
1810665	B-	cse101	2	autumn	2021	2259	2023-04-26 21:46:38
1811026	B	cse101	2	spring	2022	2259	2023-04-26 21:46:38
1822089	A-	cse101	1	summer	2021	2259	2023-04-26 21:46:39
1830994	C+	cse101	2	autumn	2021	2259	2023-04-26 21:46:39
1910020	D	cse101	3	summer	2022	2259	2023-04-26 21:46:39
1910076	D	cse101	1	spring	2020	2259	2023-04-26 21:46:39

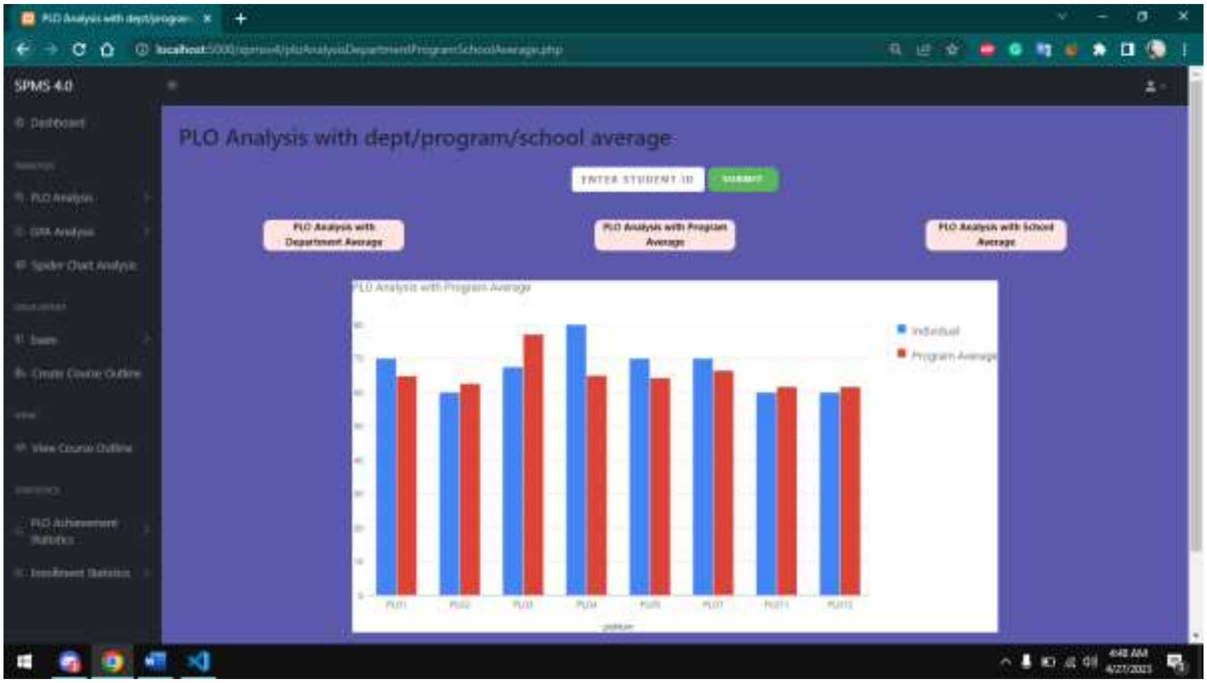


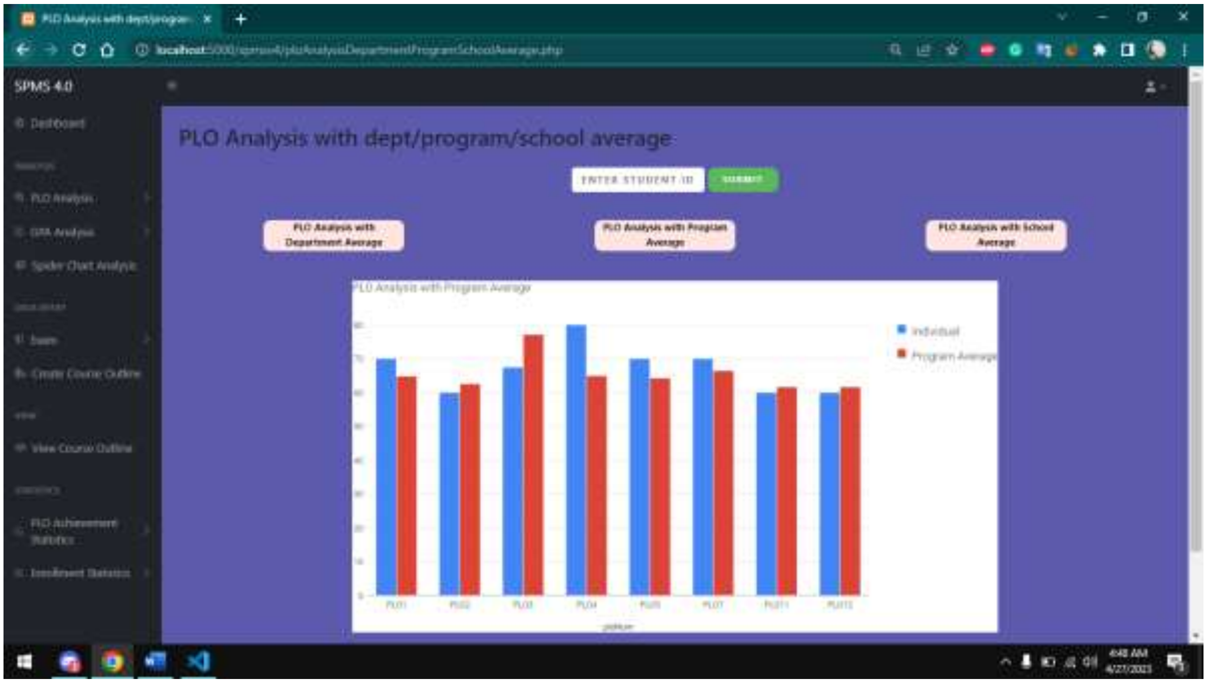
```php
<?php
include 'connect.php';
// session_start();

$backlogData = "SELECT *
FROM backlog_data_t
WHERE facultyID = '$_SESSION[ID]'";
$result = mysqli_query($con, $backlogData);
while ($row = mysqli_fetch_assoc($result)) {
?>
<?php
 $grade="Z";
if( $row['obtained_marks'] >= 90 && $row['obtained_marks']<=100)
    $grade="A";
elseif( $row['obtained_marks'] >= 85 && $row['obtained_marks']<=89)
    $grade="A-";
elseif( $row['obtained_marks'] >= 80 && $row['obtained_marks']<=84)
    $grade="B+";
elseif( $row['obtained_marks'] >= 75 && $row['obtained_marks']<=79)
    $grade="B";
elseif( $row['obtained_marks'] >= 70 && $row['obtained_marks']<=74)
    $grade="B-";
elseif( $row['obtained_marks'] >= 60 && $row['obtained_marks']<=69)
    $grade="C+";
elseif( $row['obtained_marks'] >= 65 && $row['obtained_marks']<=64)
    $grade="C";
elseif( $row['obtained_marks'] >= 55 && $row['obtained_marks']<=59)
    $grade="C-";
elseif( $row['obtained_marks'] >= 50 && $row['obtained_marks']<=54)
    $grade="D+";
elseif( $row['obtained_marks'] >= 45 && $row['obtained_marks']<=49)
    $grade="D";
elseif( $row['obtained_marks'] < 44 )
```

