Teacher Evaluation Assistant

Session: 2022 – 2026

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Acknowledgments

I am grateful to Allah Almighty for giving me the energy to finish this project on time.

I want to thank my supervisor, Mr Nazeef Ul Haq for his support, guidance, and helpful advice. He taught me how to manage my work better by planning ahead of time.

I would also like to express my appreciation to Mr. Nazeef Ul Haq for teaching me database SQL concepts that made completing this project easier.

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Abstract

This project aims to replace human labor using a desktop application. The current assessment of students is being done manually, which is a difficult for instructors. The system is designed to perform CRUD operations on a database schema consisting of 10 tables: Assessment, StudentResult, AssessmentComponent, Student, RubricLevel, StudentAttendance, Lookup, Rubric, ClassAttendance, and Clo. The Assessment table contains information about the assessments.The StudentResult table stores the results of the students' assessments. The Student table stores the students' personal information. The RubricLevel table defines the rubric levels.The StudentAttendance table tracks the attendance of the students. The ClassAttendance table tracks the attendance of the classesThe system also generates PDF reports that provide useful information to the instructors. Over.all, this project aims to demonstrate the use and benefits of databases in real-world problems, such as managing large amounts of data efficiently and securely.

1 Introduction

1.1 Description

The project Teacher Evaluation Assistant is designed to manage assessments, student results, rubrics, attendance, and student information. The system has a set of Assessments that consists of one or more AssessmentComponents. Rubrics are used to measure student performance.RubricLevels are used to define a set of criteria that are used to measure a student's performance on a rubric. The system keeps track of student attendance via a StudentAttendance table, which has a unique AttendanceID. Finally, the system keeps track of class attendance through a ClassAttendance table. Lookup is used to categorize the different types of information stored in the system, such as attendance and student status.

The Home page represents the summary of the whole project.I have applied 8 figures with labels and this page shows the count of students(active or inactive),clo's, rubrics, rubric levels, assessments, assessment components and reports.

Admin can add, view, delete(inactive) and update students in the student page. There are three buttons for adding, deleting and updating data. when you click the grid, then data of specific row goes to corresponding textboxes.Admin can also make students active in the assessment components page. There is one button for making students active. When you click the grid, then button becomes enabled and you can make students active. In maximum pages Sorting and searching is applied on data and all the attributes in the system are required except student's LastName and Contact.

Attendance page shows the attendance status (present, absent, leave, late) of all students.This page have two grid. One grid shows students name and registration number so that admin can mark attendance of students. I have used four check boxes in grid for marking status of students. Other grid shows the status of all the students. First date is selected from datetimepicker and attendance is viewed in grid.

Admin can add, view, delete and update clo's in the student page. There are three buttons for adding, deleting and updating data. when you click the grid, then clo name goes to respective textbox.Admin can add, view, delete and update rubrics in the rubric page. There are three buttons for adding, deleting and updating data. When you click the grid, then data of specific row goes to corresponding textboxes. Admin can add, view, delete and update rubric levels in the rubric level page. There are three buttons for adding, deleting and updating data. When you click the grid, then data of specific row goes to corresponding textboxes.

Admin can add, view, delete and update students in the assessment page. There are three buttons for adding, deleting and updating data. When you click the grid, then data of specific row goes to corresponding textboxes.Admin can add, view, delete and update students in the assessment components page. There are three buttons for adding, deleting and updating data. When you click the grid, then data of specific row goes to corresponding textboxes.

Admin can download six reports in reports page that are Assessment wise Report, Clo Wise Report,Student wise Report, Overall Clo's Report, Monthly Attendance Report and Daily Attendance Report. I have also used three grids that shows the data of reports side by side by generating reports.

1.2 Motivation

The main motivation of this project is to practice sql queries. This project is completed using simple and complex queries. My motivation is to get data from relation by using sql queries. I have used Csharp and Transact Structured Query Language in my project and applied Complex queries to genarate PDF Reports using pdfSharp library.

1.3 Target Audience

The target audience for the Teacher Evaluation Assistant system are the teachers that were evaluating the students manually. This will help instructors to manage students, clo's , rubric's, rubric level's, asessment's, assessment components's data. The system will be able to generate result of students. The pdf reports are generated and it becomes easy for instructors to see the obtained marks of students. He will be able to see assessment wise, clo wise report. This system makes comfortable for instructors that he can view data of specific student by generating report.Proper attendance system is managed in the project. Instructor can be able to mark attendance of students. He will also be able to set leave and late status of student along with present and absent status.

2 Technology Stack

Language	T-SQL and C#
IDEs	Visual Studio 2022 Community Edition
UserInterface	Winform (MaterialSkin) (GunaUI)
PDF	iText.sharp

3 Links

Gitlab Repository	Click Here

4 Operational Details

Teacher Evaluation Assistant system is single user i.e instructor or admin. It has following operational details:

1. The admin will be able to add students data. He is able to view, update and delete students. In Deletion procedure admin changes the status of student i.e. InActive.
2. The admin will be able to add CLO's. He is able to view, update and delete Clo's.

3. The admin will be able to add rubrics. He is able to view, update and delete rubrics.
4. The admin will be able to add rubric levels. He is able to view, update and delete rubric levels. He will give measurement level to rubrics.
5. The admin will be able to add Assessments. He is able to view, update and delete Assessments.
6. The admin will be able to add Assessment Components data. He is able to view, update and delete assessment Components.
7. The admin will be able to to evaluate students. He will be able to view, update evaluation.
8. The admin will be able to mark attendance of students. He will also able to view and update students.
9. The admin will be to generate pdf reports.

