



Department of Computer Science  
University of Engineering and Technology Lahore  
Pakistan

---

## Rubric Management System

---

*Submitted by:*  
Student Name  
Student Registration

*Submitted to:*  
Mr. Nazeef Ul Haq

December 11, 2024

# Contents

	Page
<b>List of Tables</b>	<b>iii</b>
<b>List of Figures</b>	<b>v</b>
<b>1 Overview</b>	<b>1</b>
1.1 Description . . . . .	1
1.2 Business case . . . . .	1
1.3 Motivation . . . . .	1
1.4 Audience . . . . .	1
1.5 Features . . . . .	1
1.6 Technology stack . . . . .	2
<b>2 Use cases</b>	<b>2</b>
2.1 Home Screen . . . . .	2
2.2 Add Student . . . . .	3
2.3 View Student . . . . .	4
2.4 Delete (Update) Student . . . . .	5
2.5 Add Clo . . . . .	6
2.6 View Clo . . . . .	7
2.7 Delete (Update) CLO . . . . .	8
2.8 Map Rubric with CLO . . . . .	9
2.9 View All Rubrics . . . . .	10
2.10 Delete (Update) Rubric . . . . .	11
2.11 Map Rubric Levels with Rubrics . . . . .	12
2.12 View All Rubrics Levels . . . . .	13
2.13 Delete (Update) Rubric Level . . . . .	14
2.14 Create Assessments . . . . .	15
2.15 View All Assessments . . . . .	16
2.16 Delete (Update) Assessment . . . . .	17
2.17 Add Assessment Components . . . . .	18
2.18 View All Assessment Components . . . . .	19
2.19 Delete (Update) Assessment Components . . . . .	20
2.20 Evaluate Assessment . . . . .	21
2.21 Add Class Student . . . . .	22
2.22 View All Class Student . . . . .	23
2.23 Delete (Update) Class Student . . . . .	24
2.24 Mark Student Attendance . . . . .	25
2.25 View All Student Attendance . . . . .	26
2.26 Delete (Update) Student Attendance . . . . .	27
2.27 Assessment Wise Report . . . . .	28
2.28 CLO Wise Report . . . . .	29
2.29 Attendance Report of certain Date . . . . .	30
2.30 Report of All Assessment of a Student . . . . .	31
2.31 Report of All Attendances of a Student . . . . .	32
2.32 Light & Dark Theme . . . . .	33
<b>3 Pdf Generation Methodology</b>	<b>34</b>
<b>4 PDF Reports</b>	<b>34</b>
4.1 Assessment Wise Report . . . . .	35
4.2 CLO Wise Report . . . . .	35
4.3 Attendance Report . . . . .	37
4.4 Student Attendance Report . . . . .	38

4.5	Student Assessment Report . . . . .	38
<b>5</b>	<b>Database design</b>	<b>40</b>
<b>6</b>	<b>Classes</b>	<b>40</b>
6.1	Utility Classes . . . . .	40
6.1.1	RSQL . . . . .	40
6.1.2	Configuration . . . . .	40
6.2	DataBase Models . . . . .	40
<b>7</b>	<b>Conclusion</b>	<b>41</b>
7.1	Final application . . . . .	41
7.2	Future improvements . . . . .	41

## List of Tables

1	Technology Stack . . . . .	2
2	U01: Home Screen . . . . .	2
3	U02: Add Student . . . . .	3
4	U03: View Student . . . . .	4
5	U04: Delete (Update) Student . . . . .	5
6	U05: Add Clo . . . . .	6
7	U06: View Clo . . . . .	7
8	U07: Delete (Update) CLO . . . . .	8
9	U02: Add Rubric . . . . .	9
10	U09: View Rubrics . . . . .	10
11	U10: Delete (Update) Rubric . . . . .	11
12	U11: Add Rubric Level . . . . .	12
13	U12: View Rubrics Levels . . . . .	13
14	U13: Delete (Update) Rubric Level . . . . .	14
15	U14: Add Assessment . . . . .	15
16	U15: View Assessments . . . . .	16
17	U16: Delete (Update) Assessments . . . . .	17
18	U17: Add Assessment Components . . . . .	18
19	U18: View Assessment Components . . . . .	19
20	U19: Delete (Update) Assessment Components . . . . .	20
21	U20: Evaluate Assessment . . . . .	21
22	U21: Add Class Student . . . . .	22
23	U22: View Class Student . . . . .	23
24	U23: Delete (Update) Class Student . . . . .	24
25	U24: Add Student Attendance . . . . .	25
26	U25: View Student Attendance . . . . .	26
27	U26: Delete (Update) Student Attendance . . . . .	27
28	U27: Save Assessment Wise Report . . . . .	28
29	U28: Save CLO Wise Report . . . . .	29
30	U29: Save Attendance Report . . . . .	30
31	U31: Save Assessment of a Student . . . . .	31
32	U32: Save Attendances of a Student . . . . .	32
33	U33: Switch Theme . . . . .	33

## List of Figures

1	U01: Home Screen . . . . .	2
2	U02: Student Adding Screen . . . . .	3
3	U02: Student Adding Dark Theme Screen . . . . .	3
4	U03: Student View Screen . . . . .	4
5	U03: Student View Dark Theme Screen . . . . .	4
6	U04: Student Remove Screen . . . . .	5
7	U04: Student Remove Dark Theme Screen . . . . .	5
8	U05: CLO Adding Screen . . . . .	6
9	U05: CLO Adding Dark Theme Screen . . . . .	6
10	U06: CLO View Screen . . . . .	7
11	U06: CLO View Dark Theme Screen . . . . .	7
12	U07: CLO Update and Delete Screen . . . . .	8
13	U07: CLO Update and Delete Dark Theme Screen . . . . .	8
14	U08: Rubric Adding Screen . . . . .	9
15	U08: Rubric Adding Dark Theme Screen . . . . .	9
16	U09: Rubric View Screen . . . . .	10
17	U09: Rubric View Dark Theme Screen . . . . .	10
18	U10: Rubric Update & Delete Screen . . . . .	11
19	U10: Rubric Update & Delete Dark Theme Screen . . . . .	11
20	U11: Rubric Level Adding Screen . . . . .	12
21	U11: Rubric Level Adding Dark Theme Screen . . . . .	12
22	U12: Rubric Level View Screen . . . . .	13
23	U12: Rubric Level View Dark Theme Screen . . . . .	13
24	U13: Update & Delete Screen . . . . .	14
25	U13: Update & Delete Dark Theme Screen . . . . .	14
26	U14: Assessment Adding Screen . . . . .	15
27	U14: Assessment Adding Dark Theme Screen . . . . .	15
28	U15:View Assessment Screen . . . . .	16
29	U15:View Assessment Dark Theme Screen . . . . .	16
30	U15: Update & Delete Screen of Assessments . . . . .	17
31	U15: Update & Delete Dark Theme Screen of Assessments . . . . .	17
32	U17: Assessment Components Adding Screen . . . . .	18
33	U17: Assessment Components Adding Dark Theme Screen . . . . .	18
34	U18: View Screen of Assessment Components . . . . .	19
35	U18: View Dark Theme Screen of Assessment Components . . . . .	19
36	U19: Update & Delete Screen of Assessment Components . . . . .	20
37	U19: Update & Delete Dark Theme Screen of Assessment Components . . . . .	20
38	U20: Evaluation Screen . . . . .	21
39	U20: Evaluation Dark Theme Screen . . . . .	21
40	U21: Class Student Adding Screen . . . . .	22
41	U21: Class Student Adding Dark Theme Screen . . . . .	22
42	U22: View Screen of Class Attendance . . . . .	23
43	U22: View Dark Theme Screen of Class Attendance . . . . .	23
44	U23: Delete Screen of Class Attendance . . . . .	24
45	U23: Delete Dark Theme Screen of Class Attendance . . . . .	24
46	U24: Attendance Marking Screen . . . . .	25
47	U24: Attendance Marking Dark Theme Screen . . . . .	25
48	U25: View Screen of Student Attendance . . . . .	26
49	U25: View Dark Theme Screen of Student Attendance . . . . .	26
50	U26: Delete Screen of Student Attendance . . . . .	27
51	U26: Delete Dark Theme Screen of Student Attendance . . . . .	27
52	U27: Assessment Report Screen . . . . .	28
53	U27: Assessment Report Dark Theme Screen . . . . .	28
54	U28: CLO Wise Report Screen . . . . .	29

55	U28: CLO Wise Report Dark Theme Screen . . . . .	29
56	U29: Class Attendance Report Screen . . . . .	30
57	U29: Class Attendance Report Dark Theme Screen . . . . .	30
58	U31: Student Assessment Report Screen . . . . .	31
59	U31: Student Assessment Report Dark Theme Screen . . . . .	31
60	U32: Student Attendance Report Screen . . . . .	32
61	U32: Student Attendance Report Dark Theme Screen . . . . .	32
62	U33: Theme Setting Screen . . . . .	33
63	U33: Dark Theme Setting Screen . . . . .	33
64	Assessment report . . . . .	35
65	CLO report . . . . .	36
66	Attendance report . . . . .	37
67	Student Attendance report . . . . .	38
68	Student Assessment report . . . . .	39
69	Database Design . . . . .	40

# 1 Overview

## 1.1 Description

This project focuses on managing assessments and clo of a subject. As we know, as an instructor, it is important to keep track of assessments that provides the information about understanding of each student. A course has certain goals that should be achieved at the end of course duration. These can be referred as course learning outcomes (CLO).

For example, for programming fundamental course it is necessary that at the end of course each students can map real world problem and be able to find an optimal implementation or it can be that proper understanding of programming language that was in course. For each there can be different patterns on which students can be ranked or graded in such a way that each student is evaluated on same parameters. For this purpose we make Rubrics that are efficient way to evaluate an assessment easily. Each rubric has different measurement levels i.e., Excellent, good, average, poor. And the assessment consists of assessment components that are mapped with rubrics. All these management is made easy by providing necessary features in this application.

## 1.2 Business case

This project can be used as course management system in different education sectors by the instructors. As it saves a lot of time that normally course instructor has to spend on evaluating assessments and determining CLO attainment of course. Analytics and stats about CLO attainment of each student provides useful information.

## 1.3 Motivation

As an instructor, he has to map course according to course learning outcomes so that the target can be achieved at the end of course. During the duration of course, he has to take different assesments to evaluate student understanding and concepts related to course. Each assessment is marked on certain parameters usually referred to a Rubric. A rubric has different levels that defines the performance of student in the assessment. All this work is hectic and time taking to manage manually.

So, this project is presented as a solution of this problem that provides all the management at one place with an ease.

## 1.4 Audience

Course instructor or any one who has to evaluate a group of people for a certain training or learning of a skill which has outcomes to be achieved at the end of its duration.

## 1.5 Features

1. User Friendly interface
2. Light & Dark Theme
3. Maintains Students Attendance
4. Record of Student Result
5. Managing Assessments
6. Handle Assessment Components individually
7. Map CLO with various Rubrics
8. Map Rubrics with Rubric Levels
9. Evaluate Assessments
10. Generate PDF Reports

## 1.6 Technology stack

Table 1: Technology Stack

Platform	Desktop
Language	C#
Database	Microsoft SQL Server
Additional Packages	Material Skin 2

## 2 Use cases

## 2.1 Home Screen

Table 2: U01: Home Screen

Use Case ID	U01
Name	Home Screen
Actor	User
Description	It displays the total number of students, assessments and CLOs already added to the system. Below it also mentions some of the features of the application and a welcome message for the user.
UI	



## 2.2 Add Student

Table 3: U02: Add Student

Use Case ID	U02
Name	Add Student
Actor	User
Description	It provides the feature to add the student by providing value of first name, last name, contact, email, registration number and its status (Active or InActive).

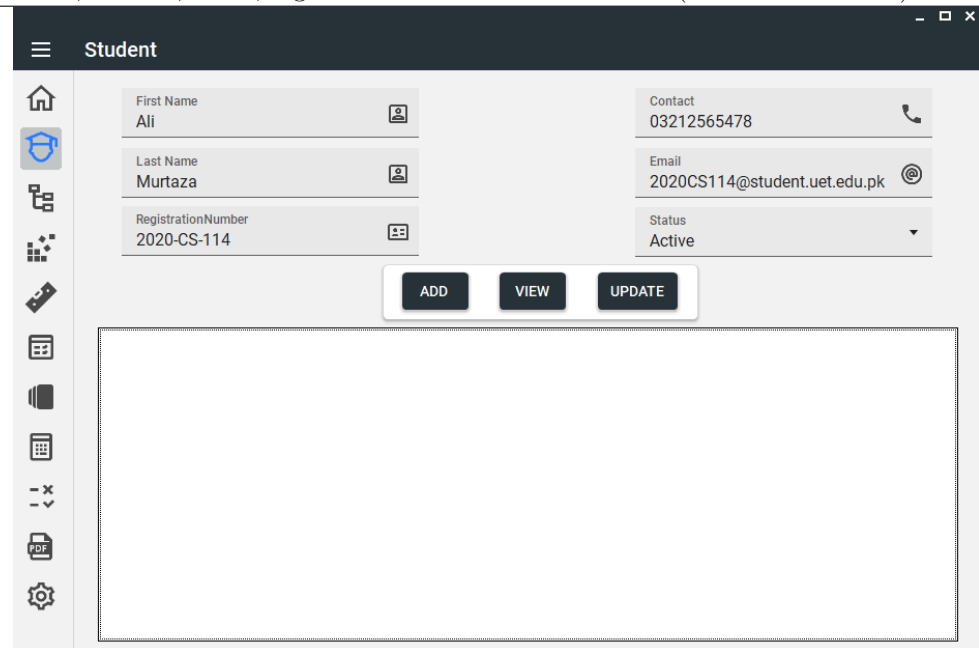


Figure 2: U02: Student Adding Screen

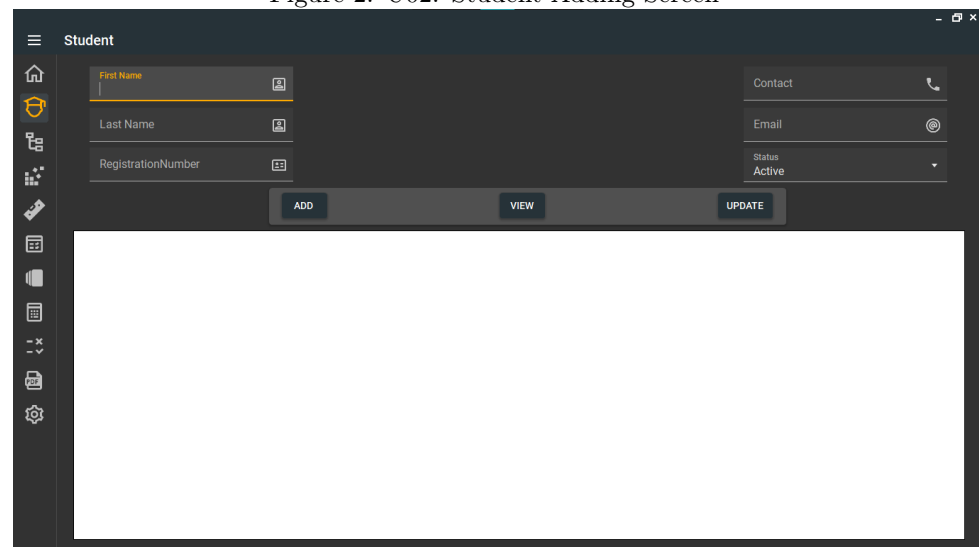


Figure 3: U02: Student Adding Dark Theme Screen

### 2.3 View Student

Table 4: U03: View Student

Use Case ID	U03
Name	View Student
Actor	User
Description	By clicking on the view button details of all students present in the system will be displayed in the datagridview with two buttons columns that provide the feature to update or delete a certain record by simply clicking on it.

