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School Management System (DBMS)

*Course Title : Databases Lab
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<u>Lab Project Status</u>	
Marks:	Signature:
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Chapter 1

Introduction

1.1 Overview

The School Management System project, implemented in Java, streamlines administrative tasks within educational institutions. It efficiently manages student main menu, login page, add student, search student, staff information, student information, and Teacher information. With a user-friendly interface, it facilitates easy communication between administrators, teachers, and parents. This Java-based system automates routine processes, enhancing overall school efficiency and organization.

1.2 Motivation

This School Management System project is motivated by the pressing need to modernize and streamline educational institutions' administrative functions. Recognizing the challenges faced in managing student and staff data manually, this project aims to enhance efficiency and communication within schools. By leveraging technology, the system addresses complexities in record-keeping, attendance tracking, and communication channels. Ultimately, the motivation is to empower educational institutions with a comprehensive and user-friendly solution for improved administrative processes.

1.3 Problem Definition

1.3.1 Problem Statement

Inefficient manual management of student and staff data in educational institutions creates bottlenecks and communication gaps. The absence of a streamlined system hinders administrative processes, leading to errors and delays. This School Management System project seeks to address these challenges by automating tasks, improving accuracy, and fostering seamless communication for enhanced overall efficiency in schools.

1.3.2 Complex Engineering Problem

Designing a scalable and secure School Management System presents a complex engineering challenge. Balancing real-time data updates, ensuring data integrity, and implementing robust security measures to protect sensitive student and staff information demand intricate system architecture and meticulous engineering to create a reliable and efficient solution for educational institutions.

Table 1.1: Complex Engineering Problem Steps

Name of the P Attributess	Explain how to address
P1: Depth of knowledge re-quired	Developing a school management system with MySQL requires a deep understanding of database design, SQL queries, user interface development, and integration skills for a comprehensive project.
P2: Range of conflicting re-quirements	Developing a school management system with MySQL involves balancing conflicting requirements, such as user-friendly interfaces, data security, scalability, and real-time updates, requiring thoughtful trade-offs and compromises.
P3: Depth of analysis required	Creating a school management system with MySQL demands in-depth analysis, encompassing user needs, database structure, security protocols, and system scalability, ensuring a robust and effective solution.
P4: Familiarity of issues	Executing a this with MySQL necessitates familiarity with key issues like data normalization, user authentication, and optimizing queries for efficient database performance and responsiveness.

1.4 Design Goals/Objectives

The design goals for a school management system with MySQL include creating a user-friendly interface, ensuring data integrity and security, optimizing database structure for efficient queries, implementing role-based access controls, and facilitating scalability. The objective is to provide a comprehensive solution that enhances administrative tasks, improves communication, and supports seamless management of academic and non-academic aspects within the educational institution.

1.5 Application

The school management system, powered by MySQL, streamlines administrative tasks, student enrollment, and grade tracking. It offers a user-friendly interface for teachers, students, and administrators, ensuring efficient communication and data management. With secure authentication and optimized database queries, the application enhances overall school operations, fostering an organized and technologically advanced educational environment.

Chapter 2

Design/Development/Implementation of the Project

2.1 Introduction

The School Management System, powered by a robust DBMS, offers a comprehensive solution with modules for student addition, admin-panel management, fee tracking, result processing, student portal, staff administration, and teacher information. This project caters to the evolving needs of educational institutions through a centralized platform for efficient data handling. With user-friendly interfaces and seamless integration of essential features, the report explores the development and implementation of each module, highlighting the system's role in creating an organized, accessible, and technologically advanced school environment.

2.2 Project Details

The School Management System project is built on a comprehensive Database Management System (DBMS) that enables essential functionalities such as student enrollment, admin panel administration, fee management, result processing, student portal, staff administration, and teacher information management. Each module is designed with dedicated tables to ensure efficient organization of data. The student addition module handles enrollment, while the admin panel oversees system administration. Fee management keeps track of financial transactions, and result processing automates grading. The student portal provides personalized access, and staff administration manages employee details. The teacher information tables store relevant data, creating a robust, integrated, and user-friendly solution for school management.

2.3 Implementation

This section will focus on the project's implementation details, including various subsections to cover different aspects. This is just a sample subsection. Subsections should be written in detail. Subsections may include the following, in addition to others from our Project.