5 Database Design

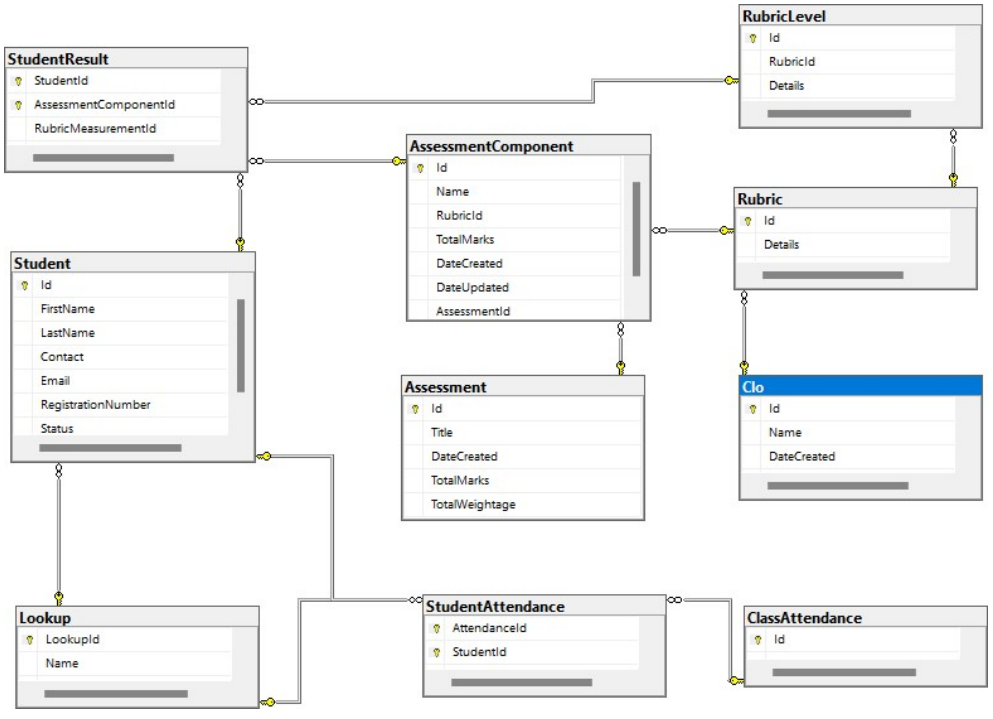

FIGURE 1: Database Diagram

5.1 Lookup

This relation consists of LookupId, Name and category. There are two types of categories i.e. 1)AttendanceStatus(Present=1, Absent=2, Leave=3, Late=4) 2)StudentStatus(Active=5, InActive=6)

5.2 Student

This relation has attributes i.e. Id, FirstName, LastName, Contact,Email, RegistrationNumber and Status.Here Id is a primary key and all values are required except Lastname and Contact.

5.3 StudentAttendance

This relation has three attributes i.e. AttendanceId, StudentId, AttendanceStatus. Attendance status may be present, absent, leave, late. Primary key is AttendanceId,StudentId and we determine other attributes basis on it.

5.4 ClassAttendance

This relation has two attributes i.e. Id, AttendanceDate. Here Id is a primary key and attendance of all student marked on specific date is stored in this relation.

5.5 Clo

This relation has four attributes i.e. Id, Name, DateCreated, DateUpdated. Here Id is a primary key due to which Rubric relation is connected with Clo relation. dateCreated and Dateupdated is dates of creation and updation respectively.

5.6 Rubric

This relation has three attributes i.e. Id, Details, CloId. Here Id is a primary key due to which Rubric relation is connected with RubricLevel and AssessmentComponent.

5.7 RubricLevel

This relation has four attributes i.e. Id, RubricId, Details, MeasurementLevel. Here Id is primary key and Rubric level is connected with Studentresult through it.

5.8 Assessment

This relation has five attributes i.e. Id, Title, Datecreated, TotalMarks, TotalWeightage. Here Assessment is a primary key due to which Assessment relation is connected with AssessmentComponent.

5.9 AssessmentComponent

This relation has seven attributes i.e. Id, Name, RubricId, TotalMarks, DateCreated, DateUpdated, AssessmentId. Here Id is a primary key and AssessmentComponent is connected with StudentResult

and Rubric.

5.10 StudentResult

This relation has four attributes i.e. StudentId, AssessmentComponentId, RubricMeasurementId,EvaluationDate.Here StudentId, AssessmentComponentId becomes primary key.

6 ActivityFlowDiagram

6.1 Studentw

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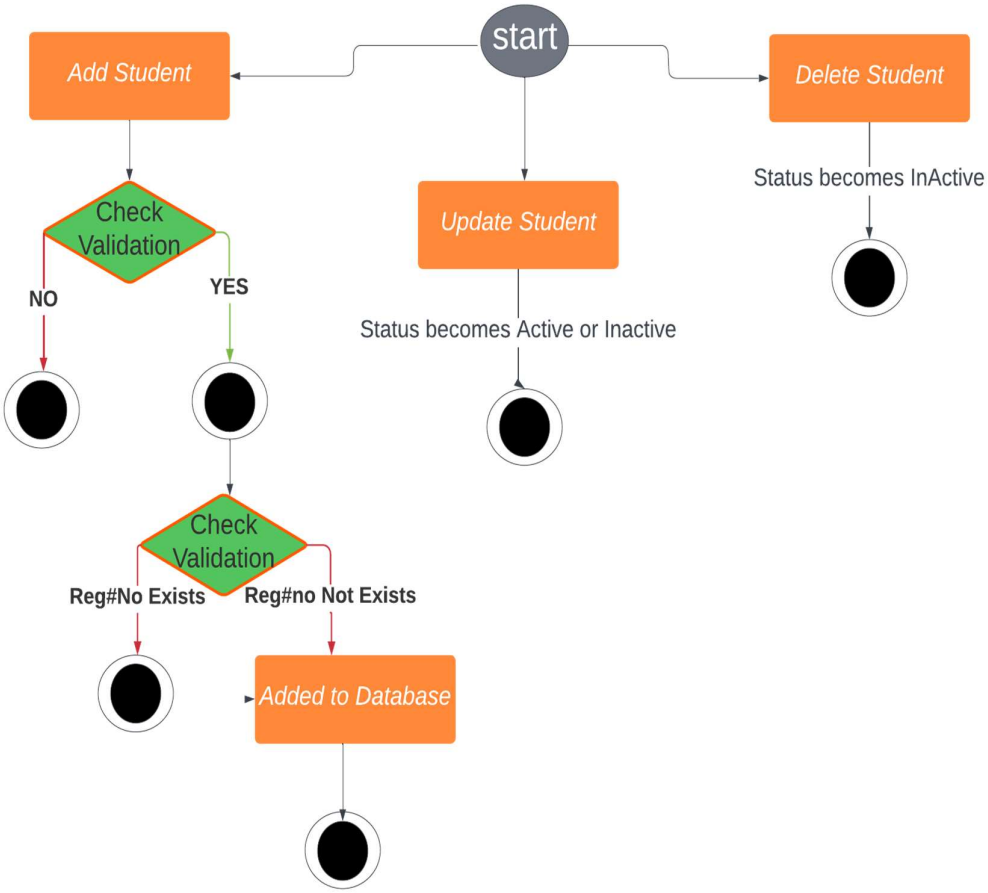