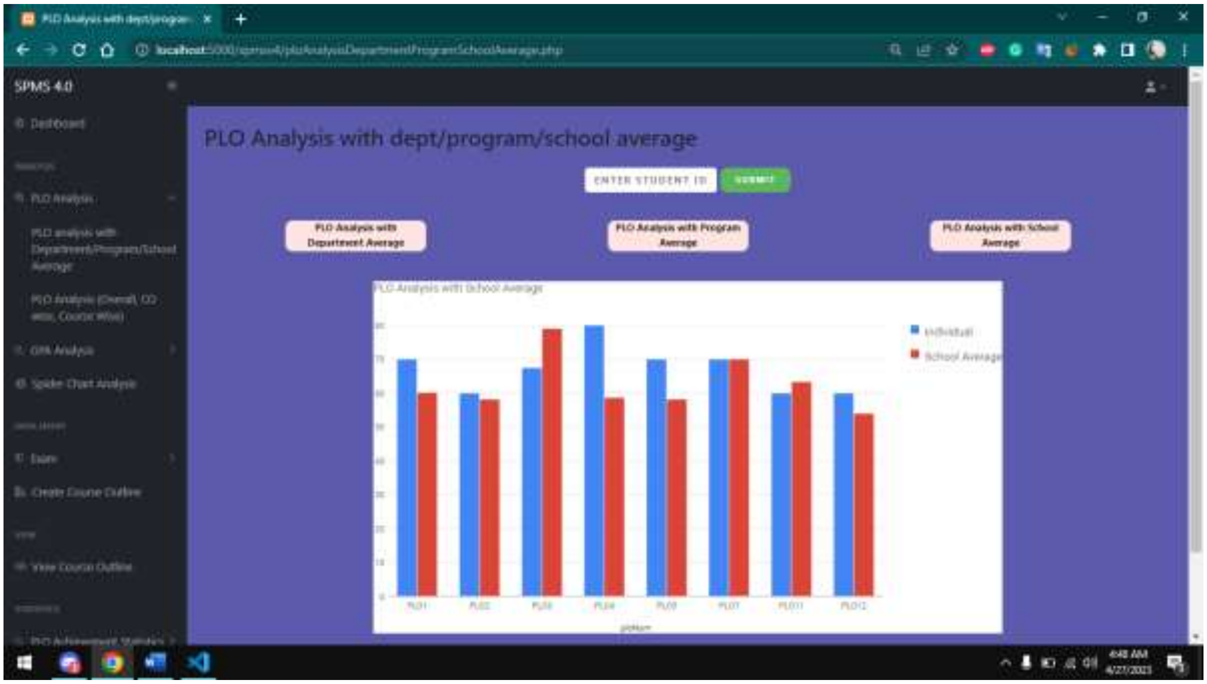


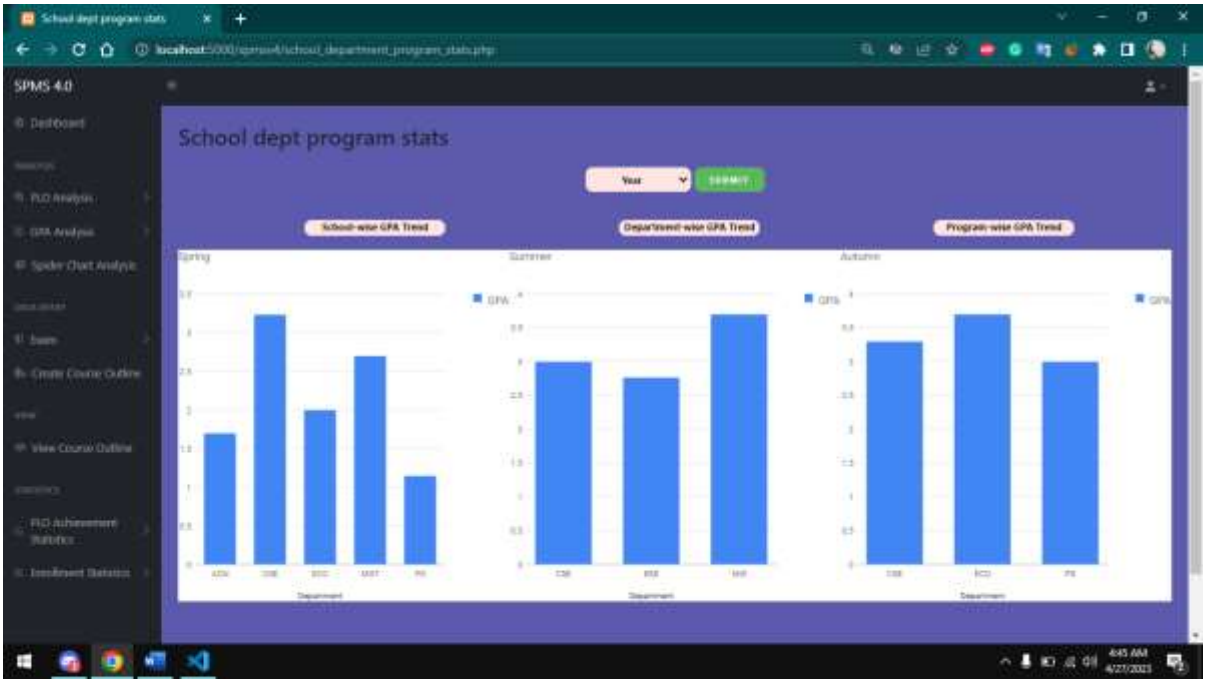
```
                $grade="F";
            ?>

                <tr>
                    <!-- <th scope="row">1</th> -->
                    <!-- <td><?php echo $row['backlogID']; ?></td> -->
                    <td><?php echo $row['studentID']; ?></td>
                    <td><?php echo $grade; ?></td>
                    <td><?php echo $row['enrolled_course']; ?></td>
                    <td><?php echo $row['enrolled_section']; ?></td>
                    <td><?php echo $row['edu_semester']; ?></td>
                    <td><?php echo $row['edu_year']; ?></td>