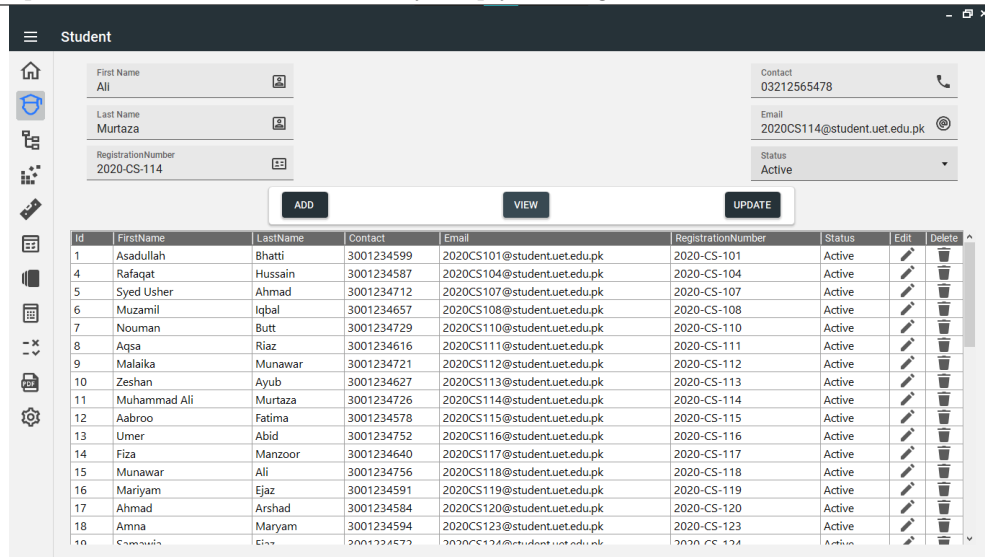


Figure 4: U03: Student View Screen

UI

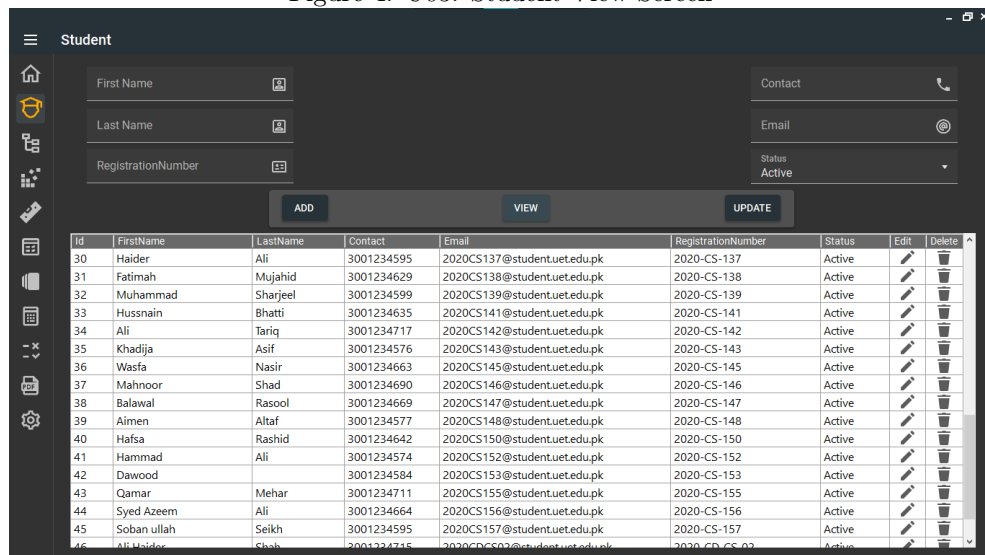
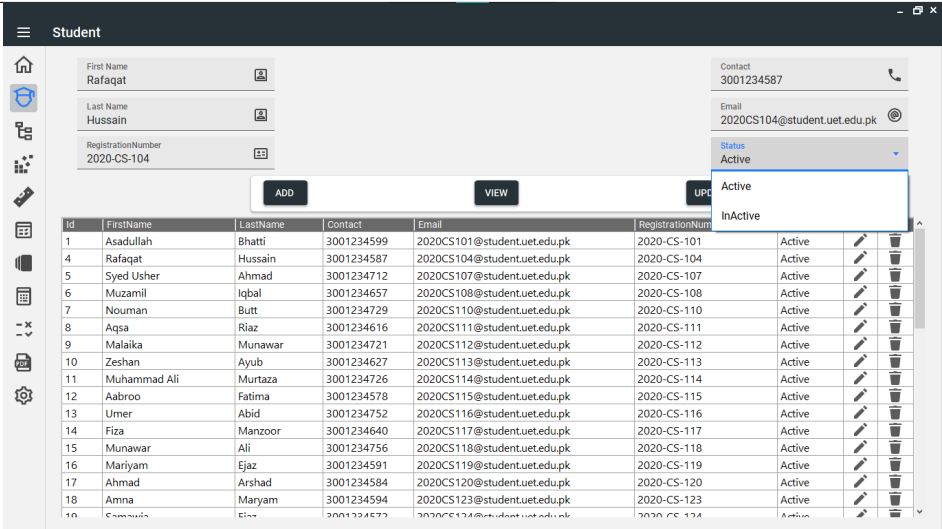
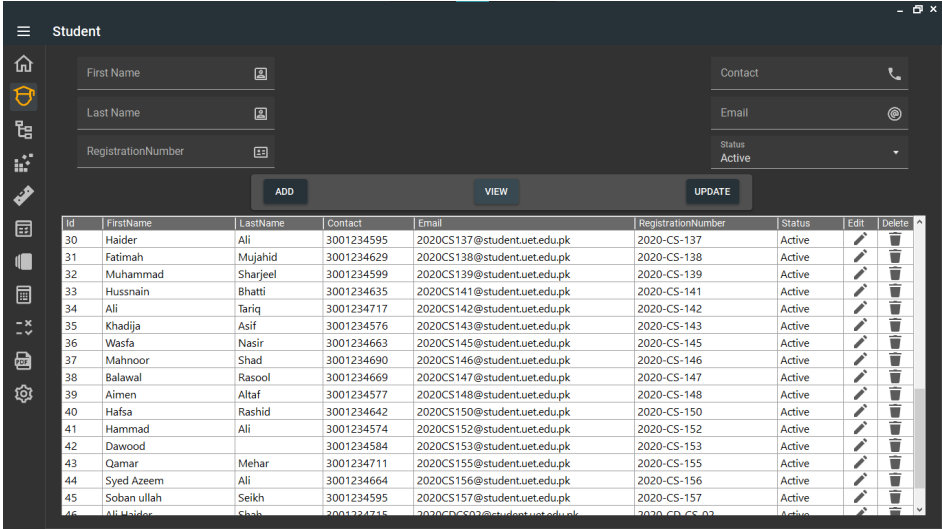


Figure 5: U03: Student View Dark Theme Screen

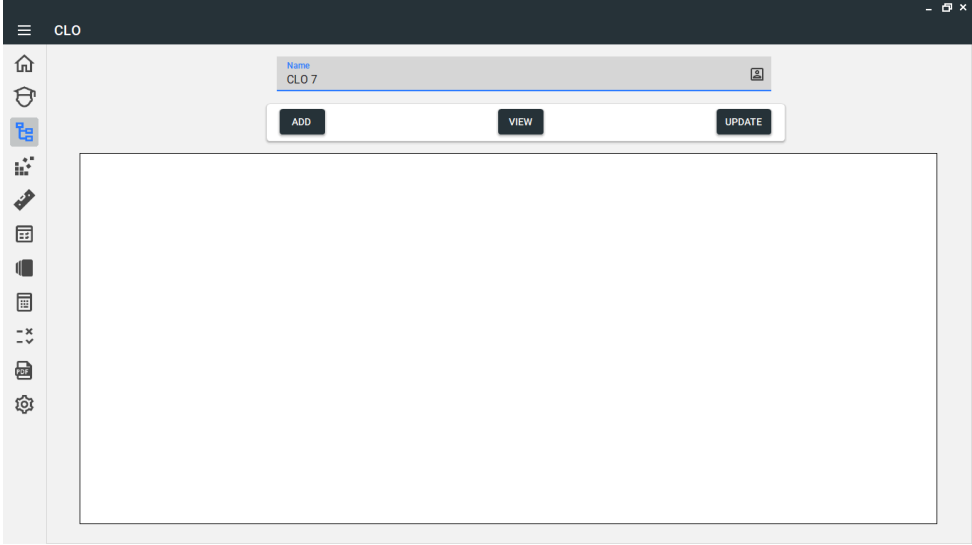
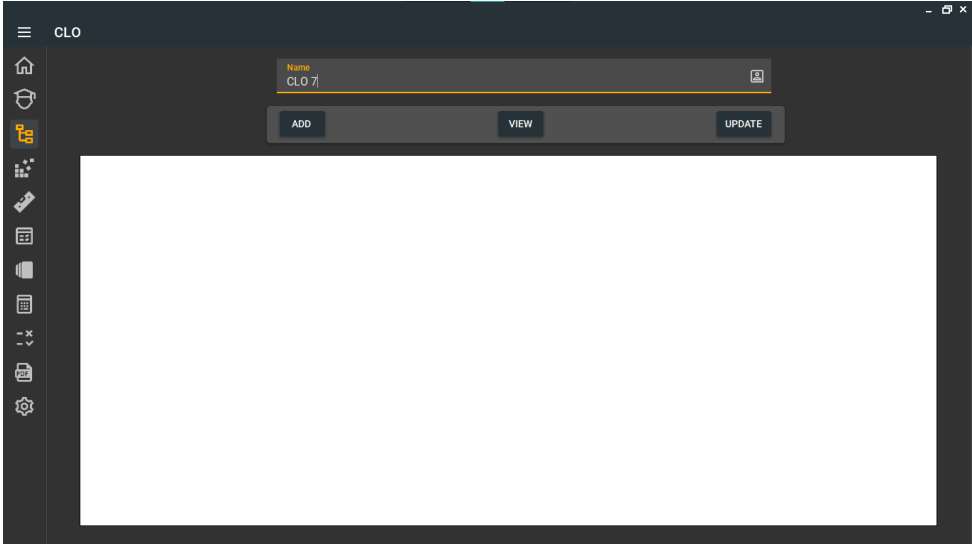
2.4 Delete (Update) Student

Table 5: U04: Delete (Update) Student

Use Case ID	U04
Name	Delete (Update) Student
Actor	User
Description	DatagridView has two columns with action buttons by which user can update or delete a single record
UI	<div><div><p>Figure 6: U04: Student Remove Screen</p></div><div><p>Figure 7: U04: Student Remove Dark Theme Screen</p></div></div>

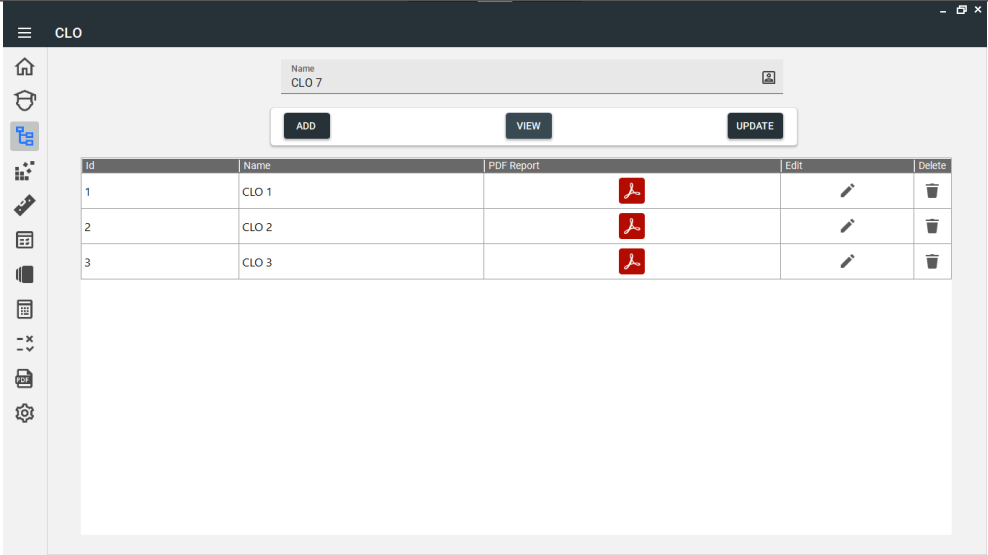
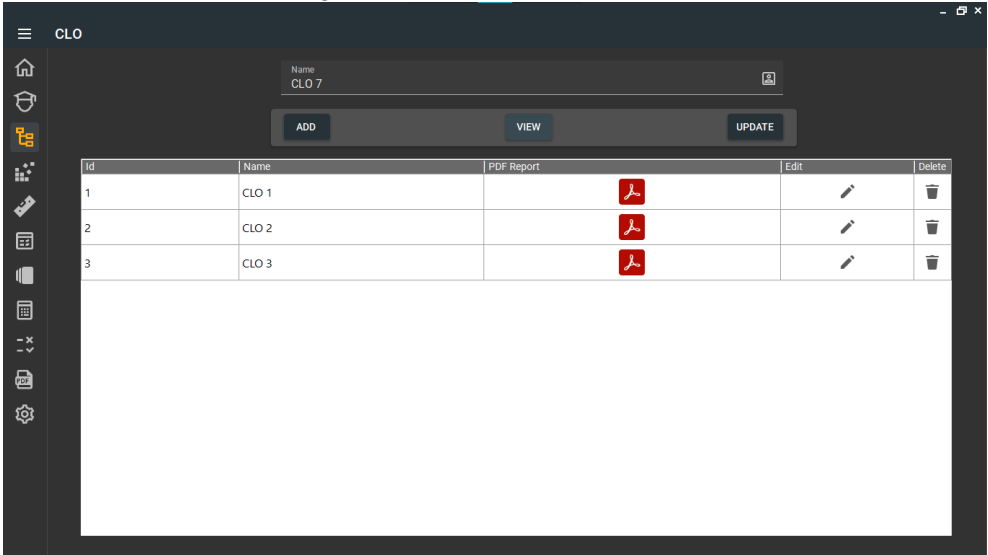
## 2.5 Add Clo

Table 6: U05: Add Clo

Use Case ID	U05
Name	Add Clo
Actor	User
Description	You can add new clo by just providing the name of clo and then pressing the add button.
UI	 <p>Figure 8: U05: CLO Adding Screen</p>  <p>Figure 9: U05: CLO Adding Dark Theme Screen</p>

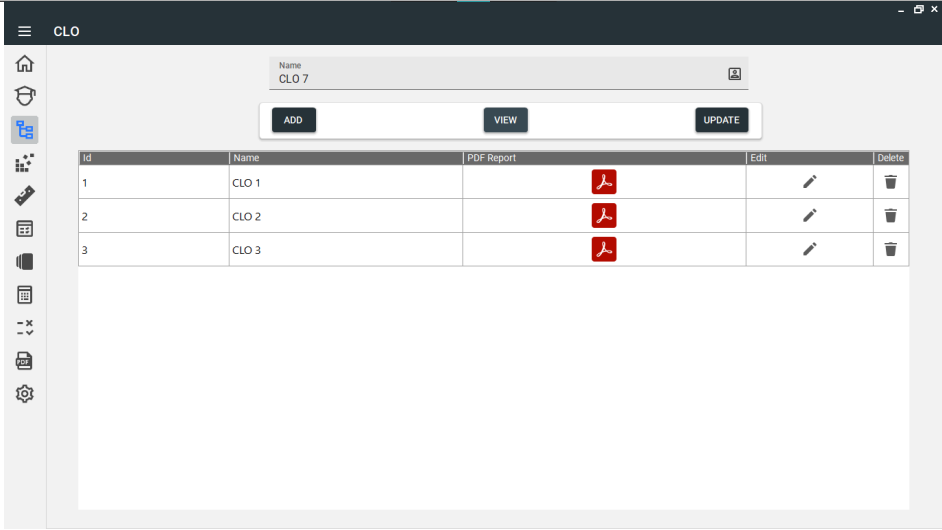
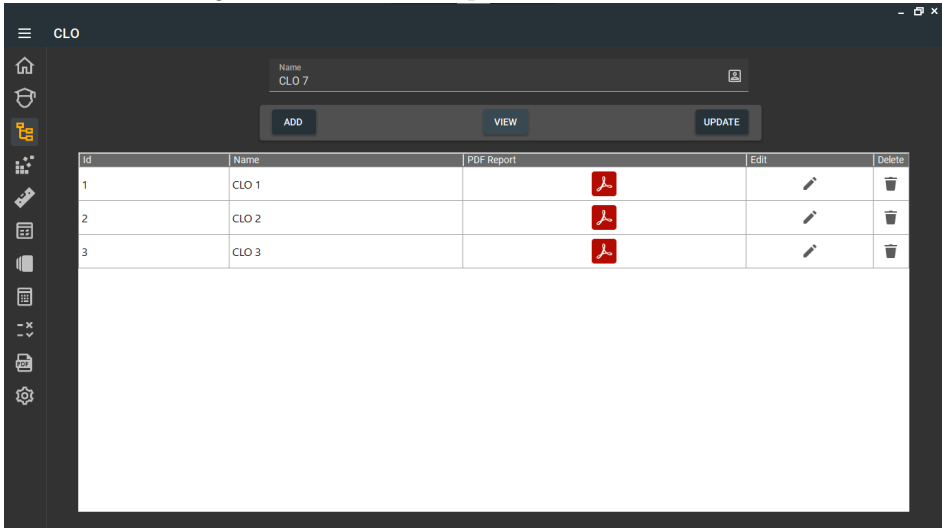
2.6 View Clo

Table 7: U06: View Clo

Use Case ID	U06
Name	View Clo
Actor	User
De-scription	By clicking on the view button details of all CLOs present in the system will be displayed in the datagridview with two buttons columns that provide the feature to update or delete a certain record by simply clicking on it. There is also an action button in its column by clicking on that PDF report will generated.
UI	
	<p>Figure 10: U06: CLO View Screen</p>  <p>Figure 11: U06: CLO View Dark Theme Screen</p>

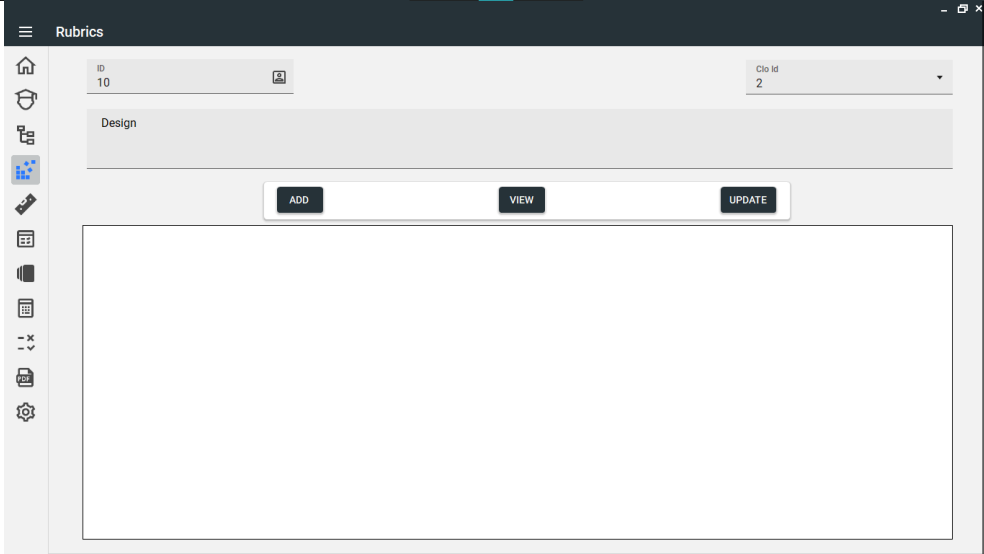
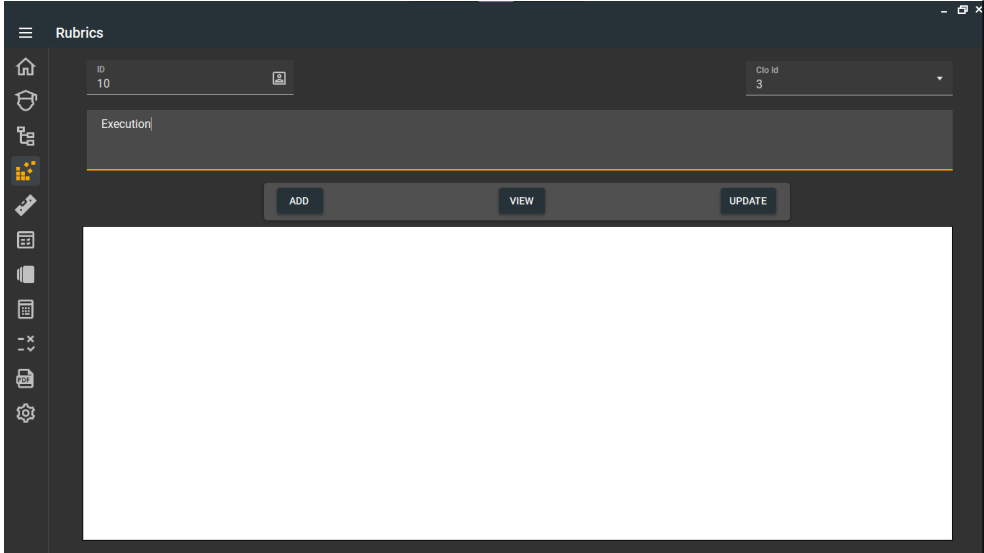
## 2.7 Delete (Update) CLO

Table 8: U07: Delete (Update) CLO

Use Case ID	U07
Name	Delete (Update) CLO
Actor	User
Description	DatagridView has two columns with action buttons by which user can update or delete a single record. If you are deleting a CLO that is mapped with Rubrics then it will be prompt you a warning that you are going to remove all its depending records too.
UI	 <p>Figure 12: U07: CLO Update and Delete Screen</p>  <p>Figure 13: U07: CLO Update and Delete Dark Theme Screen</p>

2.8 Map Rubric with CLO

Table 9: U02: Add Rubric

Use Case ID	U08
Name	Add Rubric
Actor	User
Description	It provides the feature to add the rubric by providing value of rubric id and its details with the CLO id with which it has to be mapped.
UI	<div></div>
	<div><p>Figure 14: U08: Rubric Adding Screen</p></div> <p>Figure 15: U08: Rubric Adding Dark Theme Screen</p>

## 2.9 View All Rubrics

Table 10: U09: View Rubrics

Use Case ID	U09
Name	View Rubrics
Actor	User
Description	By clicking on the view button details of all students present in the system will be displayed in the datagridview with two buttons columns that provide the feature to update or delete a certain record by simply clicking on it.