FIGURE 2: Flow diagram of managing students

6.2 Clo

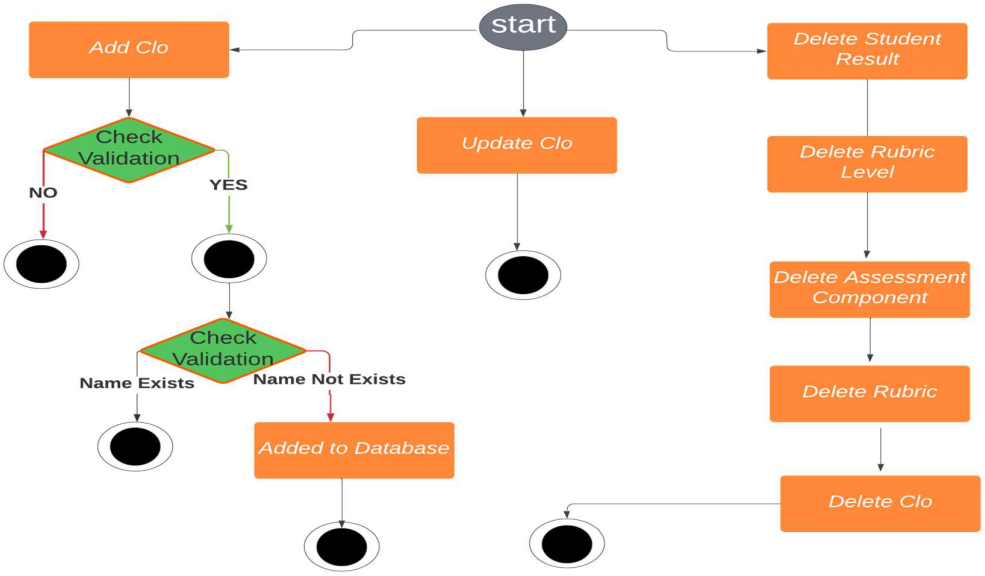

FIGURE 3: Flow diagram of managing clo

6.3 Rubric

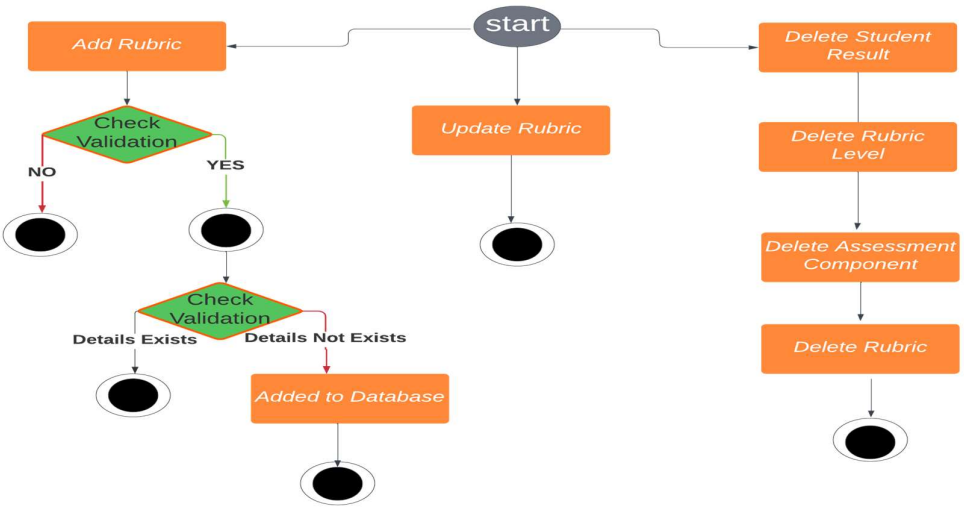

FIGURE 4: Flow diagram of managing rubric

6.4 RubricLevel

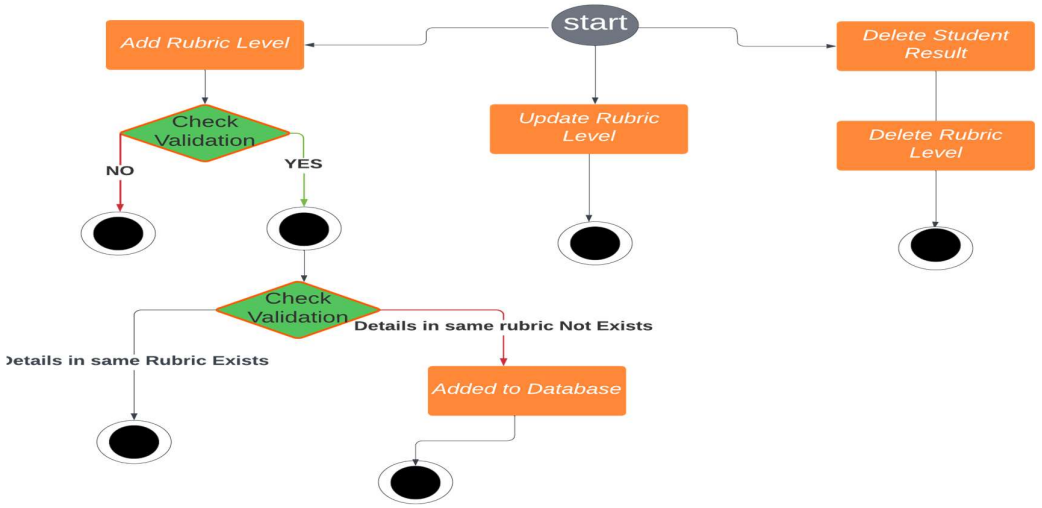

FIGURE 5: Flow diagram of managing rubric levels

6.5 Assessment

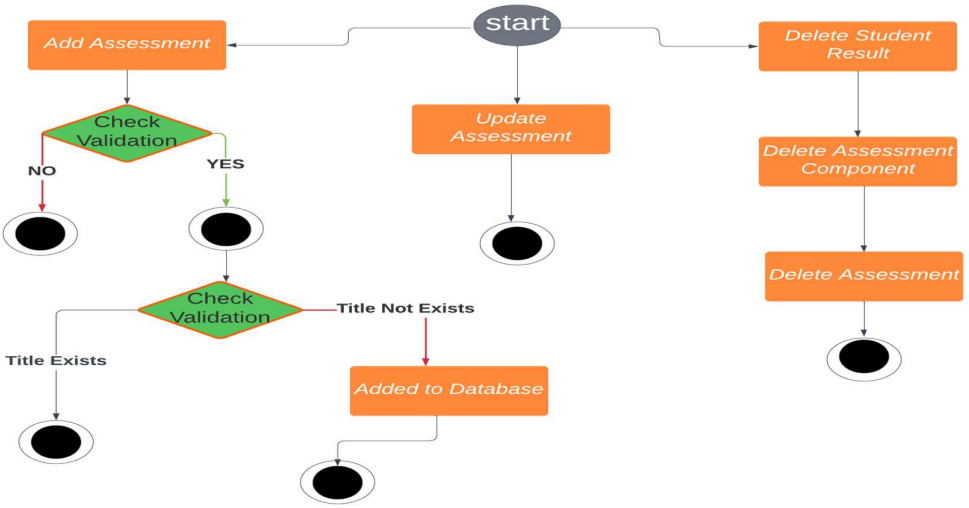

FIGURE 6: Flow diagram of managing Assessments

6.6 AssessmentComponent

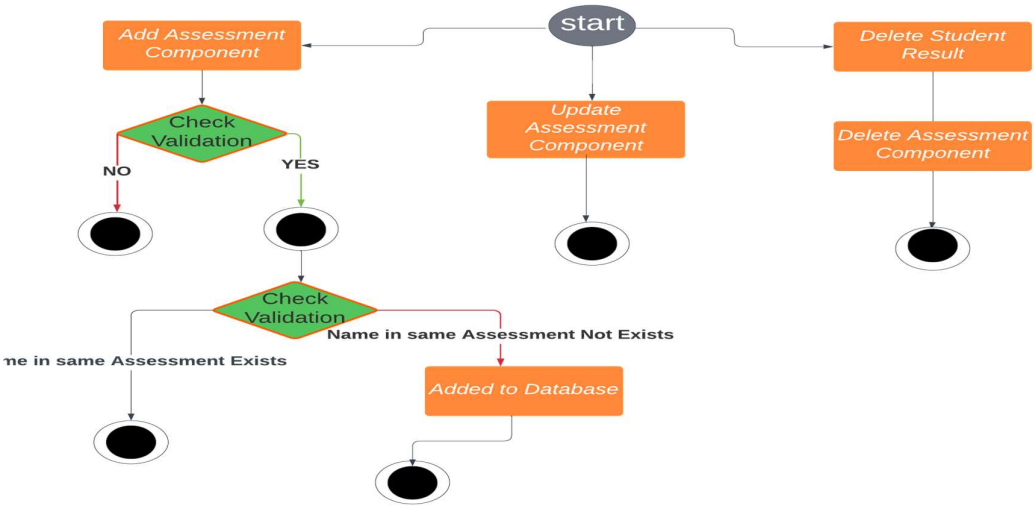