                    <td><?php echo $row['facultyID']; ?></td>
                    <td><?php echo $row['time_stamp']; ?></td>
                </tr>

            <?php
            }

            ?>

        </tbody>
    </table>
</div>
```

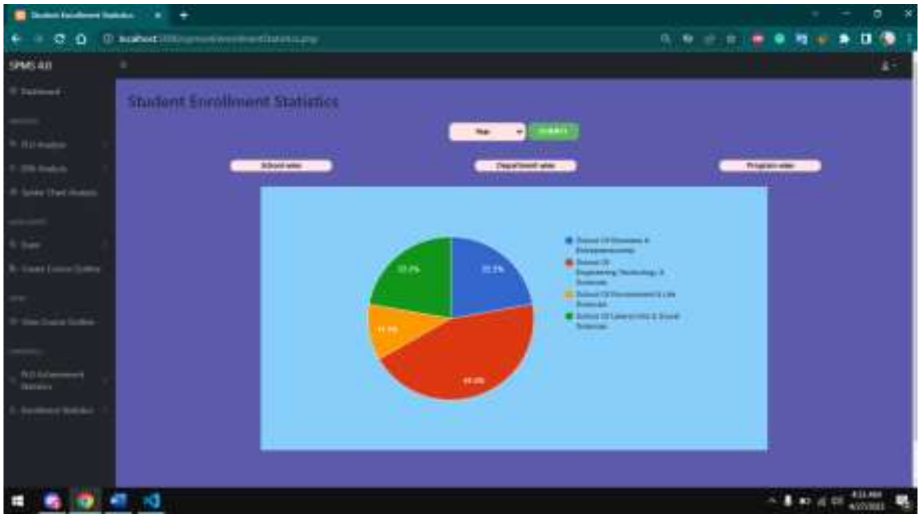

PLO Comparison(Course)
localhost:5000/spmsv4/ploComparisonCourse.php
SPMS 4.0
Dashboard
PLO Analysis
GPA Analysis
Spider Chart Analysis
Exam
Create Course Outline
View Course Outline
PLO Achievement Statistics
Enrollment Statistics
PLO Comparison(Course)
Course
Year
SUBMIT
VIEW
Semester Wise PLO Achievement Comparison For Course
80
78
76
74
72
70
68
66
autumn 2021
spring 2021
summer 2021
Actual
Expected
4:36 AM
4/27/2023