2.3.1 The workflow

The School Management System follows a systematic workflow for seamless integration of its modules. It begins with student enrollment, overseen by the admin-panel for user access and system maintenance. Fee management handles financial transactions, while result processing automates grading procedures. The student portal grants personalized access to students, serving as a centralized platform for academic information. Staff administration manages employee details, and teacher information tables store essential data. This cohesive workflow, supported by a robust DBMS, ensures streamlined, efficient, and user-friendly school management, enhancing organizational effectiveness and accessibility.

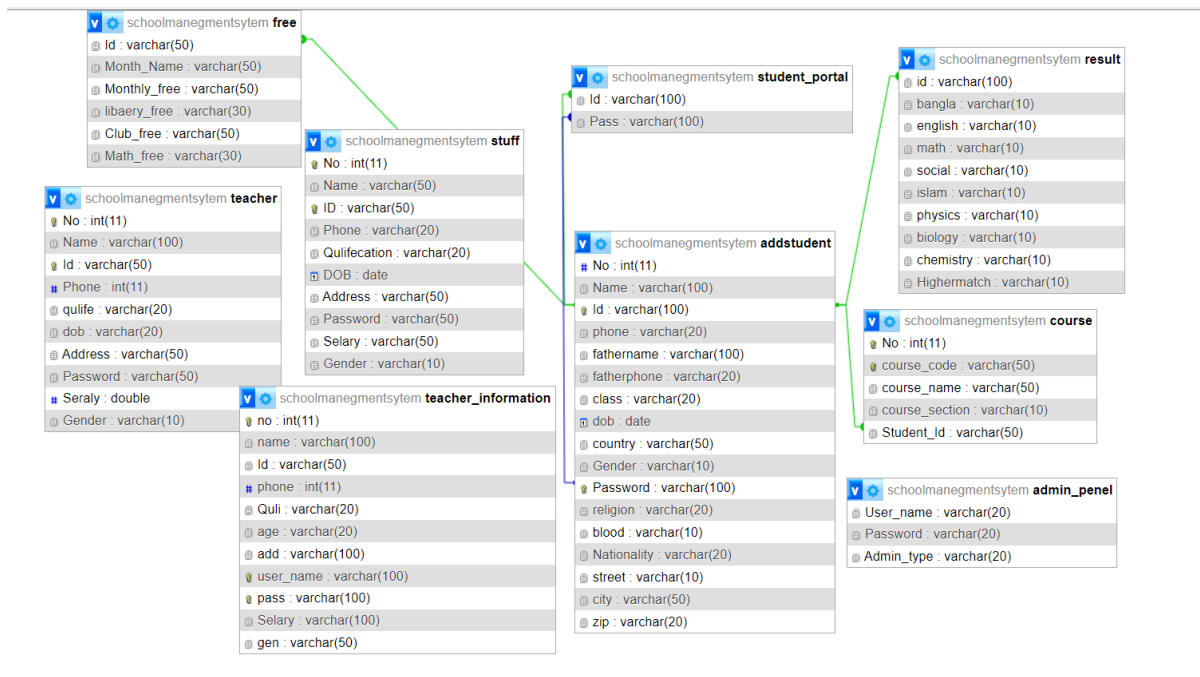
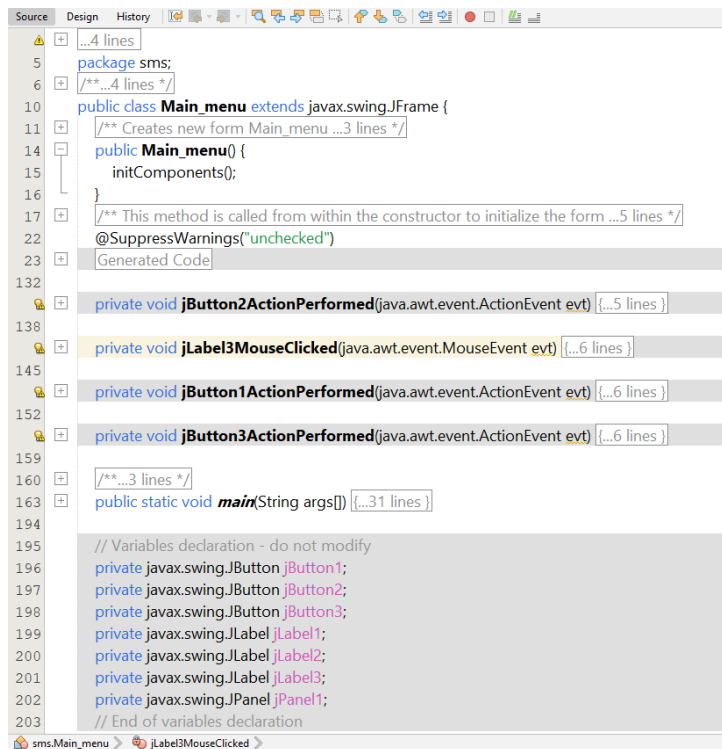


Figure 2.1: This project Structure .