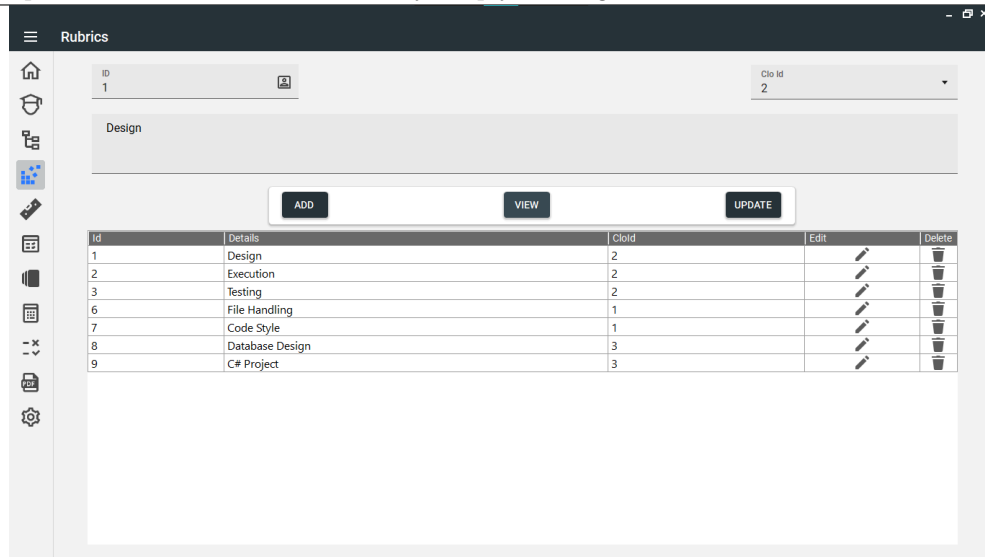


Figure 16: U09: Rubric View Screen

UI

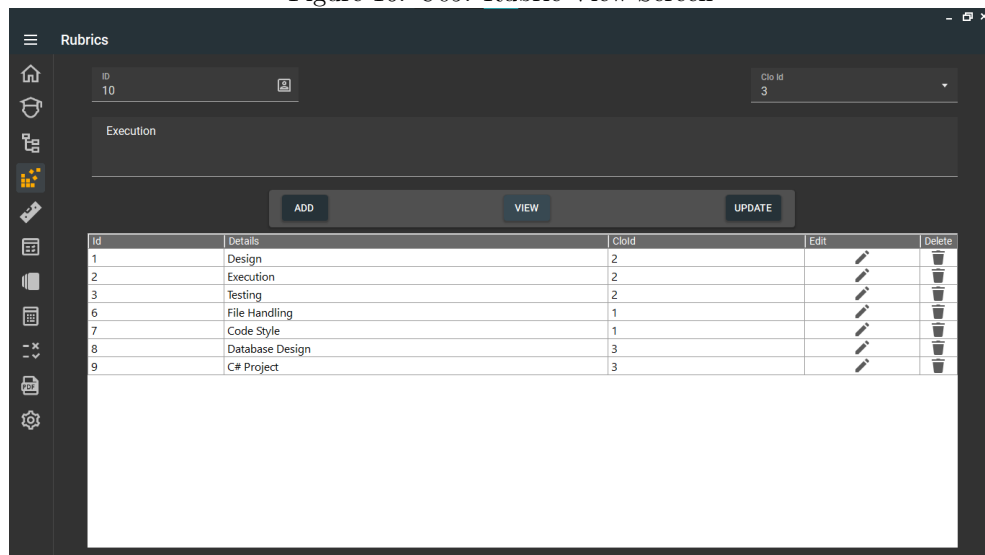
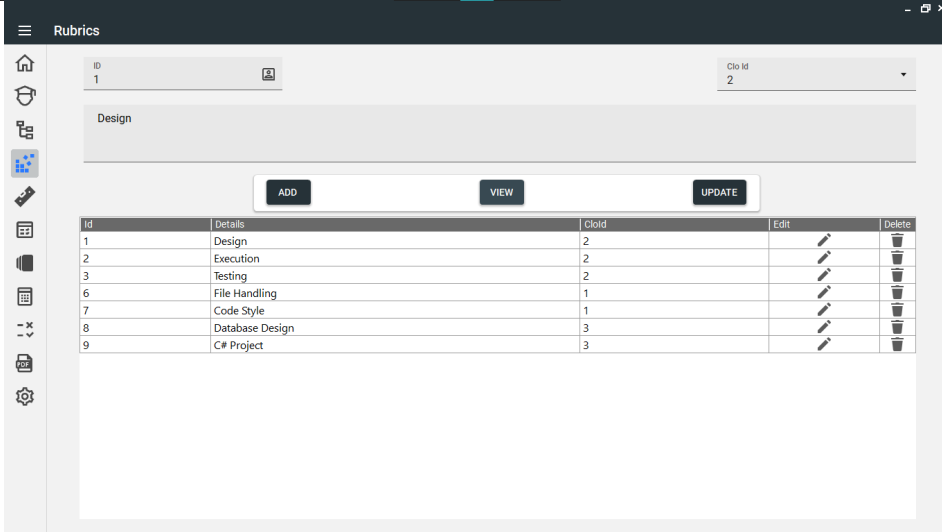
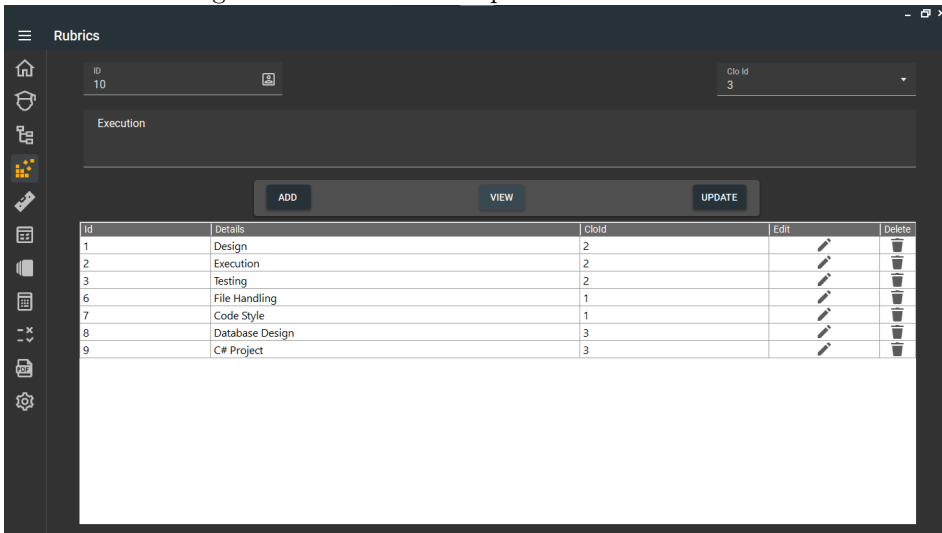


Figure 17: U09: Rubric View Dark Theme Screen



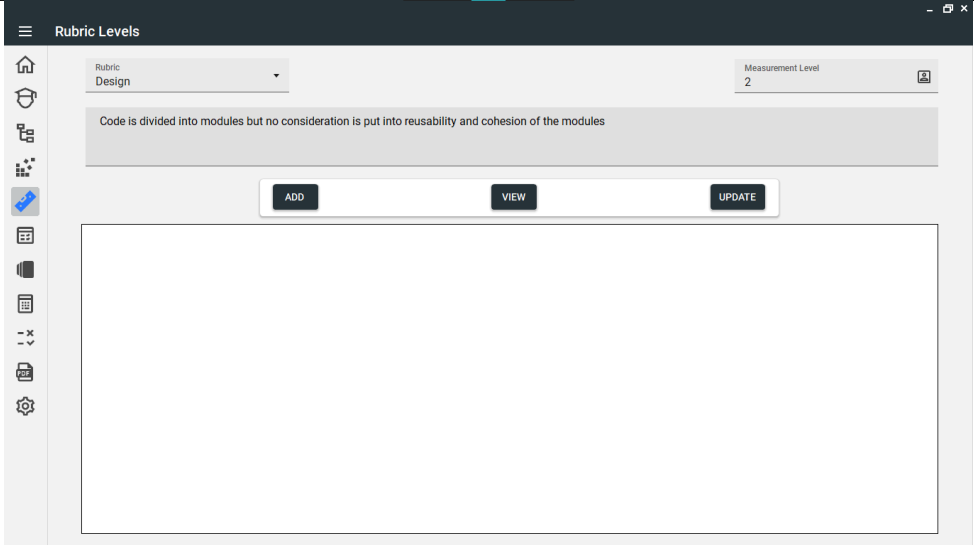
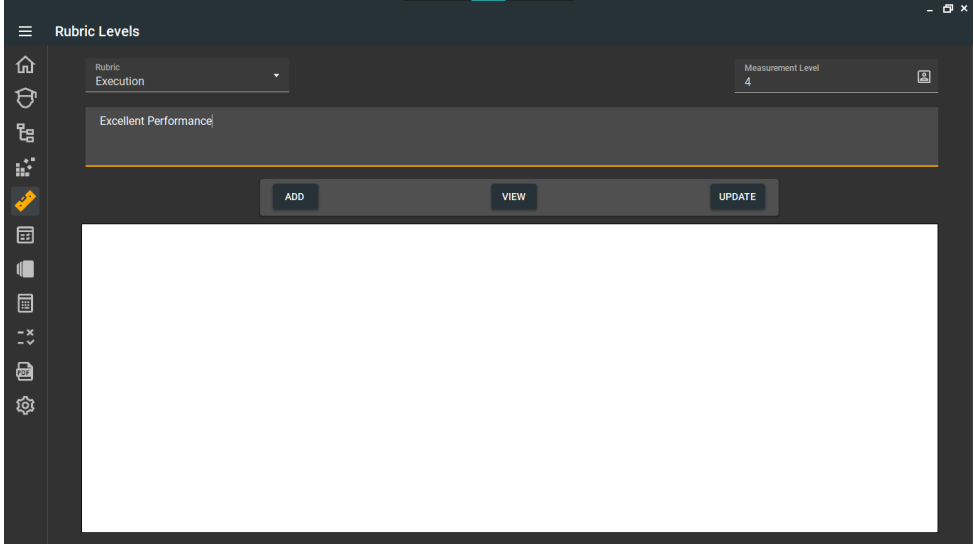
## 2.10 Delete (Update) Rubric

Table 11: U10: Delete (Update) Rubric

Use Case ID	U10
Name	Delete (Update) Rubric
Actor	User
Description	DatagridView has two columns with action buttons by which user can update or delete a single record. But if you try to remove Rubric that is mapped with rubric level it will prompt a message that you are sure to remove this record.
UI	 <p>Figure 18: U10: Rubric Update &amp; Delete Screen</p>  <p>Figure 19: U10: Rubric Update &amp; Delete Dark Theme Screen</p>

2.11 Map Rubric Levels with Rubrics

Table 12: U11: Add Rubric Level

Use Case ID	U11
Name	Add Rubric Level
Actor	User
Description	It provides the feature to add the rubric level by providing value of rubric id, measurement level and details of it.
UI	<div><div><p>Figure 20: U11: Rubric Level Adding Screen</p></div><div><p>Figure 21: U11: Rubric Level Adding Dark Theme Screen</p></div></div>

## 2.12 View All Rubrics Levels

Table 13: U12: View Rubrics Levels

Use Case ID	U12
Name	View Rubrics Level
Actor	User
Description	By clicking on the view button details of all students present in the system will be displayed in the datagridview with two buttons columns that provide the feature to update or delete a certain record by simply clicking on it.

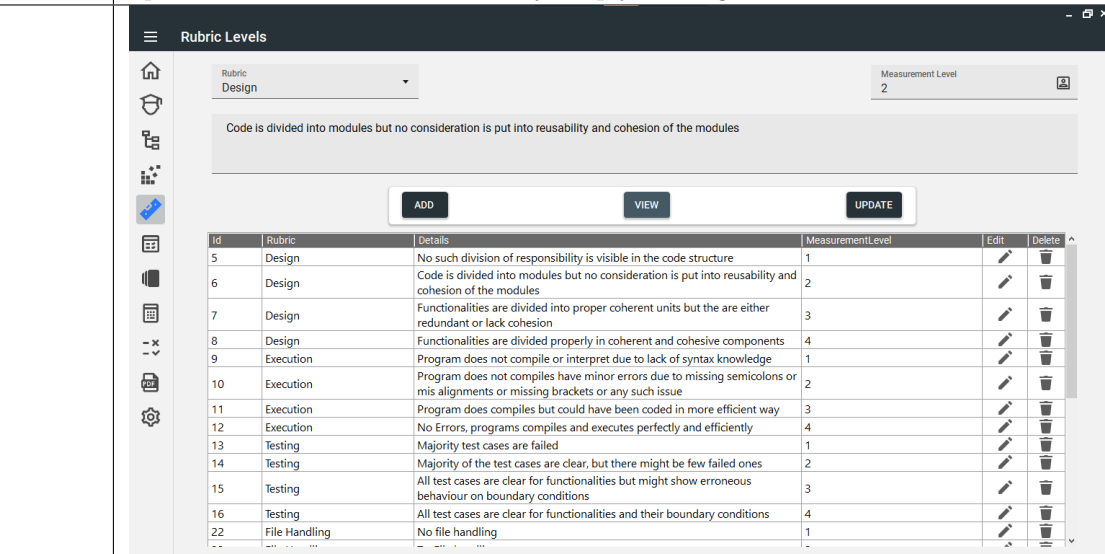


Figure 22: U12: Rubric Level View Screen

UI

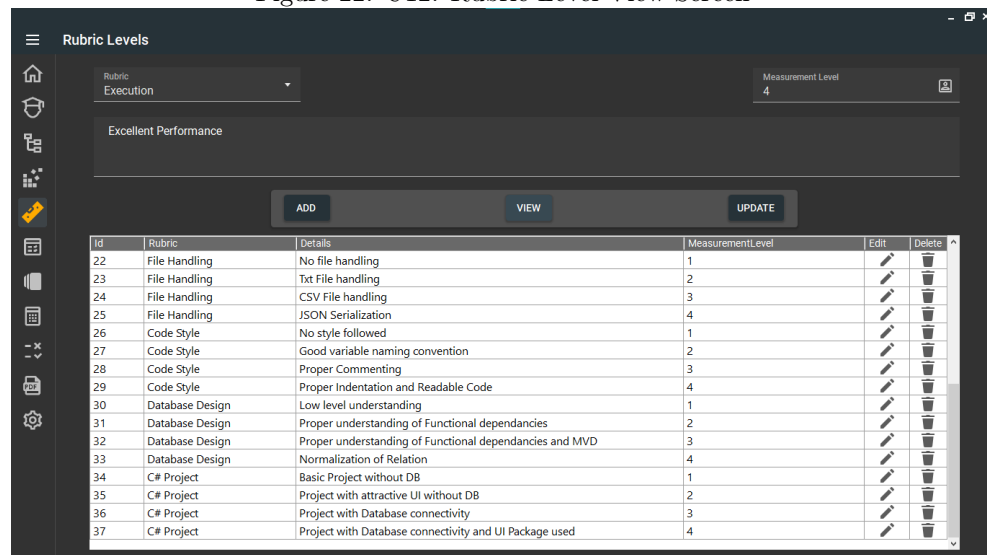


Figure 23: U12: Rubric Level View Dark Theme Screen

## 2.13 Delete (Update) Rubric Level

Table 14: U13: Delete (Update) Rubric Level

Use Case ID	U13
Name	Delete (Update) Rubric Level
Actor	User
Description	DatagridView has two columns with action buttons by which user can update or delete a single record. But if you try to remove Rubric Level that is mapped with Assessments it will prompt a message that you are sure to remove this record.