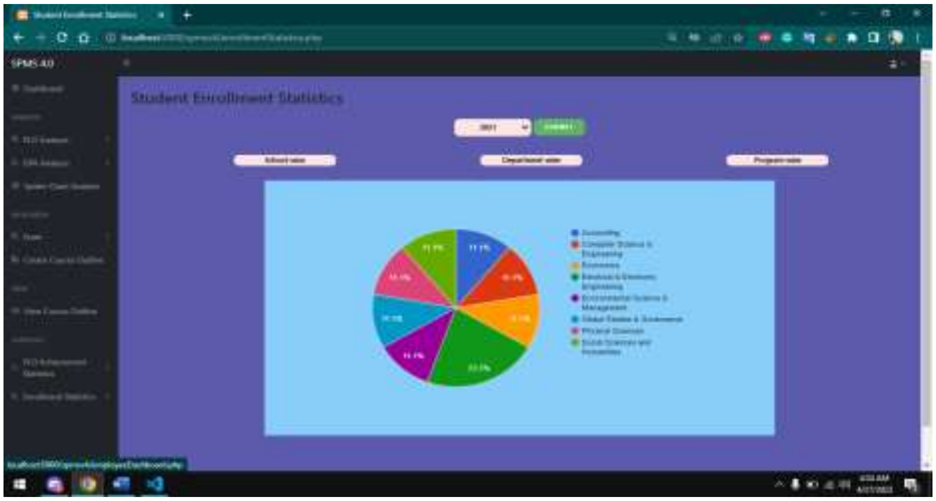

PLO Analysis with dept/program/school average
SPMS 4.0
Dashboard
PLO Analysis
GPA Analysis
Spider Chart Analysis
Exam
Create Course Outline
View Course Outline
PLO Achievement Statistics
Enrollment Statistics
ENTER STUDENT ID
SUBMIT
PLO Analysis with Department Average
PLO Analysis with Program Average
PLO Analysis with School Average
PLO Analysis with Program Average
Individual
Program Average
PLO1
PLO2
PLO3
PLO4
PLO5
PLO7
PLO11
PLO12
4:48 AM
4/27/2023