2.3.2 Tools and libraries

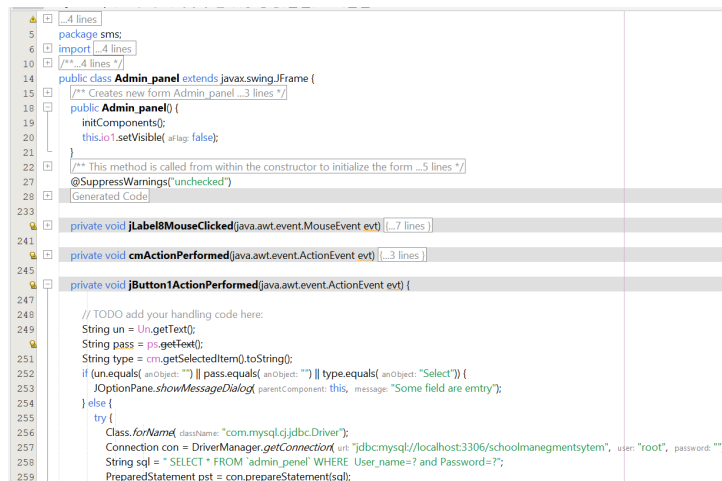
The School Management System utilizes a combination of tools and libraries to facilitate smooth development. Java is employed as the primary programming language due to its versatility and platform independence. NetBeans, an integrated development environment, simplifies coding, debugging, and testing processes. XAMPP provides a local server environment, ensuring efficient database management with MySQL. These technologies synergistically enable the implementation of key modules such as student addition, admin-panel, fee management, result processing, student portal, staff administration, and teacher information tables. The integration of Java, NetBeans, XAMPP, and MySQL enhances the system's functionality and ensures a reliable School Management System.

2.3.3 Programming codes



```
Source Design History
...4 lines
5 package sms;
6 /**...4 lines */
10 public class Main_menu extends javax.swing.JFrame {
11     /** Creates new form Main_menu ...3 lines */
14     public Main_menu() {
15         initComponents();
16     }
17     /** This method is called from within the constructor to initialize the form ...5 lines */
22     @SuppressWarnings("unchecked")
23     Generated Code
132 private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {...5 lines}
138 private void jLabel3MouseClicked(java.awt.event.MouseEvent evt) {...6 lines}
145 private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {...6 lines}
152 private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {...6 lines}
159 /**...3 lines */
163 public static void main(String args[]) {...31 lines}
194
195 // Variables declaration - do not modify
196 private javax.swing.JButton jButton1;
197 private javax.swing.JButton jButton2;
198 private javax.swing.JButton jButton3;
199 private javax.swing.JLabel jLabel1;
200 private javax.swing.JLabel jLabel2;
201 private javax.swing.JLabel jLabel3;
202 private javax.swing.JPanel jPanel1;
203 // End of variables declaration
```

Figure 2.2: This project main menu code .



```
...4 lines
5 package sms;
6 import ...4 lines
10 /**...4 lines */
14 public class Admin_panel extends javax.swing.JFrame {
15     /** Creates new form Admin_panel ...3 lines */
18     public Admin_panel() {
19         initComponents();
20         this.setVisible(false);
21     }
22     /** This method is called from within the constructor to initialize the form ...5 lines */
27     @SuppressWarnings("unchecked")
28     Generated Code
233 private void jLabel8MouseClicked(java.awt.event.MouseEvent evt) {...7 lines}
241 private void cmActionPerformed(java.awt.event.ActionEvent evt) {...3 lines}
245 private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {
247     // TODO add your handling code here:
248     String un = un.getText();
249     String pass = ps.getText();
251     String type = cm.getSelectedItem().toString();
252     if (un.equals("") || pass.equals("") || type.equals("Select")) {
253         JOptionPane.showMessageDialog(parentComponent, this, "Some field are empty");
254     } else {
255         try {
256             Class.forName("com.mysql.cj.jdbc.Driver");
257             Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/schoolmanagementsystem", user, "root", password);
258             String sql = "SELECT * FROM `admin_panel` WHERE User_name=? and Password=?";
259             PreparedStatement pst = con.prepareStatement(sql);
```