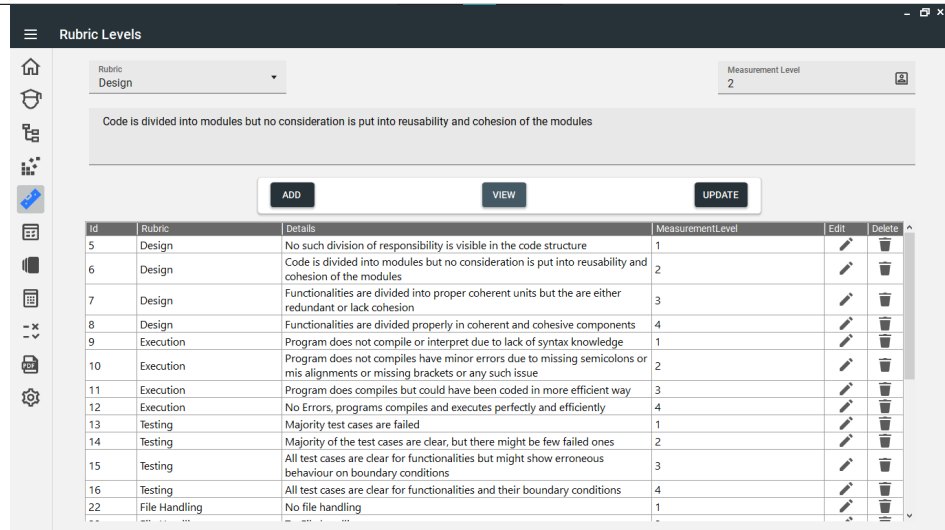


Figure 24: U13: Update & Delete Screen

UI

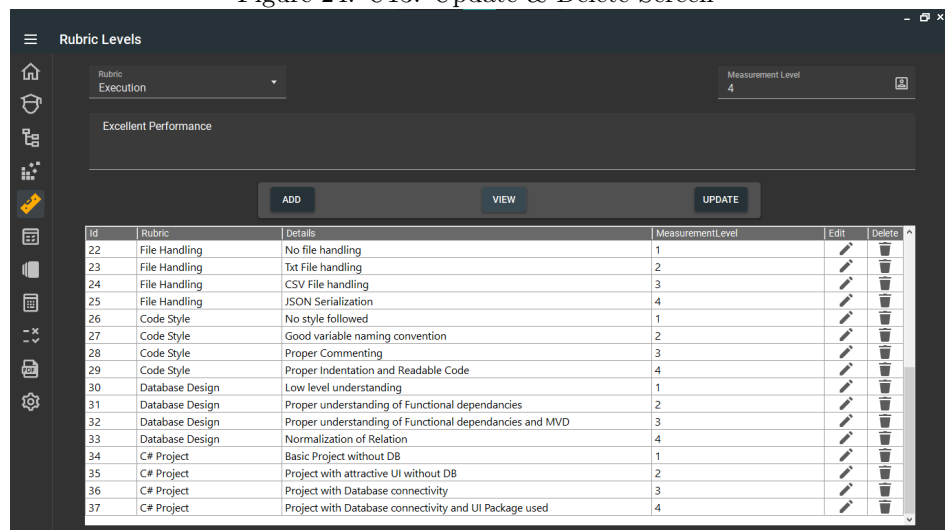


Figure 25: U13: Update & Delete Dark Theme Screen

## 2.14 Create Assessments

Table 15: U14: Add Assessment

Use Case ID	U14
Name	Add Assessments
Actor	User
Description	It provides the feature to add the rubric level by providing value of title, total marks and total weightage.

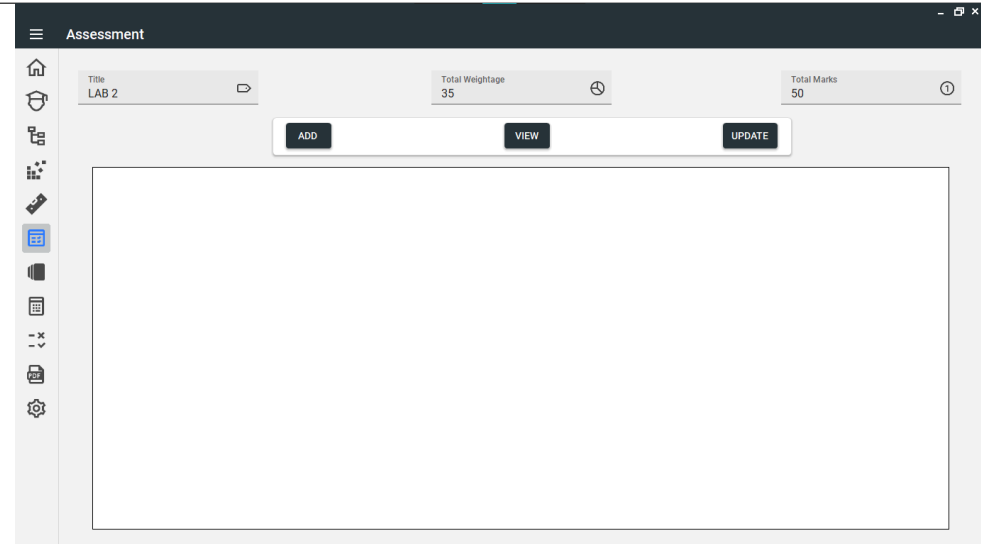


Figure 26: U14: Assessment Adding Screen

UI

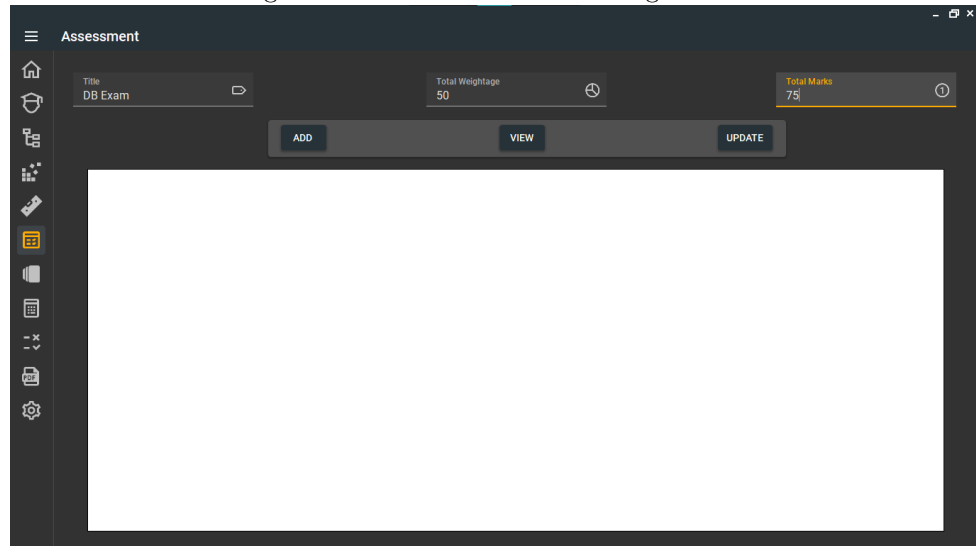
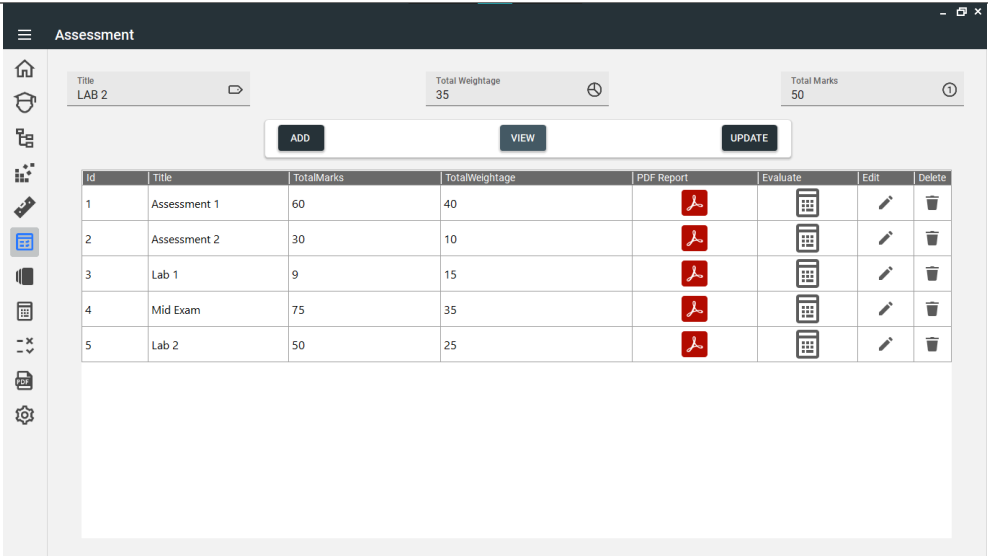
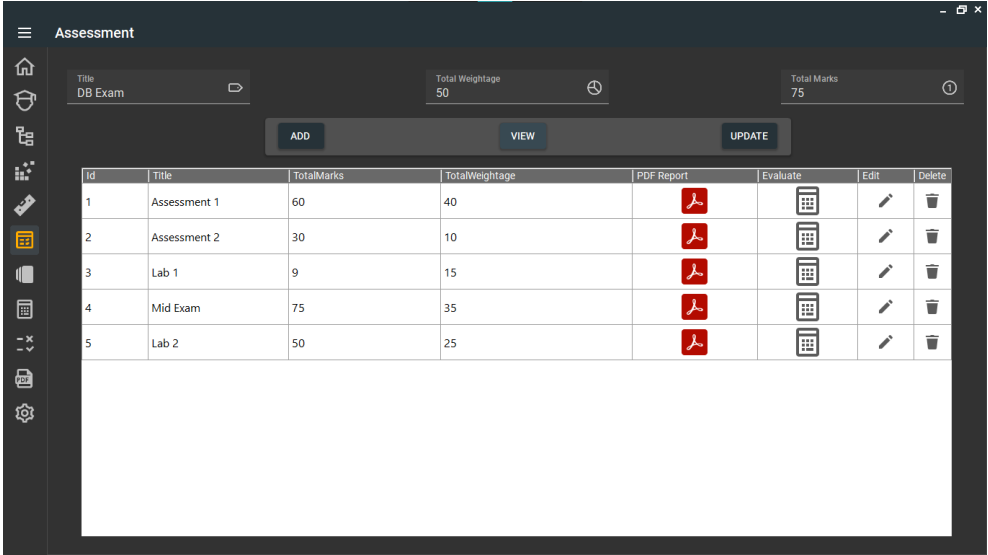


Figure 27: U14: Assessment Adding Dark Theme Screen

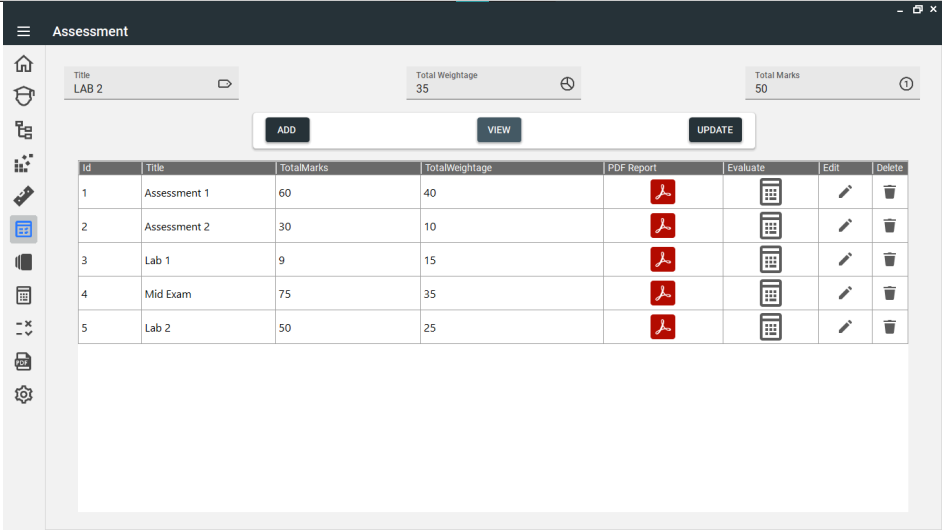
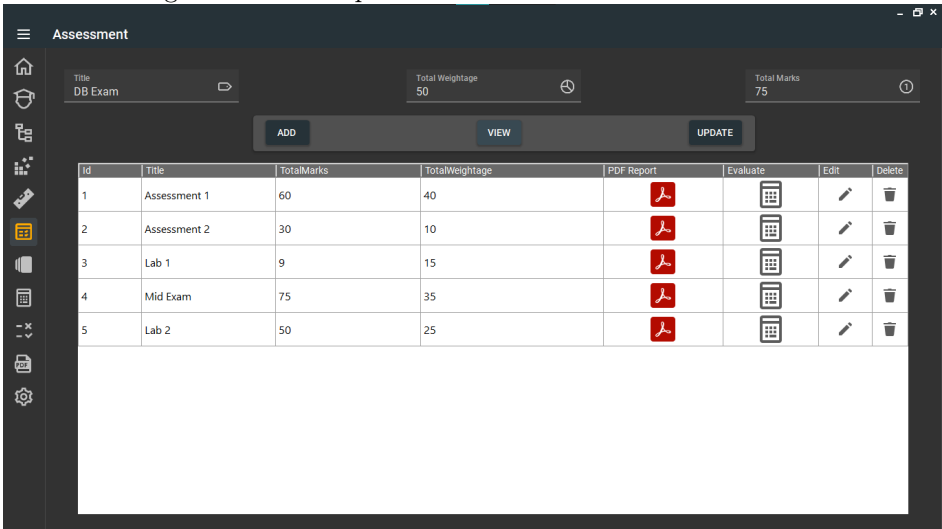
2.15 View All Assessments

Table 16: U15: View Assessments

Use Case ID	U15
Name	View Assessments
Actor	User
De-scription	By clicking on the view button details of all students present in the system will be displayed in the datagridview with two buttons columns that provide the feature to update or delete a certain record by simply clicking on it.
UI	
	<p>Figure 28: U15:View Assessment Screen</p>  <p>Figure 29: U15:View Assessment Dark Theme Screen</p>

2.16 Delete (Update) Assessment

Table 17: U16: Delete (Update) Assessments

Use Case ID	U16
Name	Delete (Update) Assessments
Actor	User
Description	DatagridView has two columns with action buttons by which user can update or delete a single record. But if you try to remove a record that is mapped with Student result it will prompt a message that you are sure to remove this record.
UI	<div><div><p>Figure 30: U15: Update &amp; Delete Screen of Assessments</p></div><div><p>Figure 31: U15: Update &amp; Delete Dark Theme Screen of Assessments</p></div></div>

## 2.17 Add Assessment Components

Table 18: U17: Add Assessment Components

Use Case ID	U17
Name	Add Assessment Components
Actor	User
Description	It provides the feature to add the rubric level by providing value of name, rubric id, total marks and assessment id.