FIGURE 7: Flow diagram of managing Assessment Components

7 UserInterface

7.1 Dashboard

The dashboard represents the summary of the whole project. I have applied 4 figures with labels and this page shows the count of students(active or inactive),clo's, rubrics and total students.

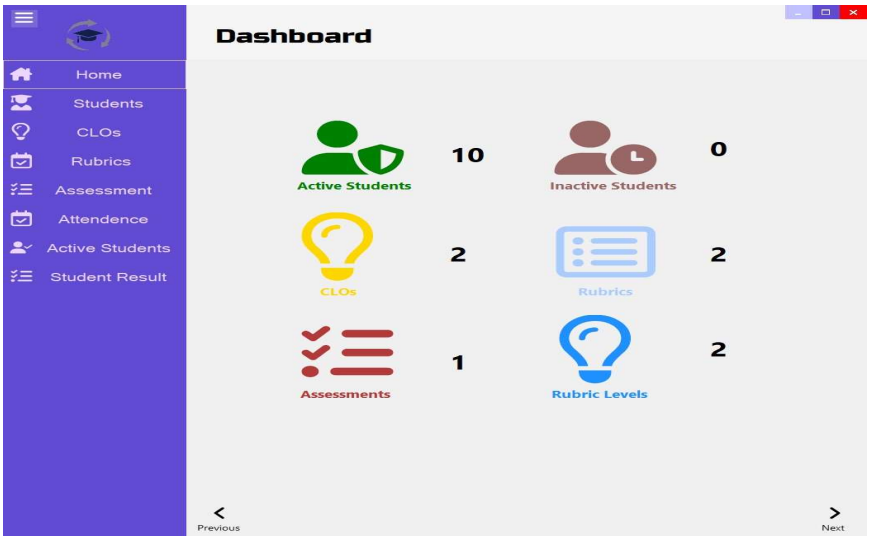

FIGURE 8: Manage(Total Students , Total Active Students , Total CLOs , Total Rubrics

7.2 Students

Admin can add, view, delete(inActives) and update students in the student page.