Figure 2.3: This project Admin Panel page code .


```

Source  Design  History
+ ...4 lines
5  package sms;
6  import ...4 lines
10 + /** ...4 lines */
14  public class Student_Portal extends javax.swing.JFrame {
15  + /** Creates new form Student_Portal ...3 lines */
18  + public Student_Portal() {...3 lines }
21  + public Student_Portal(String un1) {...4 lines }
25  + /** This method is called from within the constructor to initialize the form ...5 lines */
30  @SuppressWarnings("unchecked")
31  + Generated Code
222
+ private void ckActionPerformed(java.awt.event.ActionEvent evt) {...9 lines }
232
+ private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {...36 lines }
269
+ private void jLabel3MouseClicked(java.awt.event.MouseEvent evt) {
271      // TODO add your handling code here:
272
273      Admin_panel ap = new Admin_panel();
274      ap.setVisible( b: true);
275  }
276
+ /** ...3 lines */
280 + public static void main(String args[]) {...31 lines }
311
312 // Variables declaration - do not modify
313 private javax.swing.JCheckBox ck;
314 private javax.swing.JButton jButton1;
315 private javax.swing.JLabel jLabel1;
316 private javax.swing.JLabel jLabel2;
317 private javax.swing.JLabel jLabel3;

```

sms.Student_Portal

Figure 2.4: This project Student portal page code .

In this figure 2.4 given code student portal but another two portal like teacher and stuff portal page so not given this two picture because we do not want as long this assignment . we tell that student portal , teacher portal and stuff portal are same .