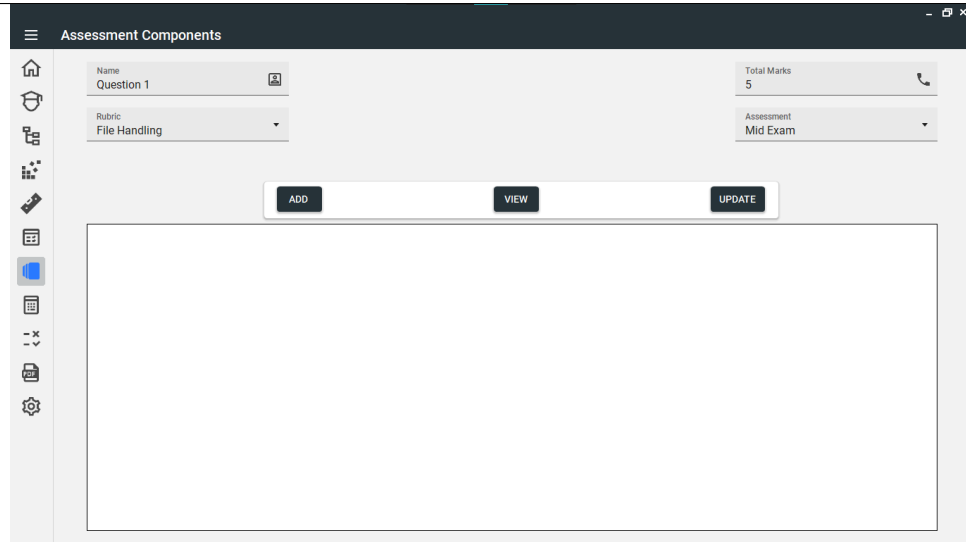


Figure 32: U17: Assessment Components Adding Screen

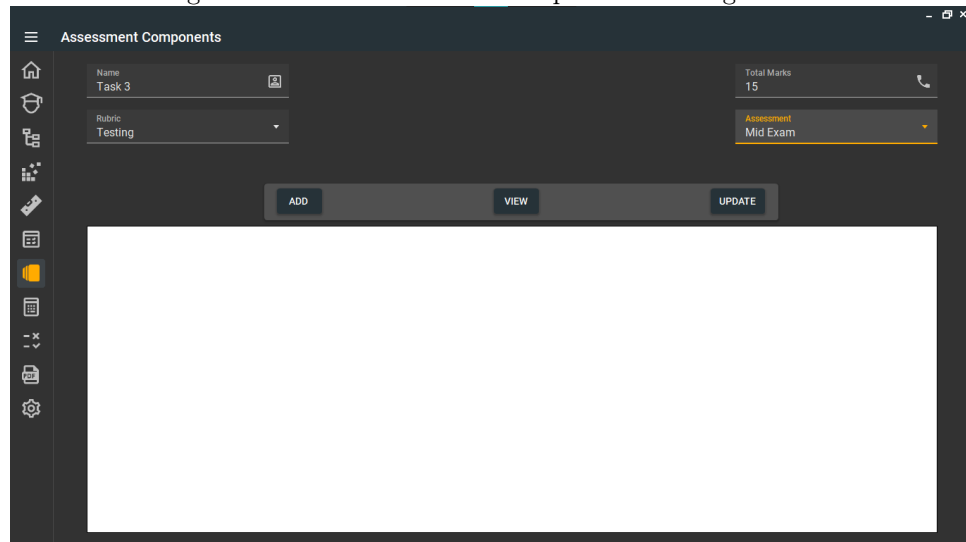
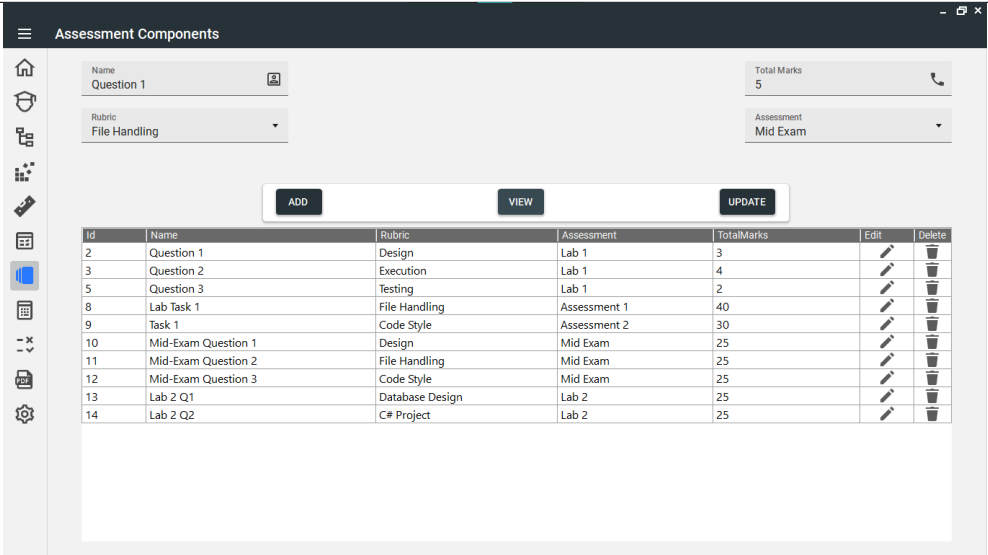
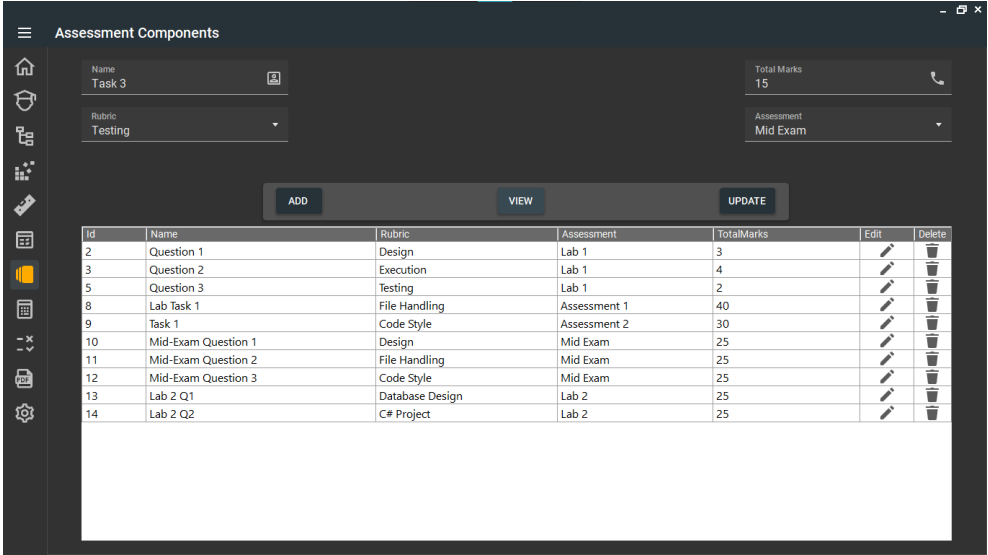


Figure 33: U17: Assessment Components Adding Dark Theme Screen



2.18 View All Assessment Components

Table 19: U18: View Assessment Components

Use Case ID	U18
Name	View Assessment Components
Actor	User
De-scription	By clicking on the view button details of all students present in the system will be displayed in the datagridview with two buttons columns that provide the feature to update or delete a certain record by simply clicking on it.
UI	<div><p>Figure 34: U18: View Screen of Assessment Components</p><p>Figure 35: U18: View Dark Theme Screen of Assessment Components</p></div>

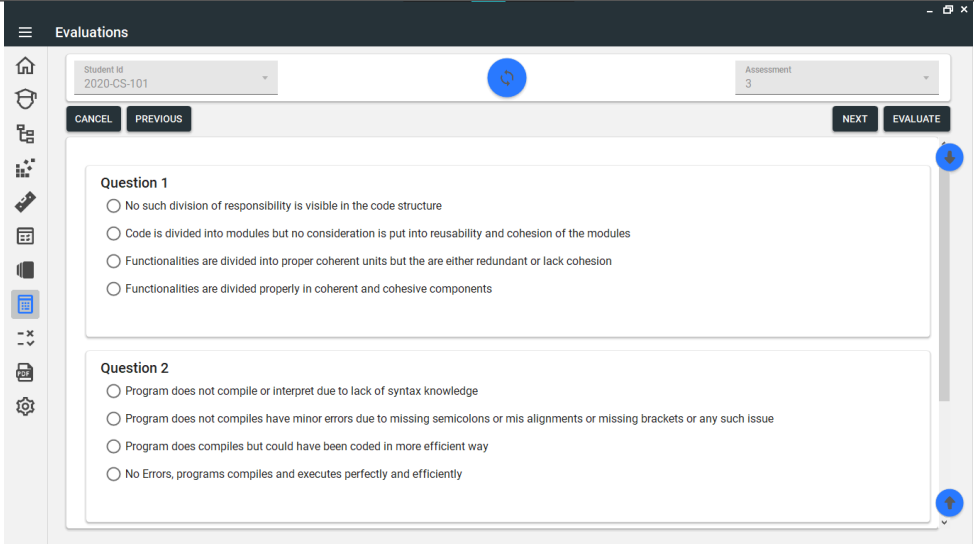
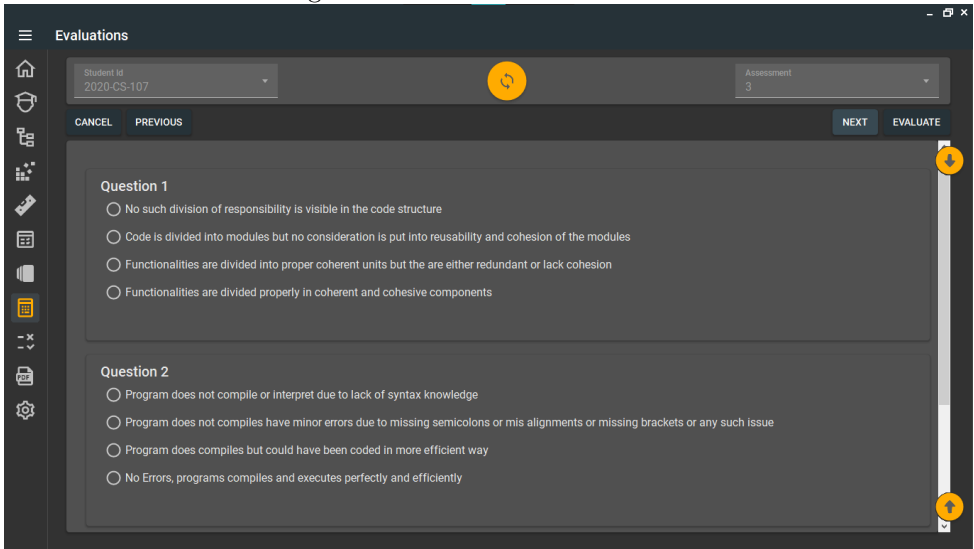
2.19 Delete (Update) Assessment Components

Table 20: U19: Delete (Update) Assessment Components

Use Case ID	U19
Name	Delete (Update) Assessment Components
Actor	User
Description	DatagridView has two columns with action buttons by which user can update or delete a single record. But if you try to remove a record that is mapped with Student result it will prompt a message that you are sure to remove this record.
UI	
	<p>Figure 36: U19: Update &amp; Delete Screen of Assessment Components</p>
	<p>Figure 37: U19: Update &amp; Delete Dark Theme Screen of Assessment Components</p>

2.20 Evaluate Assessment

Table 21: U20: Evaluate Assessment

Use Case ID	U20
Name	Evaluate Assessment
Actor	User
Description	<p>The evaluation screen provides a combo box to select desired student and another one for assessment. Evaluation when you click on load button that will display content on the screen with three more buttons Evaluate, Cancel, Next and Previous buttons with scroll up and downs buttons also. Using navigation button you can select any student and evaluate it.</p>
UI	<div><div></div><div><p>Figure 38: U20: Evaluation Screen</p></div><div><p>Figure 39: U20: Evaluation Dark Theme Screen</p></div></div>

## 2.21 Add Class Student

Table 22: U21: Add Class Student

Use Case ID	U21
Name	Add Class Student
Actor	User
Description	It provides the feature to add new class attendance by just selecting the date and clicking on new attendance button.

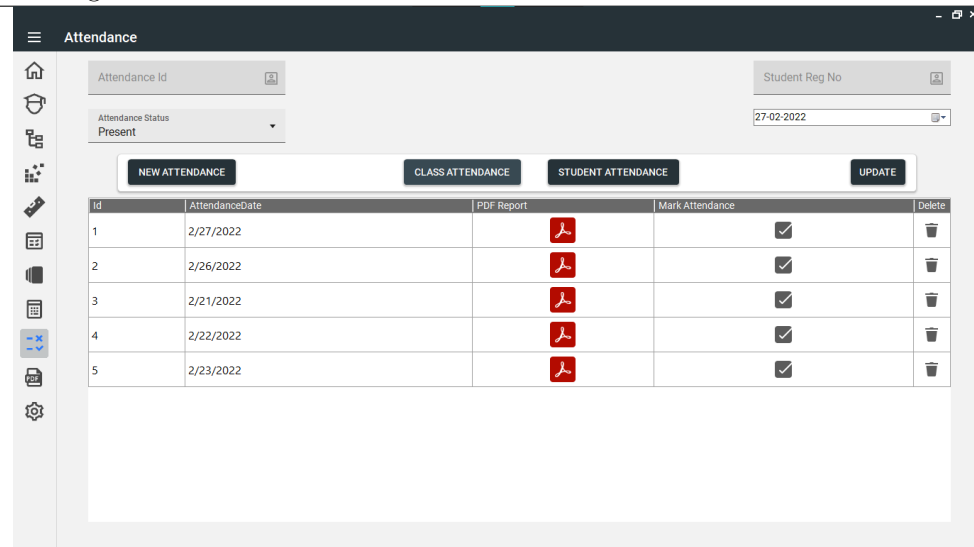


Figure 40: U21: Class Student Adding Screen

UI

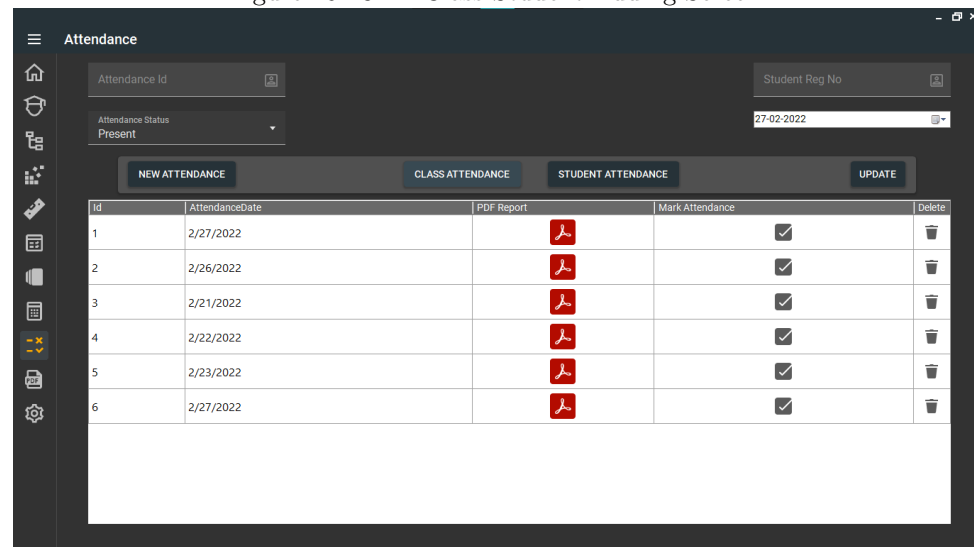


Figure 41: U21: Class Student Adding Dark Theme Screen

## 2.22 View All Class Student

Table 23: U22: View Class Student

Use Case ID	U22
Name	View Class Student
Actor	User
Description	By clicking on the view button details of all students present in the system will be displayed in the datagridview with two buttons columns that provide the feature to update or delete a certain record by simply clicking on it. You can mark attend by clicking on the mark button in datagridview.