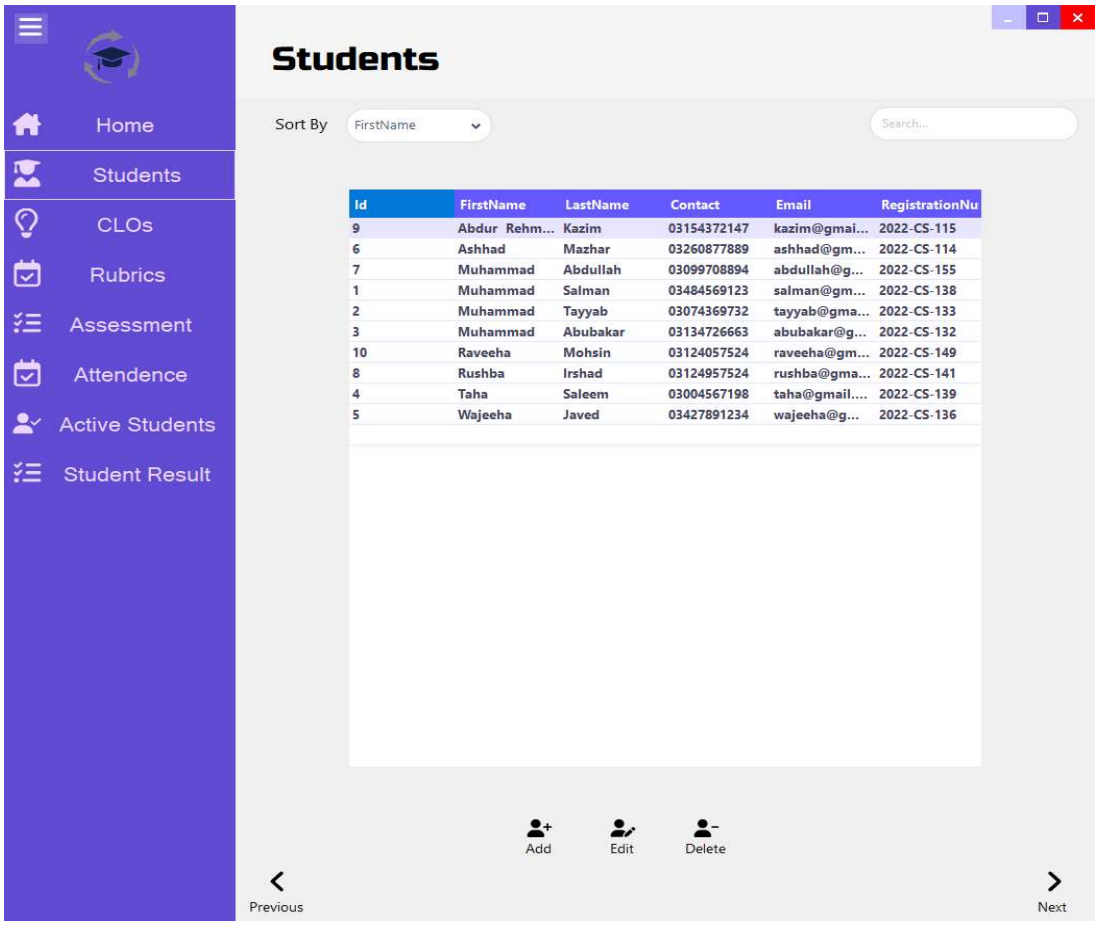

FIGURE 9: Manage(Add,View,Delete(InActive),Update Student

7.3 Attendance

Attendance page shows the attendance status (present, absent, leave, late) of all students.