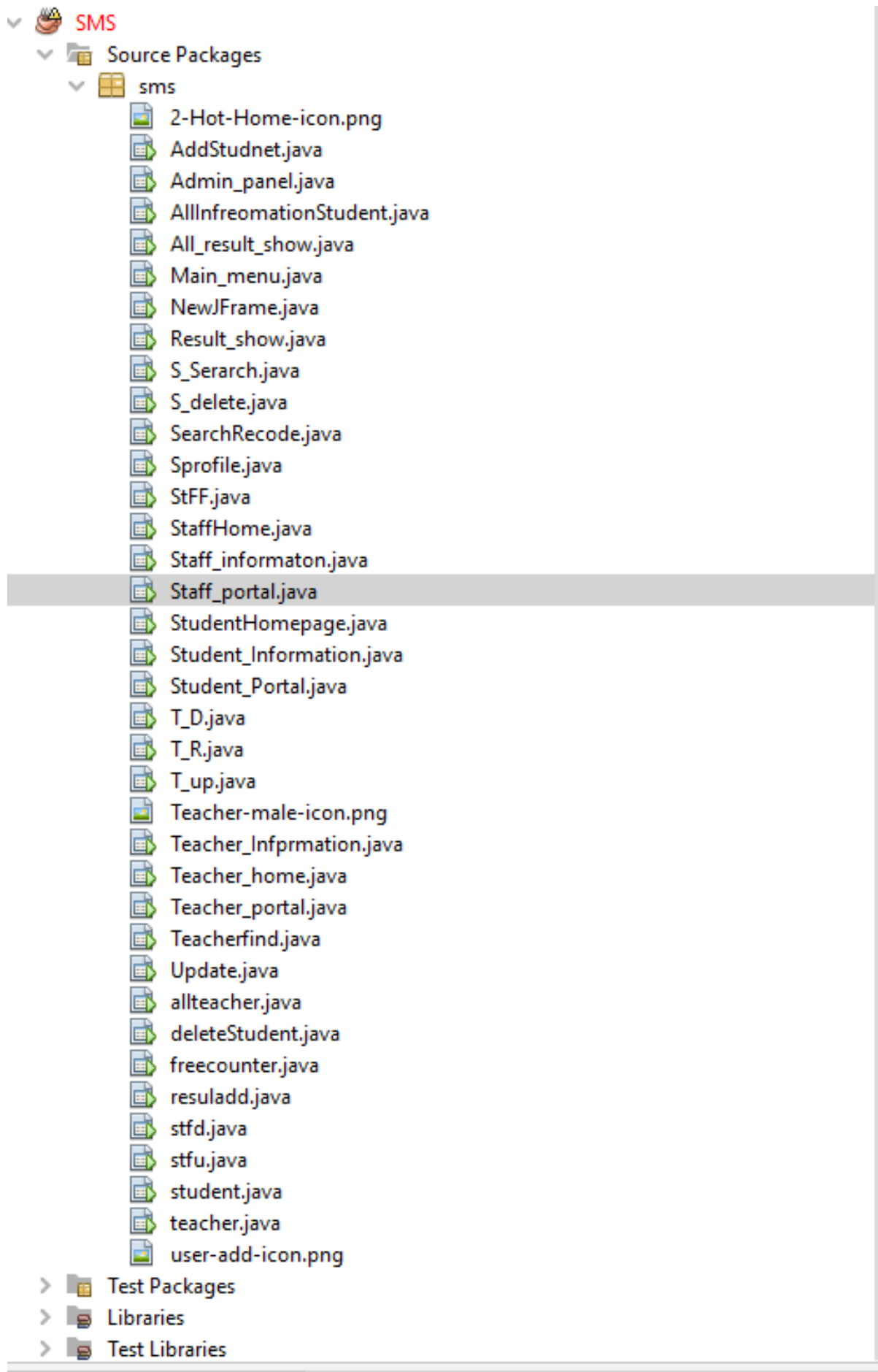


Figure 2.5: This project has 35 interface we could not show all interface in the report , so see this part for understand our project depth. 9

Chapter 3

Performance Evaluation

3.1 Simulation Environment/ Simulation Procedure

To simulate the outcomes of our project, me and my teammate have set up different experimental setups based on my PC configurations. In this section, we will discuss the specific requirements and environment installation needed for each simulation.

3.1.1 Dulal PC

For your simulation, the following experimental setup and environment installation are needed: RAM: 16GB , Storage: 512 GB SSD and 1TB HDD, Processor: Intel Core i5 10th generation.

3.1.2 Shajid PC

For your simulation, the following experimental setup and environment installation are needed: RAM: 8GB , Storage: 250 GB SSD , Processor: Intel Core i3 8th generation.

3.2 Results Analysis/Testing

The Results Analysis and Testing phase of the School Management System involves a comprehensive examination of each module. Student addition undergoes thorough validation checks to ensure accurate enrollment, while the admin-panel is scrutinized for smooth system administration. Fee management is tested for precise financial tracking, and result processing is evaluated to ensure accurate grading procedures. The student portal is examined for user-friendly access, and staff administration is validated for data accuracy regarding employee details. The teacher and teacher information tables undergo rigorous testing to ensure proper storage and retrieval of data. This meticulous testing process guarantees the reliability, efficiency, and integrity of the entire School Management System, creating a robust and error-free solution for managing school operations.

3.2.1 Result_portion_Add Student

ULLAPARA GOVT MODEL SCHOOL

Log out

NAME: MRA

ID: 213902098

Phone: 01734567890

Father_name: kader

Father_Phone : momotaj

Password: *****

Religion: islam

Blood Group: O+

Class: 7

Date Of birth: 1999-11-25

Nationality: ban

bd

pukurpar

patuakhali

Zip: 5678

Gender: Female

Message

New Profile has created Successfully

OK

Save Back

Figure 3.1: Add Student Successfully .

In this Figure 3.1 ,see that user added a new student information so our ST system show that new student added successfully.

3.2.2 Result_portion_Logging Students

ULLAPARA GOVT MODEL SCHOOL

Log out

STUDENT_PORTAL

ID: 213902116

Password: *****

Show

Log in

Home

ResultHistory

Bill History

Profile

Class Routine

WELCOME UMS STUDENT PORTAL

Figure 3.2: Logging Students Successfully .

In this Figure 3.2 see that student portal logging Successfully . in figure 3.1 show user added a student .then this figure 3.2 show login successfully.

3.2.3 Result_portion_Result Addition

Welcome result update

ULLAPARA GOVT MODEL SCHOOL

Back

STUDENT RESULT

Message: Insert new result

ID: 390209

Bangla: 80

English: 99

Math: 67

Social: 67

Islamic: 99

Physics: 88

Biology: 77

Chemistry: 87

H.math: 87

Update result

Figure 3.3: Result Addition Successfully .

In this Figure 3.3 see user added the result for student and DST system show that Added result is successfully .