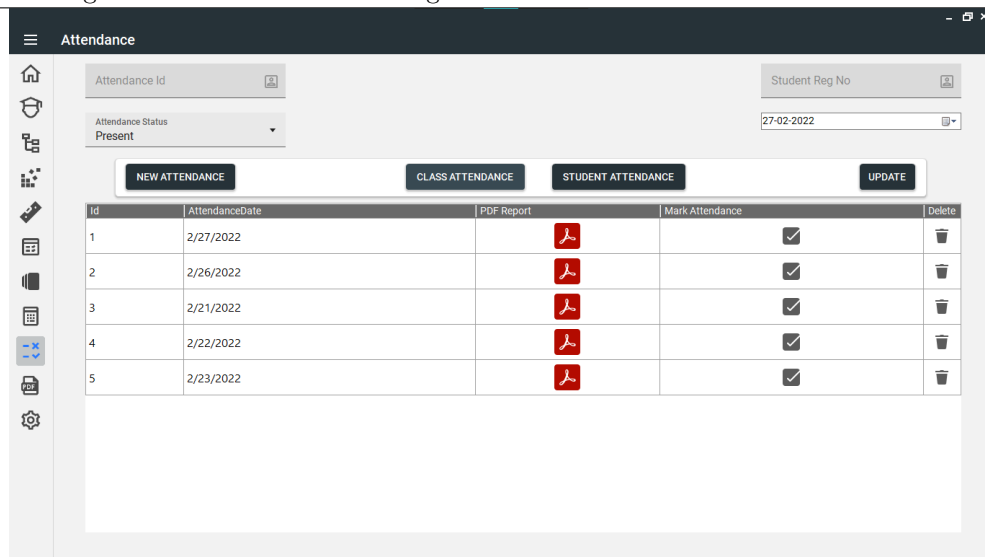


Figure 42: U22: View Screen of Class Attendance

UI

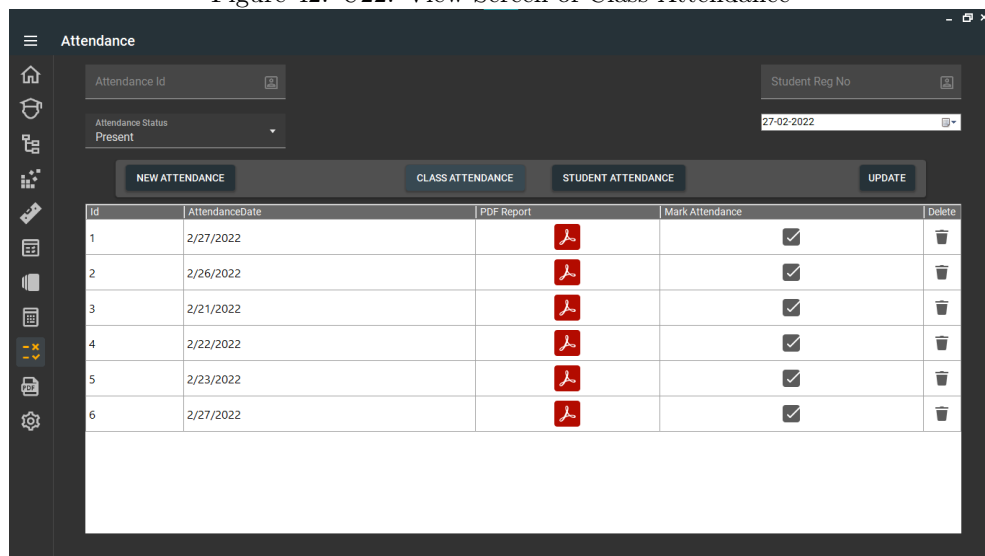


Figure 43: U22: View Dark Theme Screen of Class Attendance

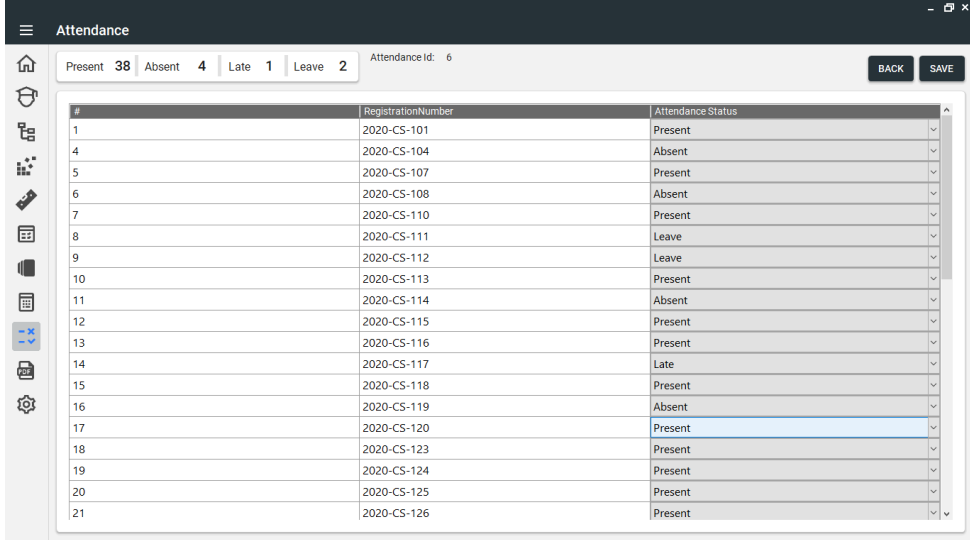
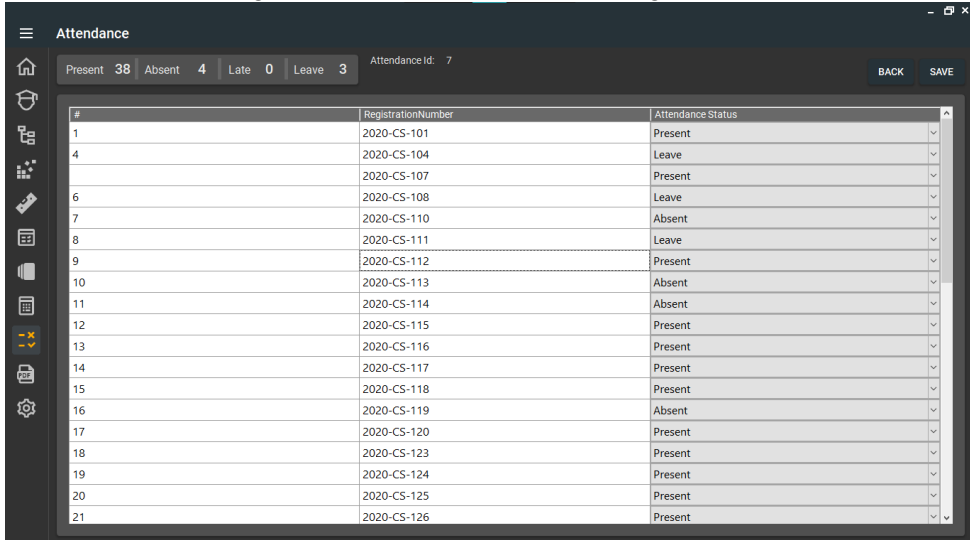
2.23 Delete (Update) Class Student

Table 24: U23: Delete (Update) Class Student

Use Case ID	U23																																																																	
Name	Delete Class Student																																																																	
Actor	User																																																																	
Description	DatagridView has two columns with action buttons by which user can update or delete a single record.																																																																	
UI	<div><div><div><div><div>Attendance</div><div><div>Attendance Id</div><div>Student Reg No</div><div>Attendance Status Present</div><div>27-02-2022</div><div>NEW ATTENDANCE</div><div>CLASS ATTENDANCE</div><div>STUDENT ATTENDANCE</div><div>UPDATE</div><table><tr><th>Id</th><th>AttendanceDate</th><th>PDF Report</th><th>Mark Attendance</th><th>Delete</th></tr><tr><td>1</td><td>2/27/2022</td><td></td><td><input checked="" type="checkbox"/></td><td></td></tr><tr><td>2</td><td>2/26/2022</td><td></td><td><input checked="" type="checkbox"/></td><td></td></tr><tr><td>3</td><td>2/21/2022</td><td></td><td><input checked="" type="checkbox"/></td><td></td></tr><tr><td>4</td><td>2/22/2022</td><td></td><td><input checked="" type="checkbox"/></td><td></td></tr><tr><td>5</td><td>2/23/2022</td><td></td><td><input checked="" type="checkbox"/></td><td></td></tr></table></div></div></div></div><div><div>Figure 44: U23: Delete Screen of Class Attendance</div><div><div><div>Attendance</div><div><div>Attendance Id</div><div>Student Reg No</div><div>Attendance Status Present</div><div>27-02-2022</div><div>NEW ATTENDANCE</div><div>CLASS ATTENDANCE</div><div>STUDENT ATTENDANCE</div><div>UPDATE</div><table><tr><th>Id</th><th>AttendanceDate</th><th>PDF Report</th><th>Mark Attendance</th><th>Delete</th></tr><tr><td>1</td><td>2/27/2022</td><td></td><td><input checked="" type="checkbox"/></td><td></td></tr><tr><td>2</td><td>2/26/2022</td><td></td><td><input checked="" type="checkbox"/></td><td></td></tr><tr><td>3</td><td>2/21/2022</td><td></td><td><input checked="" type="checkbox"/></td><td></td></tr><tr><td>4</td><td>2/22/2022</td><td></td><td><input checked="" type="checkbox"/></td><td></td></tr><tr><td>5</td><td>2/23/2022</td><td></td><td><input checked="" type="checkbox"/></td><td></td></tr><tr><td>6</td><td>2/27/2022</td><td></td><td><input checked="" type="checkbox"/></td><td></td></tr></table></div></div></div></div><div><div>Figure 45: U23: Delete Dark Theme Screen of Class Attendance</div></div></div>	Id	AttendanceDate	PDF Report	Mark Attendance	Delete	1	2/27/2022		<input checked="" type="checkbox"/>		2	2/26/2022		<input checked="" type="checkbox"/>		3	2/21/2022		<input checked="" type="checkbox"/>		4	2/22/2022		<input checked="" type="checkbox"/>		5	2/23/2022		<input checked="" type="checkbox"/>		Id	AttendanceDate	PDF Report	Mark Attendance	Delete	1	2/27/2022		<input checked="" type="checkbox"/>		2	2/26/2022		<input checked="" type="checkbox"/>		3	2/21/2022		<input checked="" type="checkbox"/>		4	2/22/2022		<input checked="" type="checkbox"/>		5	2/23/2022		<input checked="" type="checkbox"/>		6	2/27/2022		<input checked="" type="checkbox"/>	
Id	AttendanceDate	PDF Report	Mark Attendance	Delete																																																														
1	2/27/2022		<input checked="" type="checkbox"/>																																																															
2	2/26/2022		<input checked="" type="checkbox"/>																																																															
3	2/21/2022		<input checked="" type="checkbox"/>																																																															
4	2/22/2022		<input checked="" type="checkbox"/>																																																															
5	2/23/2022		<input checked="" type="checkbox"/>																																																															
Id	AttendanceDate	PDF Report	Mark Attendance	Delete																																																														
1	2/27/2022		<input checked="" type="checkbox"/>																																																															
2	2/26/2022		<input checked="" type="checkbox"/>																																																															
3	2/21/2022		<input checked="" type="checkbox"/>																																																															
4	2/22/2022		<input checked="" type="checkbox"/>																																																															
5	2/23/2022		<input checked="" type="checkbox"/>																																																															
6	2/27/2022		<input checked="" type="checkbox"/>																																																															

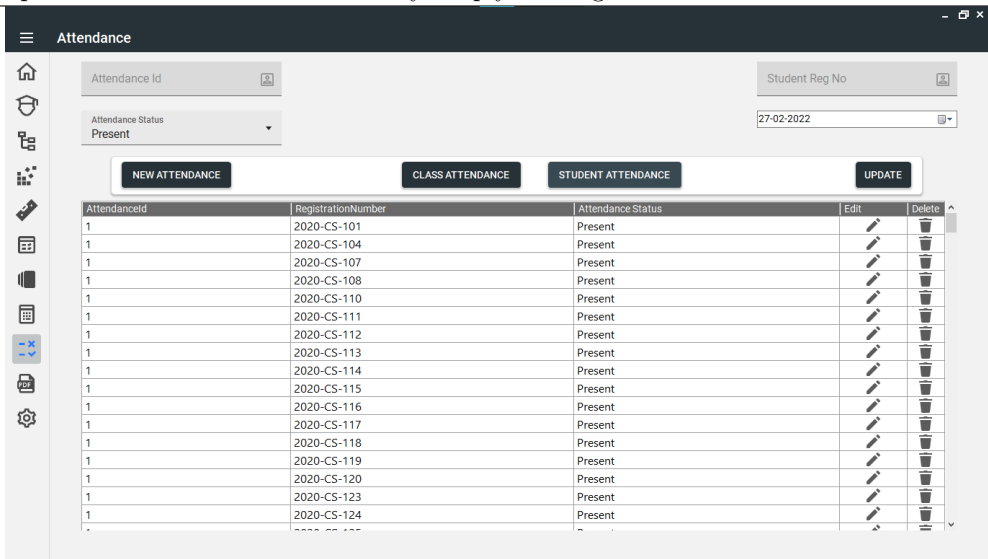
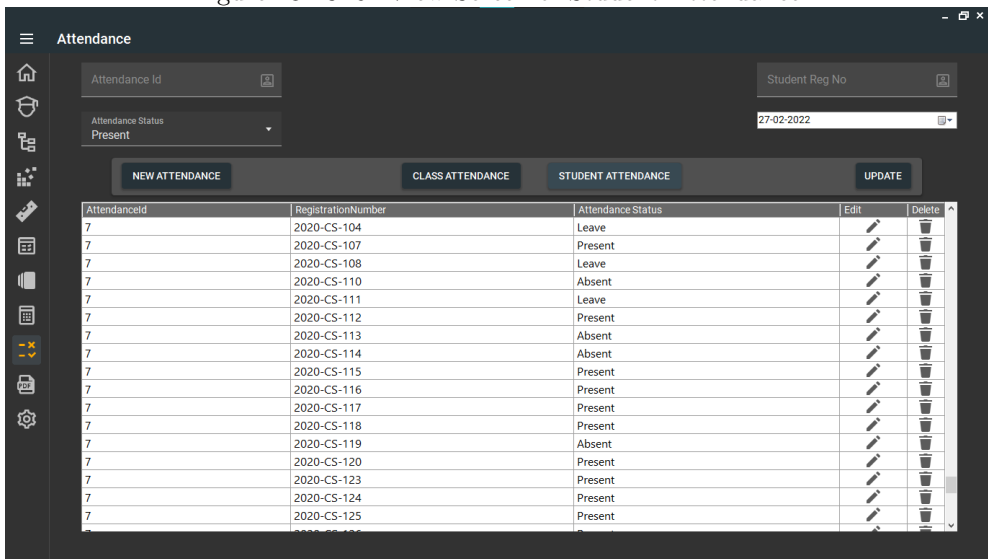
2.24 Mark Student Attendance

Table 25: U24: Add Student Attendance

Use Case ID	U24																																																																																																																								
Name	Add Student Attendance																																																																																																																								
Actor	User																																																																																																																								
Description	By clicking on the mark button provided in the class attendance grid view that opens a screen with all students initially present. You can change their status, there is also a status counter that displays the live number of present students and same for others. When you are done press the save button and then back button to exit that screen.																																																																																																																								
UI	<div><div><table><tr><th>#</th><th>RegistrationNumber</th><th>Attendance Status</th></tr><tr><td>1</td><td>2020-CS-101</td><td>Present</td></tr><tr><td>4</td><td>2020-CS-104</td><td>Absent</td></tr><tr><td>5</td><td>2020-CS-107</td><td>Present</td></tr><tr><td>6</td><td>2020-CS-108</td><td>Absent</td></tr><tr><td>7</td><td>2020-CS-110</td><td>Present</td></tr><tr><td>8</td><td>2020-CS-111</td><td>Leave</td></tr><tr><td>9</td><td>2020-CS-112</td><td>Leave</td></tr><tr><td>10</td><td>2020-CS-113</td><td>Present</td></tr><tr><td>11</td><td>2020-CS-114</td><td>Absent</td></tr><tr><td>12</td><td>2020-CS-115</td><td>Present</td></tr><tr><td>13</td><td>2020-CS-116</td><td>Present</td></tr><tr><td>14</td><td>2020-CS-117</td><td>Late</td></tr><tr><td>15</td><td>2020-CS-118</td><td>Present</td></tr><tr><td>16</td><td>2020-CS-119</td><td>Absent</td></tr><tr><td>17</td><td>2020-CS-120</td><td>Present</td></tr><tr><td>18</td><td>2020-CS-123</td><td>Present</td></tr><tr><td>19</td><td>2020-CS-124</td><td>Present</td></tr><tr><td>20</td><td>2020-CS-125</td><td>Present</td></tr><tr><td>21</td><td>2020-CS-126</td><td>Present</td></tr></table></div><div><p>Figure 46: U24: Attendance Marking Screen</p><table><tr><th>#</th><th>RegistrationNumber</th><th>Attendance Status</th></tr><tr><td>1</td><td>2020-CS-101</td><td>Present</td></tr><tr><td>4</td><td>2020-CS-104</td><td>Leave</td></tr><tr><td></td><td>2020-CS-107</td><td>Present</td></tr><tr><td>6</td><td>2020-CS-108</td><td>Leave</td></tr><tr><td>7</td><td>2020-CS-110</td><td>Absent</td></tr><tr><td>8</td><td>2020-CS-111</td><td>Leave</td></tr><tr><td>9</td><td>2020-CS-112</td><td>Present</td></tr><tr><td>10</td><td>2020-CS-113</td><td>Absent</td></tr><tr><td>11</td><td>2020-CS-114</td><td>Absent</td></tr><tr><td>12</td><td>2020-CS-115</td><td>Present</td></tr><tr><td>13</td><td>2020-CS-116</td><td>Present</td></tr><tr><td>14</td><td>2020-CS-117</td><td>Present</td></tr><tr><td>15</td><td>2020-CS-118</td><td>Present</td></tr><tr><td>16</td><td>2020-CS-119</td><td>Absent</td></tr><tr><td>17</td><td>2020-CS-120</td><td>Present</td></tr><tr><td>18</td><td>2020-CS-123</td><td>Present</td></tr><tr><td>19</td><td>2020-CS-124</td><td>Present</td></tr><tr><td>20</td><td>2020-CS-125</td><td>Present</td></tr><tr><td>21</td><td>2020-CS-126</td><td>Present</td></tr></table></div><div><p>Figure 47: U24: Attendance Marking Dark Theme Screen</p></div></div>	#	RegistrationNumber	Attendance Status	1	2020-CS-101	Present	4	2020-CS-104	Absent	5	2020-CS-107	Present	6	2020-CS-108	Absent	7	2020-CS-110	Present	8	2020-CS-111	Leave	9	2020-CS-112	Leave	10	2020-CS-113	Present	11	2020-CS-114	Absent	12	2020-CS-115	Present	13	2020-CS-116	Present	14	2020-CS-117	Late	15	2020-CS-118	Present	16	2020-CS-119	Absent	17	2020-CS-120	Present	18	2020-CS-123	Present	19	2020-CS-124	Present	20	2020-CS-125	Present	21	2020-CS-126	Present	#	RegistrationNumber	Attendance Status	1	2020-CS-101	Present	4	2020-CS-104	Leave		2020-CS-107	Present	6	2020-CS-108	Leave	7	2020-CS-110	Absent	8	2020-CS-111	Leave	9	2020-CS-112	Present	10	2020-CS-113	Absent	11	2020-CS-114	Absent	12	2020-CS-115	Present	13	2020-CS-116	Present	14	2020-CS-117	Present	15	2020-CS-118	Present	16	2020-CS-119	Absent	17	2020-CS-120	Present	18	2020-CS-123	Present	19	2020-CS-124	Present	20	2020-CS-125	Present	21	2020-CS-126	Present
#	RegistrationNumber	Attendance Status																																																																																																																							
1	2020-CS-101	Present																																																																																																																							
4	2020-CS-104	Absent																																																																																																																							
5	2020-CS-107	Present																																																																																																																							
6	2020-CS-108	Absent																																																																																																																							
7	2020-CS-110	Present																																																																																																																							
8	2020-CS-111	Leave																																																																																																																							
9	2020-CS-112	Leave																																																																																																																							
10	2020-CS-113	Present																																																																																																																							
11	2020-CS-114	Absent																																																																																																																							
12	2020-CS-115	Present																																																																																																																							
13	2020-CS-116	Present																																																																																																																							
14	2020-CS-117	Late																																																																																																																							
15	2020-CS-118	Present																																																																																																																							
16	2020-CS-119	Absent																																																																																																																							
17	2020-CS-120	Present																																																																																																																							
18	2020-CS-123	Present																																																																																																																							
19	2020-CS-124	Present																																																																																																																							
20	2020-CS-125	Present																																																																																																																							
21	2020-CS-126	Present																																																																																																																							
#	RegistrationNumber	Attendance Status																																																																																																																							
1	2020-CS-101	Present																																																																																																																							
4	2020-CS-104	Leave																																																																																																																							
	2020-CS-107	Present																																																																																																																							
6	2020-CS-108	Leave																																																																																																																							
7	2020-CS-110	Absent																																																																																																																							
8	2020-CS-111	Leave																																																																																																																							
9	2020-CS-112	Present																																																																																																																							
10	2020-CS-113	Absent																																																																																																																							
11	2020-CS-114	Absent																																																																																																																							
12	2020-CS-115	Present																																																																																																																							
13	2020-CS-116	Present																																																																																																																							
14	2020-CS-117	Present																																																																																																																							
15	2020-CS-118	Present																																																																																																																							
16	2020-CS-119	Absent																																																																																																																							
17	2020-CS-120	Present																																																																																																																							
18	2020-CS-123	Present																																																																																																																							
19	2020-CS-124	Present																																																																																																																							
20	2020-CS-125	Present																																																																																																																							
21	2020-CS-126	Present																																																																																																																							