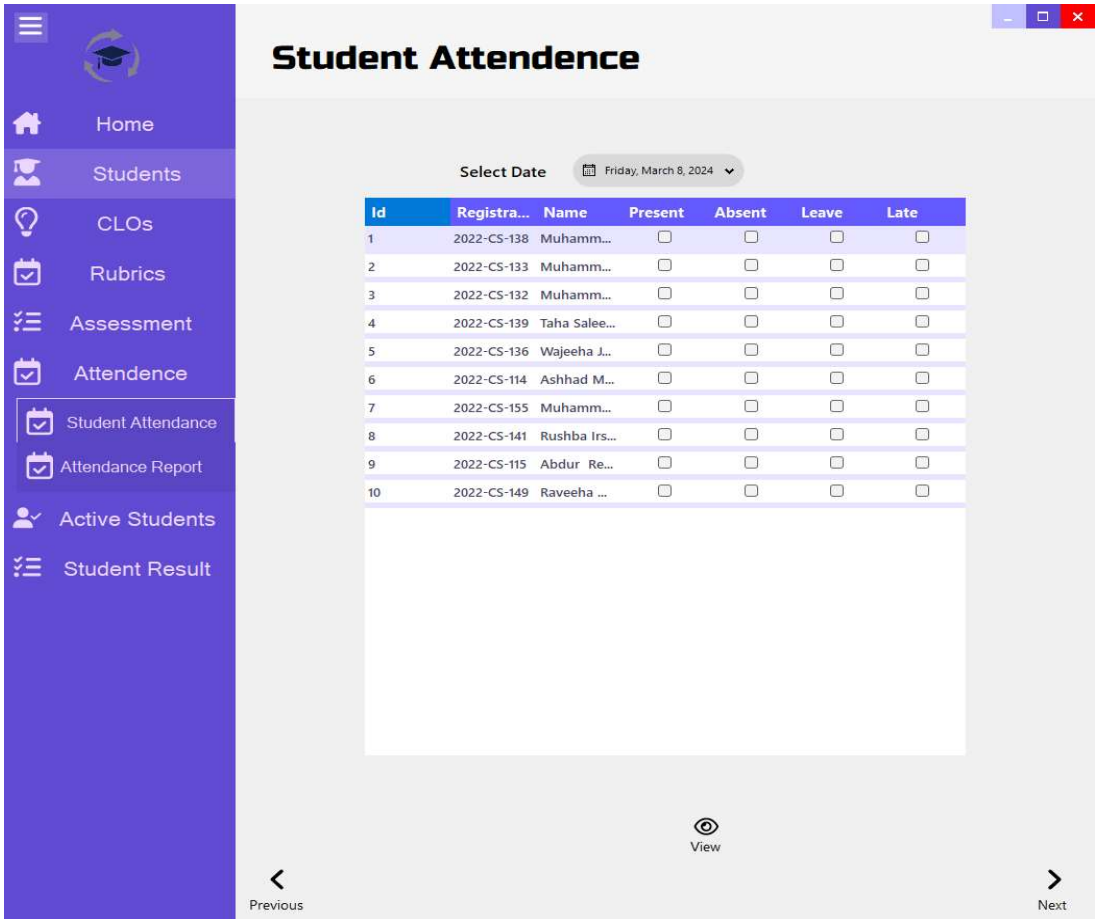

FIGURE 10: Mark, View and update Attendance

7.4 Clo

Admin can add, view, delete and update clo's in the student page.

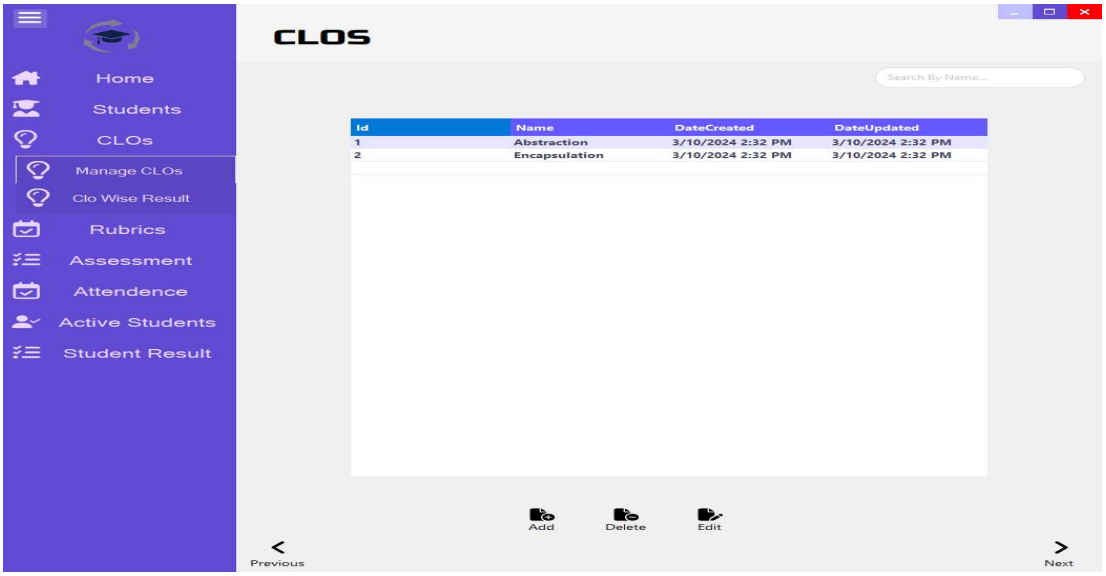

FIGURE 11: Add,View,Delete,Update Clo's

7.5 Rubric

Admin can add, view, delete and update rubrics in the rubric page.

FIGURE 12: Add,view,Delete,Update Rubrics

7.6 RubricLevel

Admin can add, view, delete and update rubric levels in the rubric level page.

FIGURE 13: Add,view,Delete,Update Rubric Levels

7.7 Assessment

Admin can add, view, delete and update students in the assessment page.

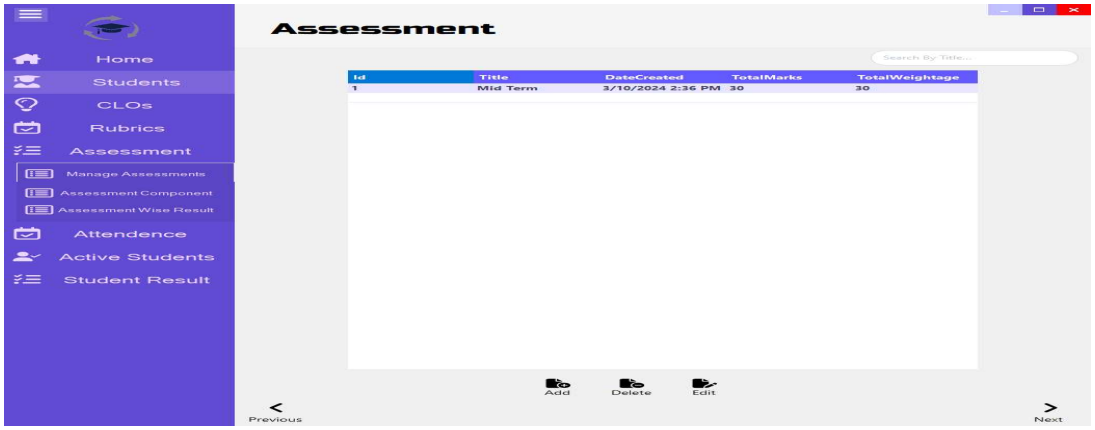

FIGURE 14: Add,view,Delete,Update Assessments

7.8 AssessmentComponent

Admin can add, view, delete and update students in the assessment components page.

