JGi JAIN DEEMED-TO-BE UNIVERSITY | SCHOOL OF COMPUTER SCIENCE AND IT

Department of Computer Science & Information Technology

Programme: Master of Science in Computer Science & Information Technology

[MSc-CS&IT]

Certificate

This is to certify that **Mr. Ashish Khadela, Mr. Kaushal Muniwala and Mr. Yash Mandaliya** has satisfactorily completed the course of **Activity – 2** prescribed by the JAIN(Deemed-to-be-University) for the **semester 2** M.Sc. – CS & IT degree course in the year 2024 - 2026.

Date: 28/03/2025

Signature of Student | Head of the Department | Signature of Faculty In charge

JGi JAIN DEEMED-TO-BE UNIVERSITY | SCHOOL OF COMPUTER SCIENCE AND IT

PROGRAM: MASTER OF SCIENCE IN COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

[M.Sc. - CS & IT]

Mini Project

Student Management System

Semester - 2

Submitted To:

Dr M N Nachappa

Prof. Haripriya V.

Prof. Raghavendra R.

Submitted By:

Ashish Khadela (24MSRCI012)

Kaushal Muniwala (24MSRCI013)

Yash Mandaliya (24MSRCI028)

Student Management System

- ## Title Page

Project Title: Student Management System

Project Type: Mini Project

Course: Advance Database Management System
Human-Computer Interaction
Python Programming

Submitted By: Ashish Khadela (24MSRCI012)
Kaushal Muniwala (24MSRCI013)
Yash Mandaliya (24MSRCI028)

Date Of Submission: 01-04-2025

• Abstract

1. Project Proposal

Purpose:

The Student Management System (SMS) is a software application designed to manage student records efficiently. It allows administrators and teachers to store, modify, and retrieve student information such as personal details, academic records and attendance record. The system enhances efficiency, reduces paperwork, and ensures data accuracy.

Objectives:

- Store and manage student details securely.
- Provide an easy-to-use interface for administrators.
- Allow CRUD (Create, Read, Update, Delete) operations on student data.
- Implement an attendance tracking system to record student presence.
- Ensure data integrity using MySQL as the backend database.

---

2. Features to be Implemented

1. User Authentication:
    - Admin login with credentials (Email, Password).
2. Student Record Management:
    - Add, update, delete student information (name, age, gender, class, contact details).
3. Course Management:
    - Assign students to courses.
4. Grade Management:
    - Store, update, and display student grades.
5. Search and Filtering:
    - Search students by name, roll number, or class.

6. Attendance Management:
    - Teachers can record student attendance (Present or Absent)
    - Attendance history can be retrieved and displayed.
7. Report Generation:
    - Generate student reports (performance, course details).
8. GUI Interface:
    - Tkinter for user-friendly forms and tables.

---

3. Features to be Implemented

Programming Language: Python

Integrated Development Environment (IDE): VS Code

Database Management System (DBMS): MySQL (using MySQL Workbench)

Human-Computer Interaction (HCI) Framework: Tkinter (for GUI development)

Table Of Contents

• Abstract

The Student Management System (SMS) is a desktop-based application developed using Python (Tkinter) for the frontend and MySQL for the backend. The system provides functionalities such as student registration, course management, attendance tracking, result management, and user authentication (login, register, forgot password).

The project follows CRUD (Create, Read, Update, Delete) operations for database interactions and ensures a user-friendly interface with Tkinter GUI. The system helps educational institutions automate student data management efficiently.

- **Dashboard** for quick navigation
- **Manage Course** for adding, updating, and deleting courses
- **Manage Students** for student record management
- **Manage Results** for storing and retrieving student grades
- **View Results** for student performance analysis
- **Manage Attendance** for tracking student participation
- **Authentication System** with Login, Register, and Forgot Password

Key Technologies Used:

- **Frontend:** Tkinter (Python)
- **Backend:** Python
- **Database:** MySQL (MySQL Workbench)

• Introduction

Background & Motivation

Managing student records manually can be **time-consuming and error-prone**. This system automates record-keeping and ensures **efficient data handling**.

Problem Statement

The system aims to address challenges in managing student details, results, and attendance efficiently in an educational institution.

Educational institutions require an **automated system** to handle:

- **Student registration**
- **Course allocation**
- **Attendance tracking**
- **Result management**

Relevance of DBMS & HCI

- **DBMS (MySQL)** ensures structured data storage.
- **HCI (Tkinter GUI)** provides an intuitive user experience.

Report Overview

This document outlines system design, implementation, testing, and potential improvements.