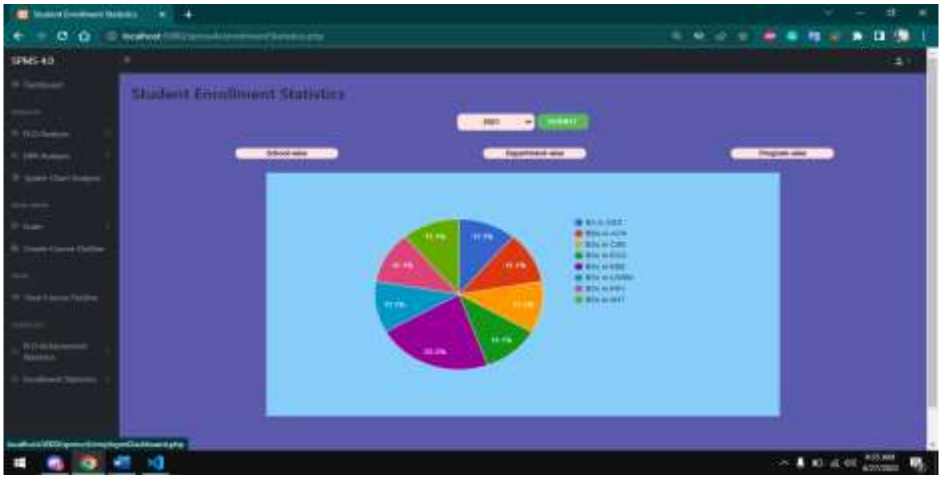

PLO Analysis with dept/program/school average
SPMS 4.0
Dashboard
PLO Analysis
GPA Analysis
Spider Chart Analysis
Exam
Create Course Outline
View Course Outline
PLO Achievement Statistics
Enrollment Statistics
ENTER STUDENT ID
SUBMIT
PLO Analysis with Department Average
PLO Analysis with Program Average
PLO Analysis with School Average
PLO Analysis with Program Average
Individual
Program Average
PLO1
PLO2
PLO3
PLO4
PLO5
PLO7
PLO11
PLO12
4:48 AM
4/27/2023


PLO Analysis with dept/program/school average
SPMS 4.0
Dashboard
PLO Analysis
PLO analysis with Department/Program/School Average
PLO Analysis (Overall, CO wise, Course Wise)
GPA Analysis
Spider Chart Analysis
Exam
Create Course Outline
View Course Outline
ENTER STUDENT ID
SUBMIT
PLO Analysis with Department Average
PLO Analysis with Program Average
PLO Analysis with School Average
PLO Analysis with School Average
Individual
School Average
PLO1
PLO2
PLO3
PLO4
PLO5
PLO7
PLO11
PLO12


School dept program stats
SPMS 4.0
Dashboard
PLO Analysis
GPA Analysis
Spider Chart Analysis
Exam
Create Course Outline
View Course Outline
PLO Achievement Statistics
Enrollment Statistics
Year
SUBMIT
School-wise GPA Trend
Department-wise GPA Trend
Program-wise GPA Trend
Spring
Summer
Autumn
GPA
GPA
GPA
Department
Department
Department


SPMS 4.0
Student Enrollment Statistics
Year
SUBMIT
School wise
Department wise
Program wise
22.2%
44.4%
11.1%
22.2%
School Of Business & Entrepreneurship
School Of Engineering, Technology & Sciences
School Of Environment & Life Sciences
School Of Liberal Arts & Social Sciences


SPMS 4.0
Student Enrollment Statistics
2021
SUBMIT
School wise
Department wise
Program wise
11.1%
11.1%
11.1%
22.2%
11.1%
11.1%
11.1%
11.1%
Accounting
Computer Science & Engineering
Economics
Electrical & Electronic Engineering
Environmental Science & Management
Global Studies & Governance
Physical Sciences
Social Sciences and Humanities


SPMS 4.0
Student Enrollment Statistics
2021
SUBMIT
School wise
Department wise
Program wise
11.1%
11.1%
11.1%
11.1%
22.2%
11.1%
11.1%
11.1%
BSc in ACN
BSc in CSE
BSc in EEE

CHAPTER-5 CONCLUSION

A. PROBLEM AND SOLUTION

Analysis Phase:

During the Analysis Phase, one of the major problems faced was the confusion around the Rich Picture and Six Element Analysis of the organizational operations since there was no data available regarding those operations. However, Faculty members and other stakeholders were interviewed in order to overcome such confusions, and information received during the interview was collected in order to get a better understanding of the system that was being developed.

Designing Phase:

Some problems were faced while creating the EERD and Relational Schema during the Design Phase, However, constant feedbacks from the faculty were enough to overcome those issues.

Implementation Phase:

All the System Requirements were completed successfully.

Front-End Developing tools: HTML, CSS, JavaScript, Google Charts,
Chart JS Back-End Developing tools: PHP, JSON
Database-integration: MySQL

Additional Features and Future Development:

One new feature could be added to this system in the near future which can monitor previous course curriculum and then provide reports and analytics based on the student's performance in that particular course to improve student performance rate.

References

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