3.2.4 Result_portion_Show Result

Welcome Student portal

ULLAPARA GOVT MODEL SCHOOL

Log out

Name: MD Dulal ID: 213902116 show

	Total Mark:	Pass Mark:
Bangla: 80	100	40
English: 80	100	40
Math: 80	100	40
Social: 75	100	40
Islam: 70	100	40
Physics: 80	100	40
Biology: 80	100	40
Chemist...: 70	100	40
H.math: 100	100	40

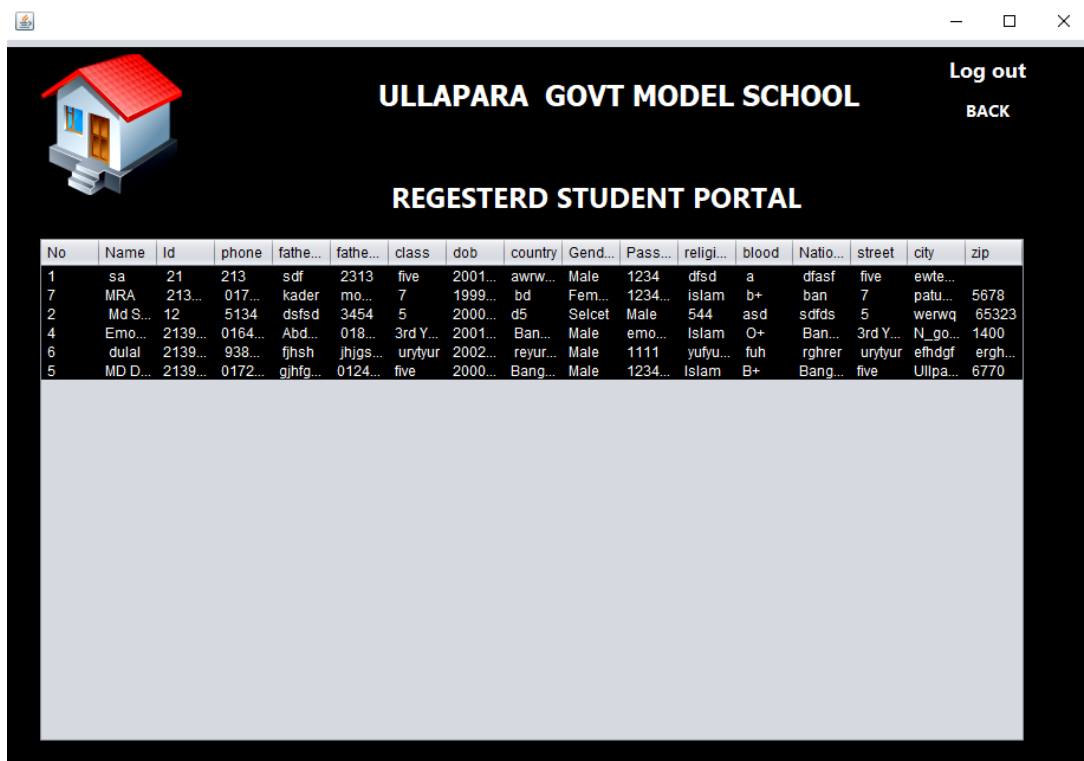
Passed: 79.44444444444444

Total Mark: 715.0

Figure 3.4: Result Show Successfully .

we know figure 3.3 added student result. so In this Figure 3.4 we want to show the student result and see that result show successfully.

3.2.5 Result_portion_Register's Students



No	Name	Id	phone	fathe...	fathe...	class	dob	country	Gend...	Pass...	religi...	blood	Natio...	street	city	zip
1	sa	21	213	sdf	2313	five	2001...	awrw...	Male	1234	dfsd	a	dfasf	five	ewte...	
7	MRA	213...	017...	kader	mo...	7	1999...	bd	Fem...	1234...	islam	b+	ban	7	patu...	5678
2	Md S...	12	5134	dsfsd	3454	5	2000...	d5	Selcet	Male	544	asd	sdfds	5	werwq	65323
4	Emo...	2139...	0164...	Abd...	018...	3rd Y...	2001...	Ban...	Male	emo...	Islam	O+	Ban...	3rd Y...	N_go...	1400
6	dulal	2139...	938...	fjhsh	jhgs...	unytyr	2002...	reyur...	Male	1111	yufyu...	fuh	rghrer	unytyr	efhdgf	ergh...
5	MD D...	2139...	0172...	ghfg...	0124...	five	2000...	Bang...	Male	1234...	Islam	B+	Bang...	five	Ullpa...	6770

Figure 3.5: Register's Students Show Successfully .

we know figure 3.5 we want to show all the register student and see the our table show that successfully .

3.2.6 Result_portion_stuff Page Login





ULLAPARA GOVT MODEL SCHOOL

STAFF PORTAL

ID:

Password:

WELCOME TO PORTAL

ULLAPARA GOVT MODEL SCHOOL

SERALY **ATTENDENCE** **REPORT CARD**

Figure 3.6: Stuff Page Login Successfully .