• Objectives

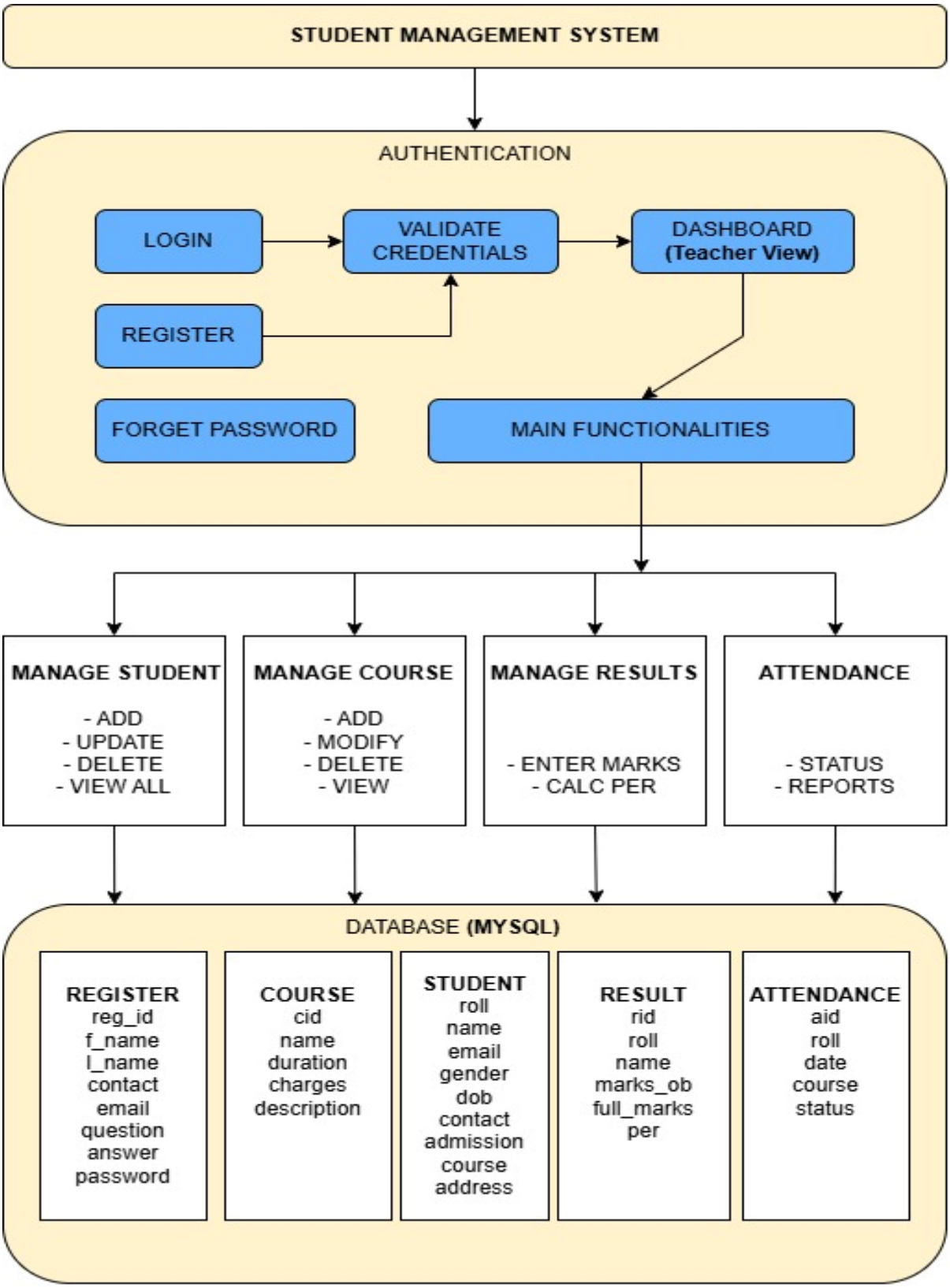
1. To develop a **Tkinter-based GUI** for easy interaction.
2. To implement **MySQL database** for storing student records.
3. To provide **secure authentication** (login, register, forgot password).
4. To enable **CRUD operations** for students, courses, attendance, and results.
5. To ensure **user-friendly navigation** (HCI principles).