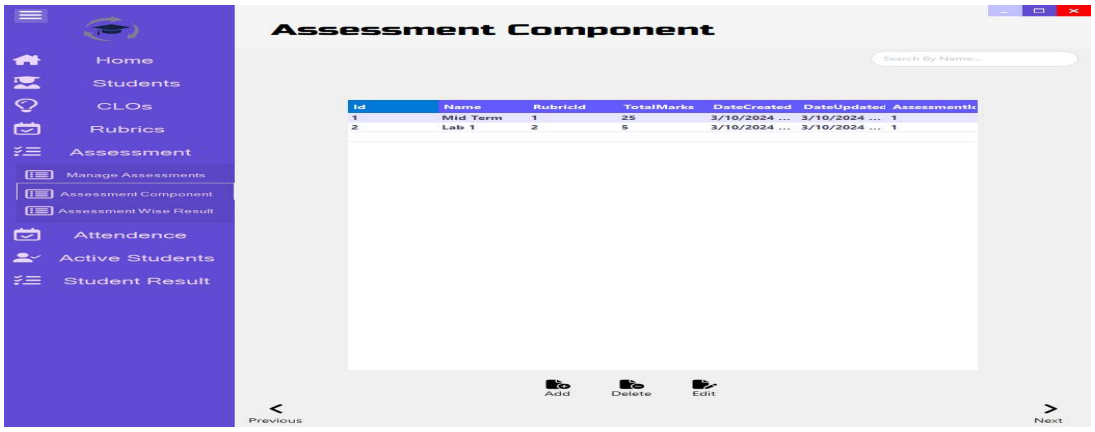

FIGURE 15: Add,view,Delete,Update Assessments Components

7.9 StudentResult

At StudentResult Page The result will be calculated according to clo rubric and rubric level.

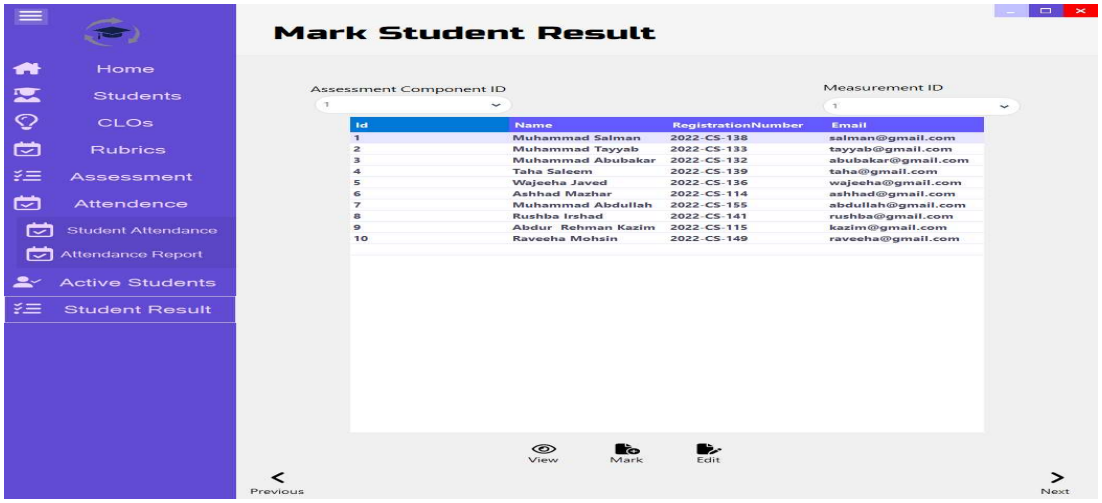

FIGURE 16: Add, Update evaluation of students

8 GeneratedPDFReports

8.1 AssessmentWiseReport

8.1.1 Query

```
WITH NewTable AS
("Select Stu.RegistrationNumber,Stu.FirstName + ' ' + Stu.LastName as Name
,R.Details as Rubric,A.Title,sum(AC.TotalMarks) as [Total Marks],
RL.Details as [Rubric Level Details],
sum(cast(RL.MeasurementLevel * AC.TotalMarks / 4 as decimal(10, 2))) as [Obtained Marks]
FROM StudentResult StuR
JOIN
Student Stu ON Stu.Id = StuR.StudentId
JOIN
RubricLevel RL ON StuR.RubricMeasurementId = RL.Id
JOIn
AssessmentComponent AC ON AC.Id = StuR.AssessmentComponentId
JOIN
Assessment A ON A.Id = AC.AssessmentId
JOIN
Rubric R ON R.Id = RL.RubricId
Where A.Title = '" + assessment + "'
Group by A.Title,Stu.RegistrationNumber,Stu.FirstName,Stu.LastName,R.Details , RL.Details";
```

LISTING 1: Calculates the obtained marks and weightage for a specific assessment component of a student

FIGURE 17: Assessment Wise Reports

8.2 CLOWiseReport

8.2.1 Query

```
WITH NewTable AS
( "  Select Stu.RegistrationNumber,
Stu.FirstName + ' '+ Stu.LastName as [Student Name],Clo.Name,sum(AC.TotalMarks) as [Total Marks]
,sum(cast( RL.MeasurementLevel*AC.TotalMarks/4 as decimal(10,2))) as [Obtained Marks]
\r\n  FROM StudentResult StuR\r\n  JOIN Student Stu ON Stu.Id=StuR.StudentId\r\n
JOIN RubricLevel RL\r\n  ON StuR.RubricMeasurementId=RL.Id\r\n
JOIn AssessmentComponent AC \r\n  ON AC.Id=StuR.AssessmentComponentId\r\n
JOIN Assessment A\r\n  ON A.Id=AC.AssessmentId\r\n
JOIN  Rubric  R  \r\n  ON  R.Id=RL.RubricId\r\n
JOIN Clo\r\n  On Clo.Id=R.CloId\r\n
Where Clo.Id='" + int.Parse(cmbxCloWise.SelectedValue.ToString()) + "'\r\n
Group By Stu.Id,Stu.RegistrationNumber,stu.FirstName,stu.LastName,Clo.Id,Clo.Name";
```

LISTING 2: Filters the results based on a specific CLO ID.