3.2.7 Result_portion_Teacher Page Login

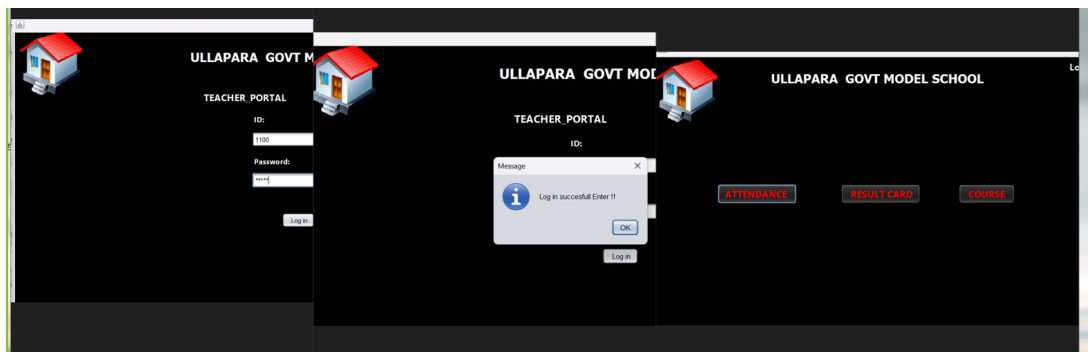


Figure 3.7: Teacher Page Login Successfully .

3.2.8 Result_portion_Database Part Some pictuer

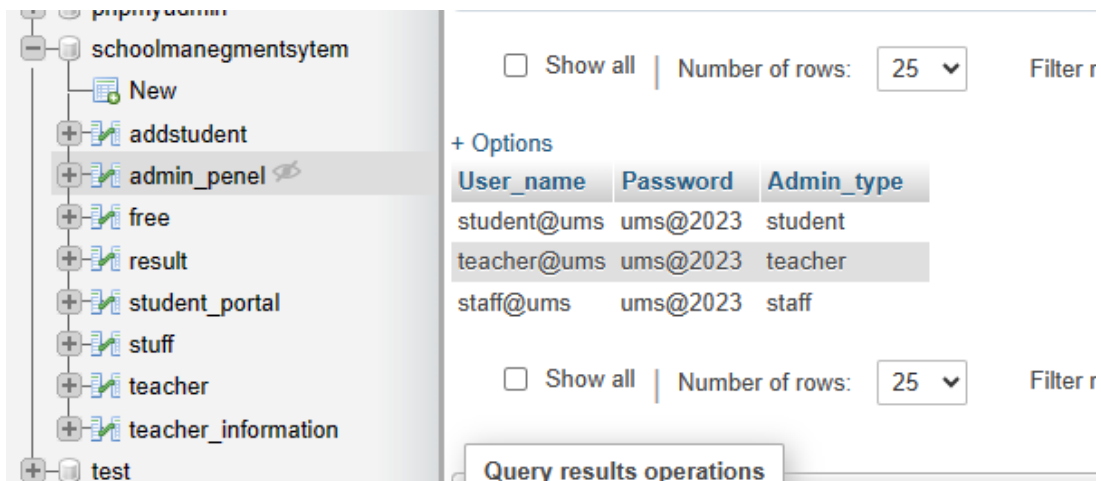


Figure 3.8: Admin Panel Database Table .

No	Name	Id	phone	fathername	fatherphone	class	dob	country	Gender	Password	religion	blood	Nationality	street	city	zip
1	sa	21	213	sdf	2313	five	2001-05-11	awrwer4	Male	1234	dfsd	a	dfasf	five	ewtedry20	
7	MRA	213902098	01734567890	kader	momotaj	7	1999-11-25	bd	Femele	123456	islam	b+	ban	7	patuakhail	5678
2	Md Sahjid hassan11	12	5134	dsfsd	3454	5	2000-11-05	d5	Selcet	Male	544	asd	sdfds	5	werwq	65323
4	Emon hassan	213902032	01641957957	Abdul Hai	01828482310	3rd Year	2001-07-14	Bangladeshi	Male	emon1234	Islam	O+	Bangladesh	3rd Year	N_gong	1400
6	dulal	213902115	93847565	fjhsh	jhgajgd	urytyur	2002-11-23	reyyryue	Male	1111	yufyufgy	fuh	rghrer	urytyur	efhdgf	erghdgh
5	MD Dulal	213902116	01721845455	ghfhdg	012457631	five	2000-12-03	Bangladesh	Male	123456	Islam	B+	Bangladeshi	five	Ullpara	6770

Figure 3.9: Add Student Database Table .