## 2.25 View All Student Attendance

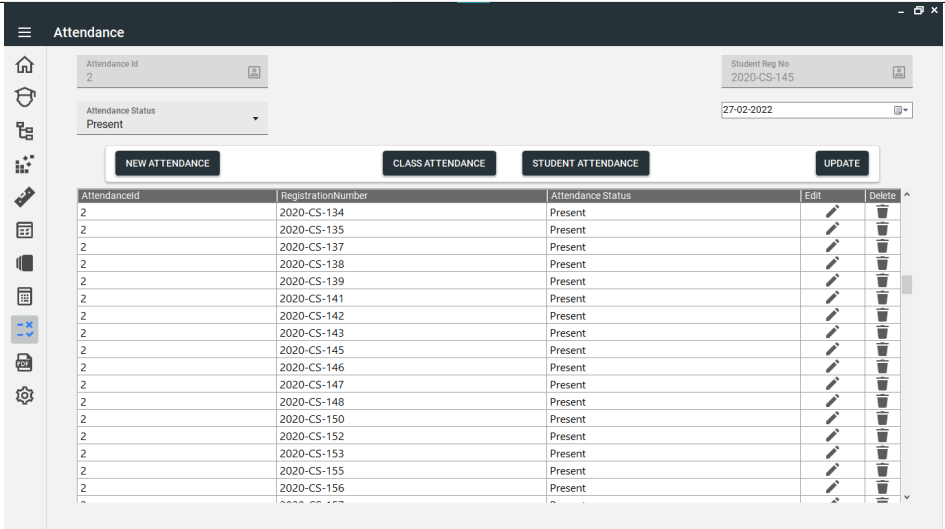
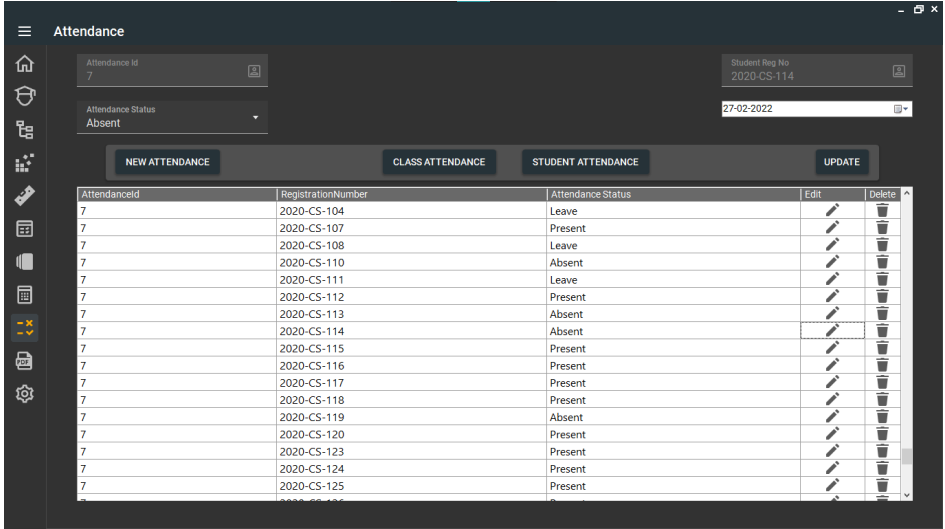
Table 26: U25: View Student Attendance

Use Case ID	U25
Name	View Student Attendance
Actor	User
Description	By clicking on the view button details of all students present in the system will be displayed in the datagridview with two buttons columns that provide the feature to update or delete a certain record by simply clicking on it.
UI	 <p>Figure 48: U25: View Screen of Student Attendance</p>  <p>Figure 49: U25: View Dark Theme Screen of Student Attendance</p>



## 2.26 Delete (Update) Student Attendance

Table 27: U26: Delete (Update) Student Attendance

Use Case ID	U26
Name	Delete Student Attendance
Actor	User
Description	DatagridView has two columns with action buttons by which user can update or delete a single record.
UI	 <p>Figure 50: U26: Delete Screen of Student Attendance</p>  <p>Figure 51: U26: Delete Dark Theme Screen of Student Attendance</p>

2.27 Assessment Wise Report

Table 28: U27: Save Assessment Wise Report

Use Case ID	U27
Name	Save Assessment Wise Report
Actor	User
Description	Assessment screen has the pdf button in its data grid view adjacent to each assessment. You can generate pdf report of required assessment by pressing the button against to it.

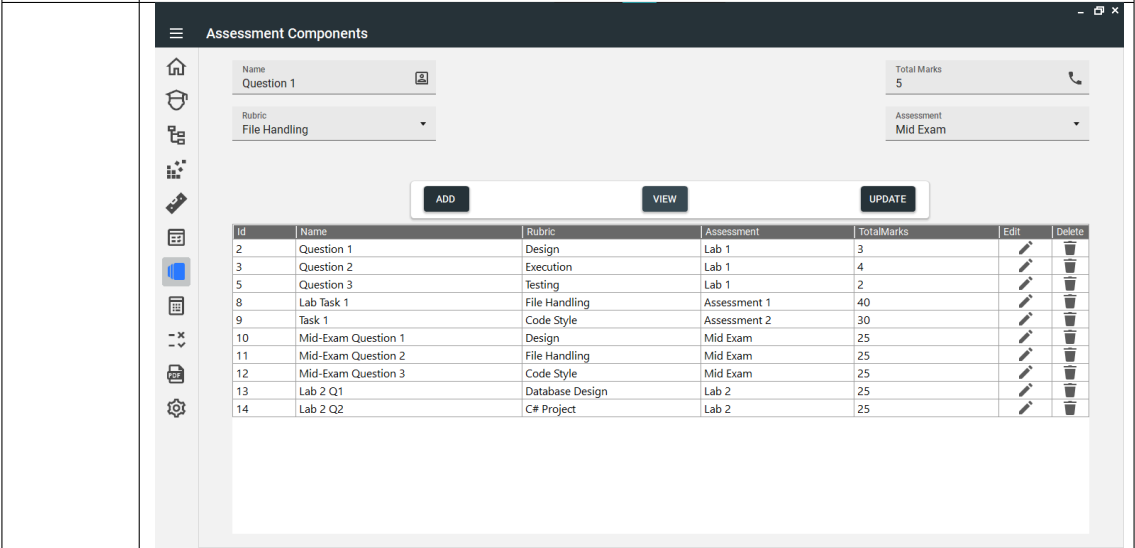


Figure 52: U27: Assessment Report Screen

UI

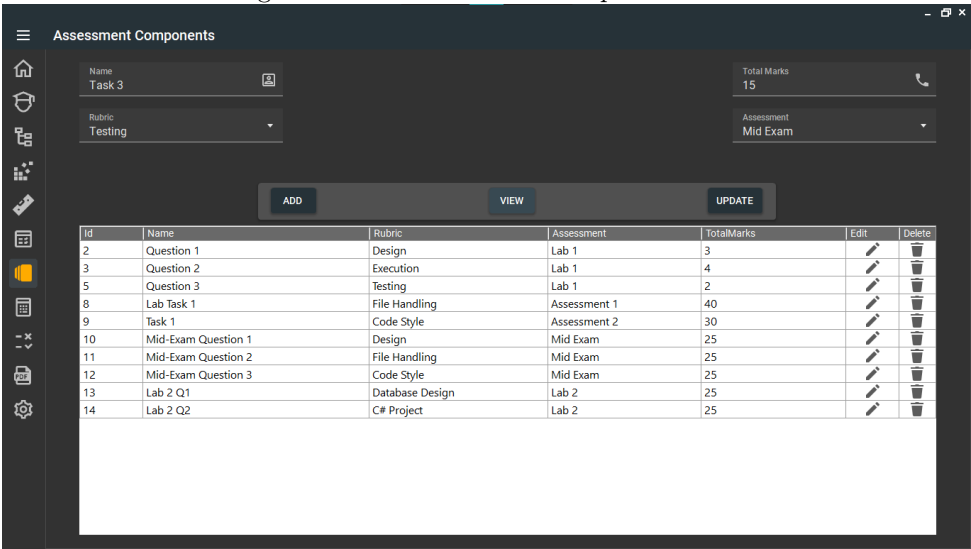
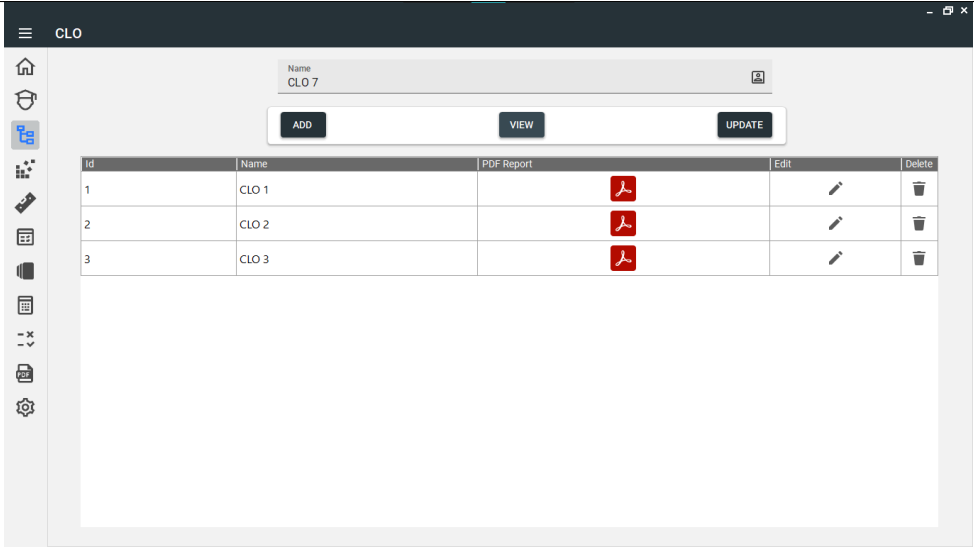
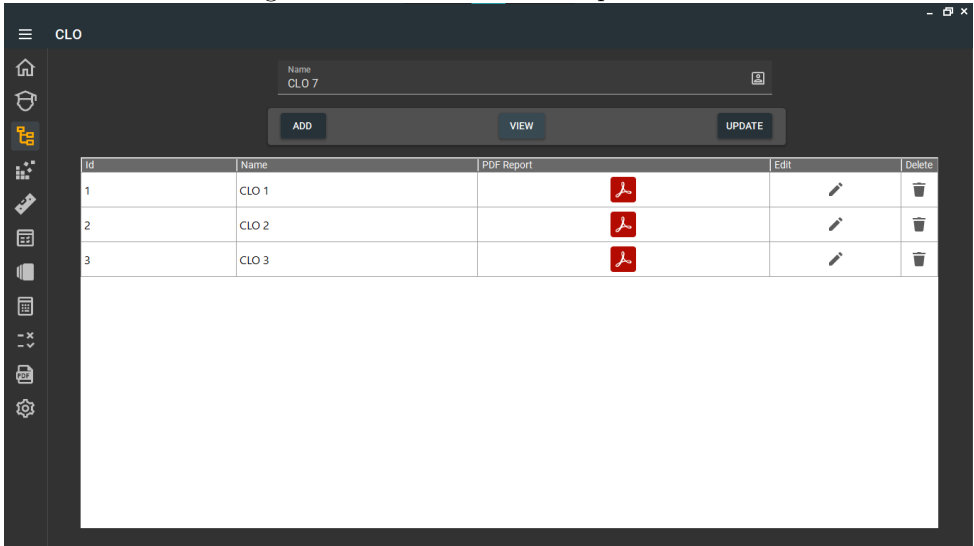


Figure 53: U27: Assessment Report Dark Theme Screen

2.28 CLO Wise Report

Table 29: U28: Save CLO Wise Report

Use Case ID	U28
Name	Save CLO Wise Report
Actor	User
Description	CLO screen has the pdf button in its data grid view adjacent to each CLO. You can generate pdf report of required CLO by pressing the button against to it.
UI	<div><div></div><div><p>Figure 54: U28: CLO Wise Report Screen</p></div><div><p>Figure 55: U28: CLO Wise Report Dark Theme Screen</p></div></div>

### 2.29 Attendance Report of certain Date

Table 30: U29: Save Attendance Report

Use Case ID	U29
Name	Save Attendance Report
Actor	User
Description	Class Attendance screen has the pdf button in its data grid view adjacent to each class attendance. You can generate pdf report of required class attendance by pressing the button against to it.

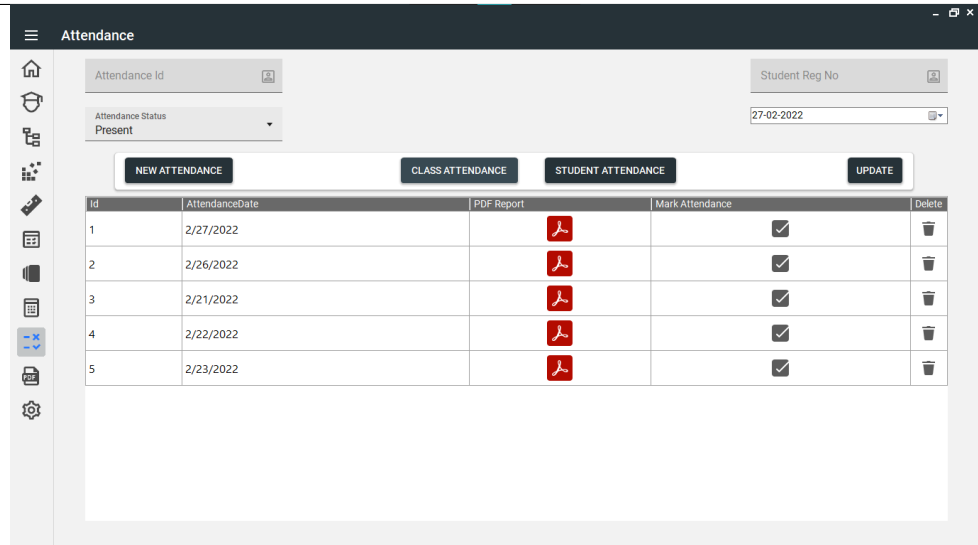


Figure 56: U29: Class Attendance Report Screen

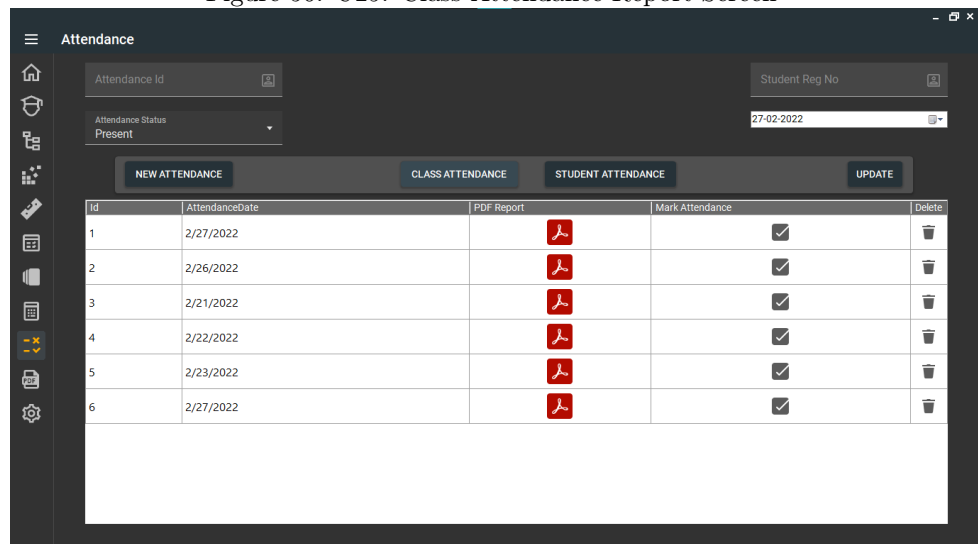
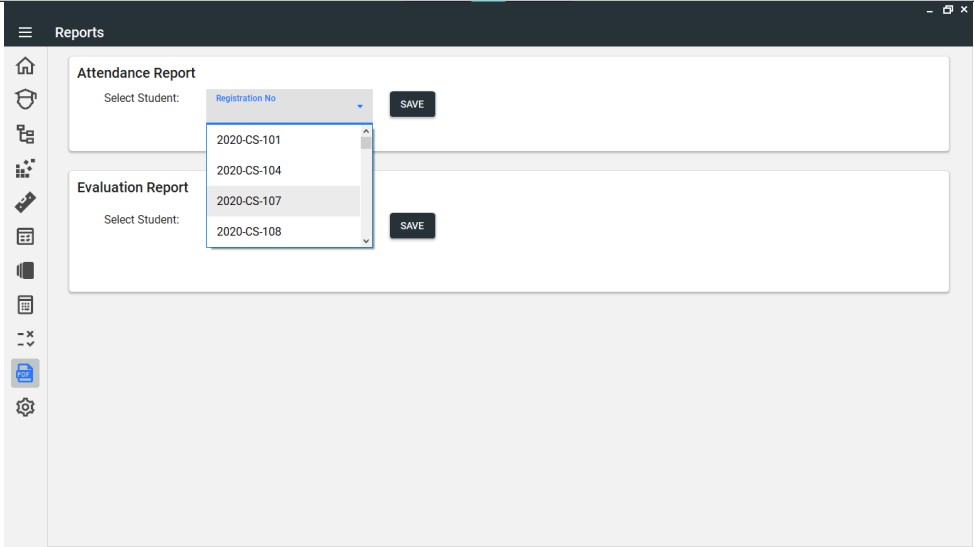
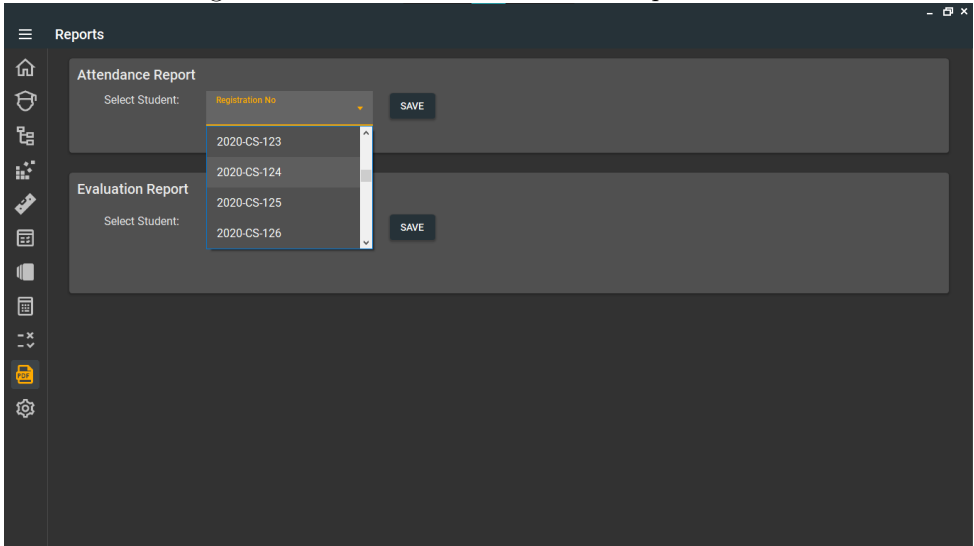