FIGURE 18: CLO Wise Reports

8.3 AttendanceReport

8.3.1 Query

```
"DECLARE @cols AS NVARCHAR(MAX), @query AS NVARCHAR(MAX)\r\nWITH DateList AS
(\r\n  SELECT DISTINCT FORMAT(CC.AttendanceDate, 'dd/MM/yyyy') AS AttendanceDateFormatted\r\n
FROM ClassAttendance CC\r\n)\r\nSELECT @cols = STUFF
((SELECT distinct ',' + QUOTENAME(AttendanceDateFormatted)\r\nFROM DateList\r\nFOR XML PATH(''),
TYPE\r\n).value('.', 'NVARCHAR(MAX)')\r\n,1,1,'')\r\n\r\
nSET  @query  =  'SELECT  RegistrationNumber,  FirstName,  LastName,  '  +  @cols  +  '\r\n
FROM\r\n(\r\nSELECT s.RegistrationNumber, s.FirstName as FirstName,
s.LastName  as  LastName,\r\nFORMAT(ca.AttendanceDate,  ''dd/MM/yyyy'')  AS
AttendanceDateFormatted,\r\nISNULL(L.Name, ''N/A'') AS AttendanceStatus\r\n
FROM student s\r\nLEFT
JOIN StudentAttendance sa ON s.Id = sa.StudentId\r\n
JOIN ClassAttendance CA ON CA.Id = SA.AttendanceId\r\nLEFT
JOIN Lookup L ON L.LookupId = SA.AttendanceStatus\r\n) AS source_table\r\nPIVOT\r\n(\r\nMAX(AttendanceSta
FOR AttendanceDateFormatted IN (' + @cols + ')\r\n) AS pivot_table'\r\n\r\nEXECUTE(@query)\r\n";
```

LISTING 3: Shows the attendance status of all students on specific date

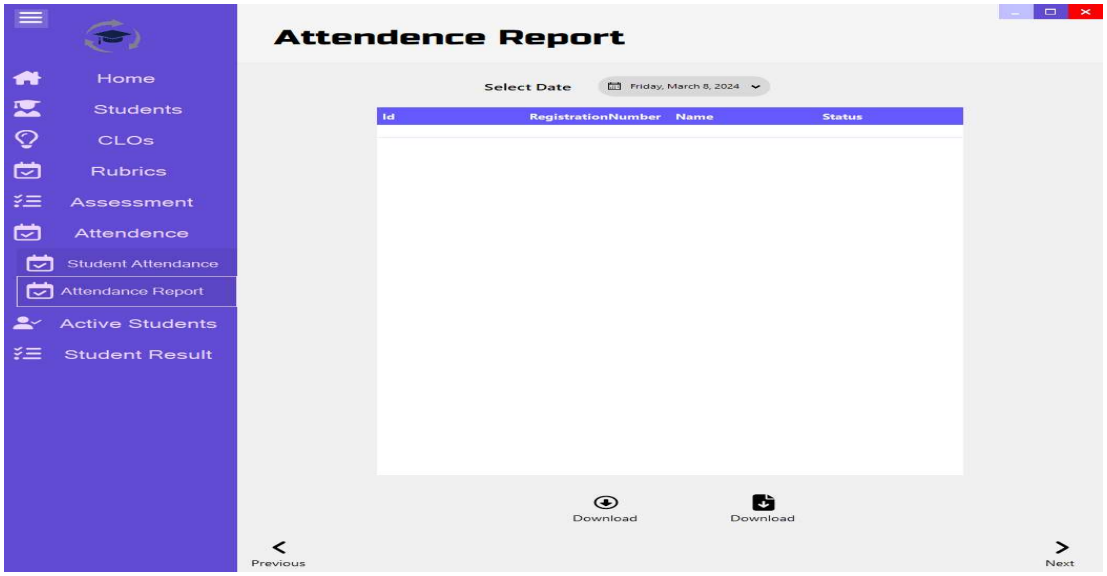

FIGURE 19: Daily Attendance Reports

9 Testing

I have applied three testing phases for finding the errors in project.

9.1 Testing Phase 1 1

Problem: I have to face problems during the deletion of Clo, rubric,rubric levels, assessment because I have to face the error due to foreign key.

Solution: This error is resolved by deleting that components on which major component depends.

For Clo Deletion

First Delete StudentResult–> AssessmentComponent–>RubricLevel–>Rubric–>Clo

For Rubric Deletion

First Delete StudentResult–> AssessmentComponent–>RubricLevel–>Rubric

For Rubric Level Deletion

First Delete StudentResult–>RubricLevel

For Assessment Component Deletion

First Delete StudentResult–>AssessmentComponent

9.2 Testing Phase 2

Problem: I have to face problems that duplicate data is adding in database.

Solution: This is resolved by writing an sql query that find the count of data. If count of existing data is zero then data can be added otherwise, it cannot be added.

9.3 Testing Phase 3

Problem: I have rechecked the complete project once again and find error in searching of assessment.

Solution: I have called the wrong event, when i change the event, error is resolved.

9.4 Testing Phase 4

Problem: In fourth phase I added the correct data in the project database and solved some small problems.

Solution: I have resolved the issue of spacing, report generating and many more.

10 Limitations

Following are the limitations of learning management system:

1. This application is for single user and has not signUp, SignIn functionality.
2. At this form the the application accepts only those phone numbers that are affiliated with Pakistan.
3. I have generated monthly attendance report tat shows the count but it is not up to the mark.
4. The concepts of Object Oriented programming is not used.

11 FutureWork

The future work that can be done on this system are given below:

1. I will make signIn, signUp application in future so that the application can be used for many users.

2. I will change that the system accepts all formats of contact number no matter that the phone number is belongs to which country.
3. I will apply all the Object Oriented Programming Features.
4. I will make attendance report in such a way that we can see the status of students in a proper manner.

12 Collaboration

The project is successfully completed by discussing it with my session fellows and our supervisor, Mr. Nauman Babar. He helped us understand the case study and explained the database schema and relationships between different database tables. He also provided us with a database diagram to give us a better understanding of the schema. Our main objective was to understand the schema well enough to understand the connections between the different tables. We were able to discuss any problems we had with the supervisor and he helped us to complete the project.

13 Conclusion

In conclusion, this project aims to address the difficulties faced by instructors in assessing student performance manually. The proposed solution involves the development of a desktop application that performs CRUD operations on a database schema. By automating the process of student assessment, the system aims to replace human labor and increase efficiency. Additionally, the system generates PDF reports that provide useful information to the instructors. Overall, this project highlights the benefits of databases in real-world problems by managing large amounts of data efficiently and securely