No	Name	Id	Phone	qulife	dob	Address	Password	Seraly	Gender
6	Md Shajid	10001	1761453698	INTER	1999/12/12	ulllpara,sirajgong	123456789	500000	Male
8	Shahadot	1100	121801798	BSC	2000-12-03	ullapara	12345	15000	Male

Figure 3.10: Teacher Database Table .

no	name	Id	phone	Quli	age	add	user_name	pass	Selary	gen
1	dsjks	sdfssafs	45435121	sdfsdadf	sdfa	aedfa	sae	sdf		Male
2	jnfjks	kkSDNF	54121	KDJNFK	DKNF	SDBFK	U1	12	10000	Male

Figure 3.11: Teacher Info. Database Table .

Id	Month_Name	Monthly_free	libaery_free	Club_free	Math_free
213902032	may	12000	1000	500	200

Figure 3.12: Free Database Table .

id	bangla	english	math	social	islam	physics	biology	chemistry	Highermatch
12	23	23	23	23	23	23	23	23	23
213902032	80	80	90	95	80	80	65	65	100
213902032	78								
213902116	80	80	80	75	70	80	80	70	100
213902098	80	99	67	67	99	88	77	87	87

Figure 3.13: Result Database Table.

3.3 Results Overall Discussion

The Results Overall Discussion of the School Management System highlights the successful implementation and integration of essential modules. Student addition and admin-panel boast user-friendly functionality. Fee management ensures accurate financial tracking, while result processing demonstrates precise grading. The student portal offers accessible academic information, and staff administration streamlines employee data. Teacher information tables ensure efficient data storage. These outcomes affirm the system's effectiveness in optimizing school management processes through seamless module integration, enhancing organizational efficiency and providing a technologically advanced solution for educational institutions.

Chapter 4

Conclusion

4.1 Discussion

The discussion section of the School Management System project report explores the impact and implications of the system. It highlights the successful integration of modules such as student addition, admin-panel, fee management, result processing, student portal, staff administration, and teacher information tables. The user-friendly interfaces and efficient data handling demonstrate the system's practicality. The streamlined processes contribute to organizational efficiency, reducing manual workload and minimizing errors. Furthermore, the system's scalability and adaptability ensure its relevance for various educational institutions. The discussion emphasizes the project's significance in advancing school management practices through the effective use of Database Management System (DBMS) technologies.

4.2 Limitations

One drawback of our project is the teacher attendance sheet interface. It is not fully functional, particularly in terms of marking student attendance accurately. This poses a challenge for us.

Another drawback is with the student result card. The displayed results do not properly reflect the students' performance due to a database problem. We are committed to resolving this issue.

The third major concern we have is with the monthly payment system. While the payment system works well when developed in Java, we encounter difficulties when connecting it to the database. This is a challenge we must address.

4.3 Scope of Future Work

Parent-Teacher Communication Platform :

Develop a communication module that facilitates efficient and real-time communication between parents and teachers. This could include features such as messaging, progress updates, and event notifications.

Student Attendance Tracking System :

Implement an advanced attendance tracking system that uses biometrics or RFID technology. This would provide accurate and automated attendance records, reducing manual efforts and minimizing error.

Library Management System :

Enhance the SMS by integrating a library management system. This module could include features for cataloging books, tracking borrowing history, and managing library resources.

Teacher Professional Development Module :

Implement a module for tracking and managing teacher professional development activities, certifications, and training programs. This would contribute to ongoing teacher improvement and compliance.

Data Analytics and Reporting Tools :

Implement advanced data analytics and reporting tools to provide in-depth insights into various aspects of the school's performance. This could include visualizations, trend analysis, and predictive analytics.

Online Exam and Assessment Module :

Integrate an online examination and assessment module to conduct quizzes, exams, and assessments digitally. This would streamline the evaluation process and provide instant feedback to both students and teachers.

4.4 References

1. <https://www.mysql.com/>
2. <https://www.codecademy.com/learn/learn-sql>
3. <https://www.w3schools.com/sql/>
4. <https://www.geeksforgeeks.org/java/?ref=outind>
5. <https://www.javatpoint.com/java-tutorial>
6. <https://www.learnjavaonline.org/>