Figure 57: U29: Class Attendance Report Dark Theme Screen

UI

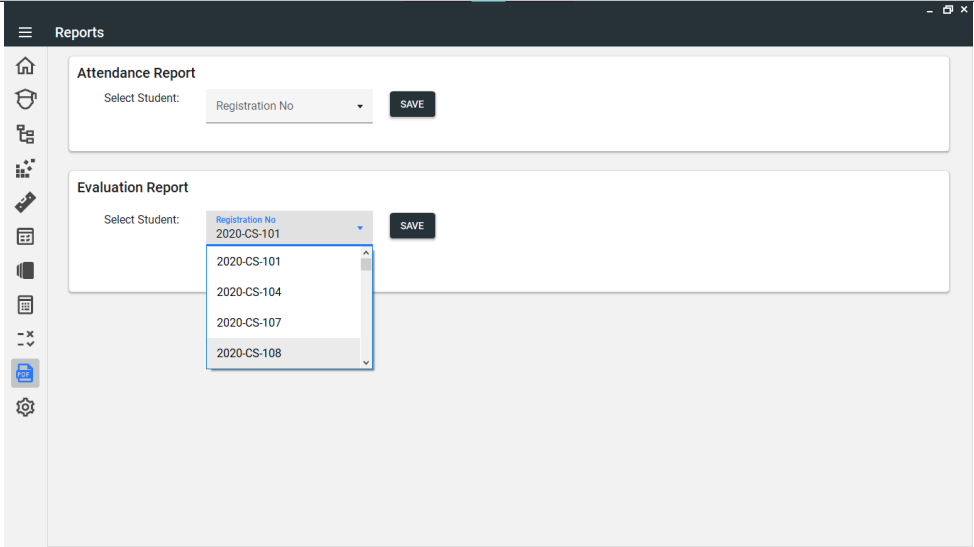
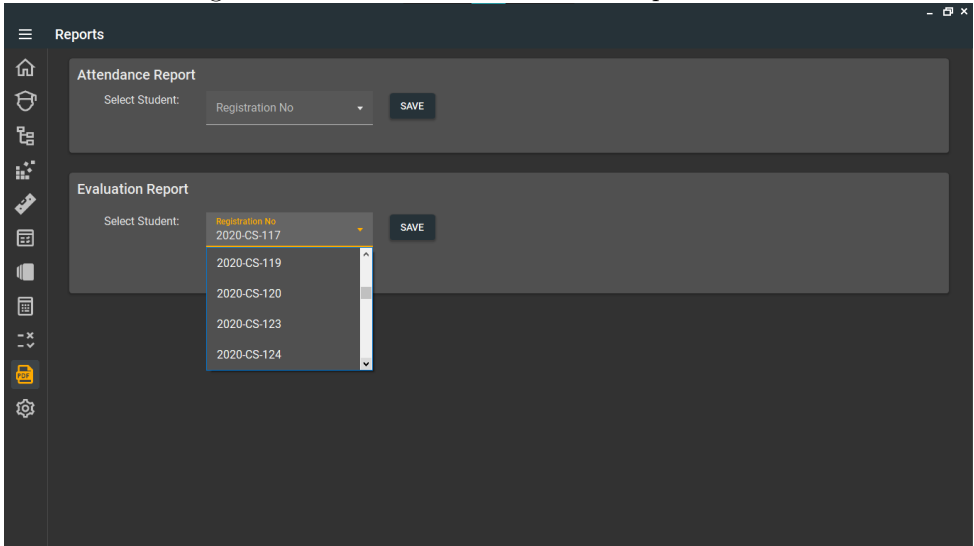
2.30 Report of All Assessment of a Student

Table 31: U31: Save Assessment of a Student

Use Case ID	U31
Name	Save Assessment of a Student
Actor	User
Description	Reports screen has the save button in the Evaluation Report block. You can generate pdf report of required student by selecting student registration number from the combo box
UI	<div><div><div><div><div>Figure 58: U31: Student Assessment Report Screen</div></div><div><div><div>Figure 59: U31: Student Assessment Report Dark Theme Screen</div></div></div></div></div></div>

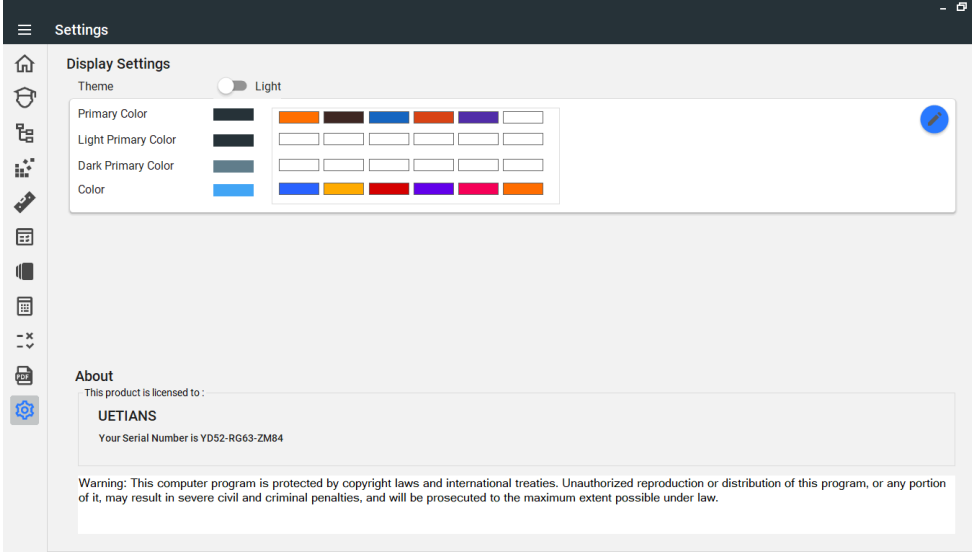
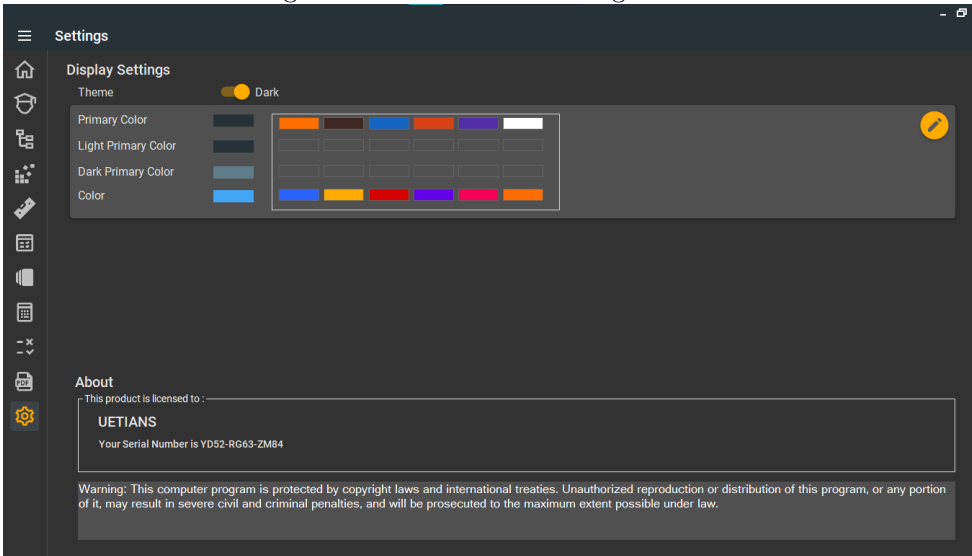
2.31 Report of All Attendances of a Student

Table 32: U32: Save Attendances of a Student

Use Case ID	U32
Name	Save Attendances of a Student
Actor	User
Description	Reports screen has the save button in the Attendance Report block. You can generate pdf report of required student by selecting student registration number from the combo box
UI	<div><div></div><div><p>Figure 60: U32: Student Attendance Report Screen</p></div><div><p>Figure 61: U32: Student Attendance Report Dark Theme Screen</p></div></div>

## 2.32 Light & Dark Theme

Table 33: U33: Switch Theme

Use Case ID	U33
Name	Switch Theme
Actor	User
Description	You can find theme switch option on the settings page that displays more color controls and application License key also.
UI	 <p>Figure 62: U33: Theme Setting Screen</p>  <p>Figure 63: U33: Dark Theme Setting Screen</p>

### 3 Pdf Generation Methodology

iTextSharp is a PDF library that allows you to create documents in the Portable Document Format (PDF) that makes it to easy to add pdf functionality. This package is used in this project to generate reports.

By the following line a document object will be created with page size A4 with left margin equal to 25, right margin equal to 25, Top margin equal to 50 and bottom margin equal to 25.

```
Document document = new Document(PageSize.A4, 25, 25, 50, 25);
```

 (1)

Using 2, a pdf file will be created that can be edited by using *PdfWriter* with arguments containing *Document* instance and file stream

```
PdfWriter.GetInstance(document, new FileStream(FileName, FileMode.Create));
```

 (2)

Open the document using 3 so that changes can be made into it

```
document.Open();
```

 (3)

Line 4 creates a new paragraph with text passed as an argument in its constructor. In below lines, font size, spacing, alignment is set using appropriate values.

```
Paragraph p1 = new Paragraph($"DatePrinted : {DateTime.Now}");
```

 (4)

```
p1.Font.Size = 8;
```

 (5)

```
p1.SpacingBefore = 5;
```

 (6)

```
p1.Alignment = 0;
```

 (7)

This line 8 adds the components to the object of document class that ultimately will be the page of pdf document.

```
document.Add(p1);
```

 (8)

Table can be added in pdf by creating an instance of *PdfPTable* class by passing number of columns as an argument in its constructor as follows

```
PdfPTable table = new PdfPTable(Columns);
```

 (9)

After creating the table instance fill the table using *AddCell()* method that will populate table cell by cell. Where *pCell* is an instance of *PdfPCell* class.

```
table.AddCell(pCell);
```

 (10)

When table is completely populated then for adding table to pdf document using the *Add()* method of document object and pass the table as a parameter i.e.,

```
document.Add(table);
```

 (11)

After you are done with adding content to the document don't forget to close using 12 the document object so as to save changes in the file and get our desired output i.e., pdf document

```
document.Close();
```

 (12)

### 4 PDF Reports

Five reports have been generated using iTextSharp library (above mentioned methodology) that are:



#### 4.1 Assessment Wise Report

It gives the result report of a certain assessment that contains the total and obtained marks of all students along with their registration numbers.

Following is the sample report:

Date Printed: 3/6/2022 12:39:43 AM

#### Assessment Result Report

Title: Assessment 2

Total Marks: 30

Total Weightage: 10

Registration Number	TOTAL MARKS	OBT MARKS
2020-CS-101	30	15
2020-CS-104	30	30
2020-CS-107	30	22.5
2020-CS-108	30	7.5
2020-CS-110	30	15
2020-CS-111	30	30
2020-CS-112	30	30
2020-CS-113	30	30
2020-CS-114	30	22.5
2020-CS-115	30	30

Figure 64: Assessment report

#### 4.2 CLO Wise Report

It gives the result report of a certain CLO that contains the assessment components mapped with this CLO and their total and obtained marks of all students along with their registration numbers.

Following is the sample report:

Date Printed: 3/6/2022 12:44:13 AM

## CLO Result Report

CLO : CLO 2

Following are the assessment components mapped to the clo:

Registration Number	Component	TOTAL MARKS	OBT MARKS
2020-CS-101	Mid-Exam Question 1	25	18.75
2020-CS-104	Mid-Exam Question 1	25	12.5
2020-CS-107	Mid-Exam Question 1	25	25
2020-CS-108	Mid-Exam Question 1	25	12.5
2020-CS-110	Mid-Exam Question 1	25	12.5
2020-CS-111	Mid-Exam Question 1	25	18.75
2020-CS-112	Mid-Exam Question 1	25	25
2020-CS-113	Mid-Exam Question 1	25	25
2020-CS-114	Mid-Exam Question 1	25	25
2020-CS-115	Mid-Exam Question 1	25	18.75
2020-CS-101	Question 1	3	1.5
2020-CS-104	Question 1	3	1.5
2020-CS-107	Question 1	3	3
2020-CS-108	Question 1	3	3
2020-CS-110	Question 1	3	0.75
2020-CS-111	Question 1	3	2.25
2020-CS-112	Question 1	3	2.25
2020-CS-113	Question 1	3	3
2020-CS-114	Question 1	3	3
2020-CS-115	Question 1	3	3
2020-CS-116	Question 1	3	3
2020-CS-117	Question 1	3	3
2020-CS-118	Question 1	3	3
2020-CS-119	Question 1	3	3
2020-CS-120	Question 1	3	2.25
2020-CS-123	Question 1	3	2.25
2020-CS-124	Question 1	3	2.25
2020-CS-125	Question 1	3	3

Figure 65: CLO report

### 4.3 Attendance Report

It provides the attendance report of certain **date** containing attendance id, registration number of all active students along with their attendance status.

Following is the sample report:

## Attendance Report

Date Printed: 3/8/2022 12:00:00 AM

AttendanceId	RegistrationNumber	Attendance Status
2	2020-CS-101	Absent
2	2020-CS-104	Present
2	2020-CS-107	Present
2	2020-CS-108	Present
2	2020-CS-110	Leave
2	2020-CS-111	Present
2	2020-CS-112	Present
2	2020-CS-113	Leave
2	2020-CS-114	Present
2	2020-CS-115	Present
2	2020-CS-116	Absent
2	2020-CS-117	Present
2	2020-CS-118	Leave
2	2020-CS-119	Present
2	2020-CS-120	Present
2	2020-CS-123	Present
2	2020-CS-124	Present
2	2020-CS-125	Present
2	2020-CS-126	Present
2	2020-CS-127	Present
2	2020-CS-128	Present
2	2020-CS-129	Present
2	2020-CS-130	Present
2	2020-CS-131	Present
2	2020-CS-132	Present
2	2020-CS-134	Present
2	2020-CS-135	Present
2	2020-CS-137	Present
2	2020-CS-138	Present
2	2020-CS-139	Present
2	2020-CS-141	Present
2	2020-CS-142	Present
2	2020-CS-143	Present
2	2020-CS-145	Present
2	2020-CS-146	Present
2	2020-CS-147	Present
2	2020-CS-148	Present
2	2020-CS-150	Present
2	2020-CS-152	Present
2	2020-CS-153	Present

Figure 66: Attendance report

#### 4.4 Student Attendance Report

It provides the attendance report of certain **Student** containing first name, last name, registration Number of that student, attendance status and the respective attendance date. It also displays the total presenties and absenties of that students;

Following is the sample report:

Students Report				
Date Printed: 3/6/2022 12:00:00 AM				
FirstName	LastName	RegistrationNumber	Status	Attendance Date
Asadullah	Bhatti	2020-CS-101	Present	27-02-22
Asadullah	Bhatti	2020-CS-101	Absent	26-02-22
Asadullah	Bhatti	2020-CS-101	Present	21-02-22
Asadullah	Bhatti	2020-CS-101	Present	22-02-22
Asadullah	Bhatti	2020-CS-101	Absent	23-02-22
			Total Presenties = 3	
			Total Absenties = 2	

Figure 67: Student Attendance report

#### 4.5 Student Assessment Report

It provides the result of a student in all the assessments that are created in the system that contains title of each assessment, its total marks, obtained marks and weightage along with the registration number of that student.

Following is the sample report: Figure 68

Date Printed: 3/8/2022 12:28:32 AM

## All Assessments Result Report

Title: Assessment 1

Total Marks: 60

Total Weightage: 40

Registration Number	TOTAL MARKS	OBT MARKS
2020-CS-101	40	40

Title: Assessment 2

Total Marks: 30

Total Weightage: 10

Registration Number	TOTAL MARKS	OBT MARKS
2020-CS-101	30	15

Title: Lab 1

Total Marks: 9

Total Weightage: 15

Registration Number	TOTAL MARKS	OBT MARKS
2020-CS-101	9	6

Title: Mid Exam

Total Marks: 75

Total Weightage: 35

Registration Number	TOTAL MARKS	OBT MARKS
2020-CS-101	75	43.75

Title: Lab 2

Total Marks: 50

Total Weightage: 25

Figure 68: Student Assessment report



8. Rubric
9. Rubric Level

## 7 Conclusion

### 7.1 Final application

The current version of application has following features in working and complete state:

- CLO management
- Attendance marking
- Rubric & Rubric level mapping
- Assessment management
- Student Result evaluation
- PDF Reports Generation
- Light and Dark Theme Switch

It is a single user application with the features to manage only one course at a time.

### 7.2 Future improvements

This project can be improved and upgraded to a full management system that manages multiple courses at a time. It can be made multi user with student accounts that provides them access to view assessment results, attendance report and many more according to the requirements.