• Technologies Used

Programming Language :	Python
DBMS :	MySQL
User Interface Tools :	Tkinter
Other Tools :	MySQL (MySQL Workbench), VS Code
Libraries :	mysql-connector-python, tkinter, messagebox, ttk
OS :	Windows

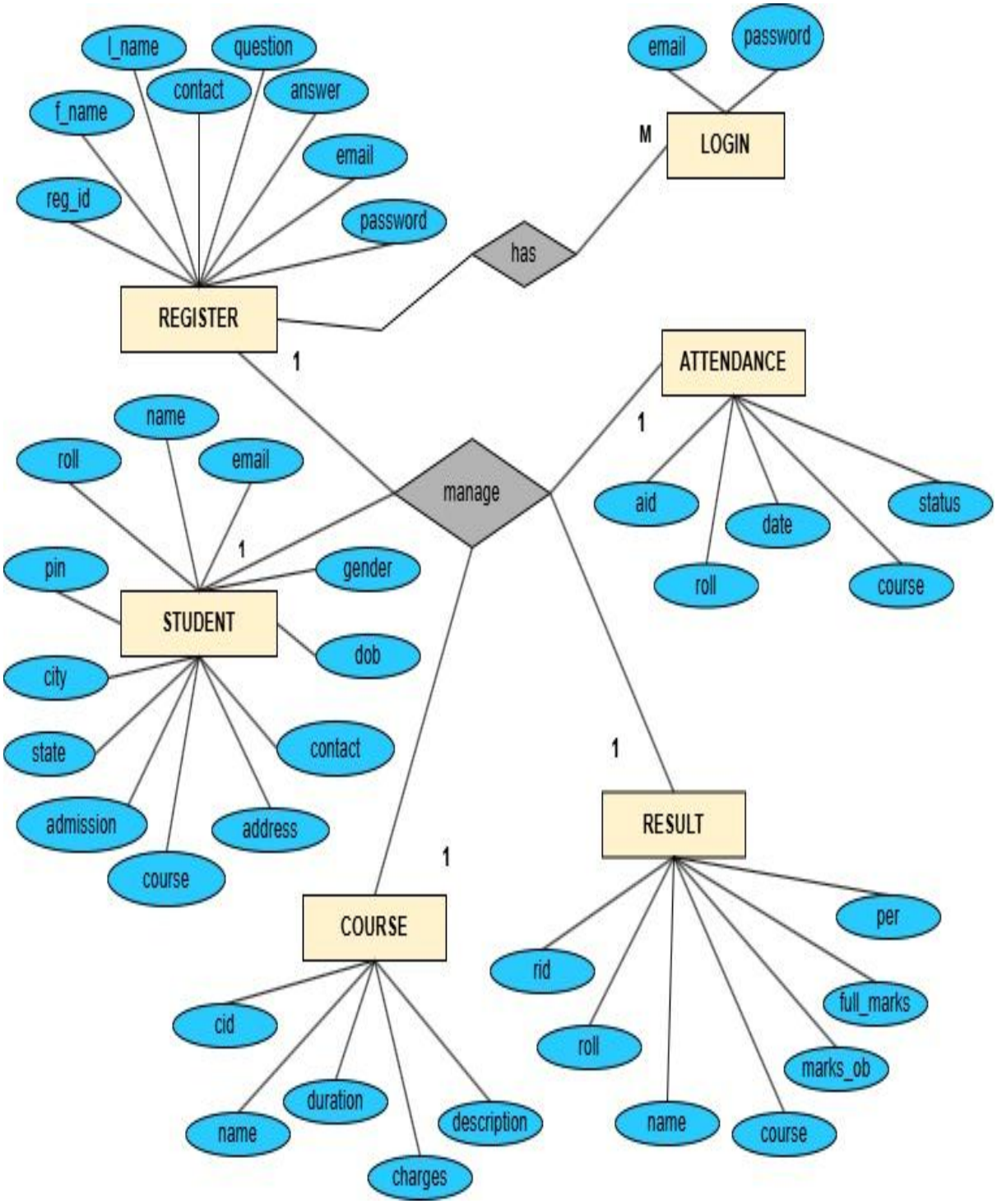
• System Design

1. Block Diagram



2. Database Design

- ## ER Diagram:



- ## Tables:

Manage Register

Table Name	Field Name	Data Type
register	reg_id	INT
	f_name	VARCHAR(50)
	l_name	VARCHAR(50)
	contact	BIGINT
	email	VARCHAR(50)
	question	VARCHAR(50)
	answer	VARCHAR(50)
	password	VARCHAR(50)

Manage Course

Table Name	Field Name	Data Type
course	cid	INT
	name	VARCHAR(50)
	duration	VARCHAR(50)
	charges	INT
	description	VARCHAR(100)

Manage Student

Table Name	Field Name	Data Type
student	roll	INT
	name	VARCHAR(50)
	email	VARCHAR(50)
	gender	VARCHAR(10)
	dob	DATE
	contact	BIGINT
	admission	DATE
	course	VARCHAR(50)
	state	VARCHAR(50)

	city	VARCHAR(50)
	pin	INT
	address	VARCHAR(100)

Manage Result

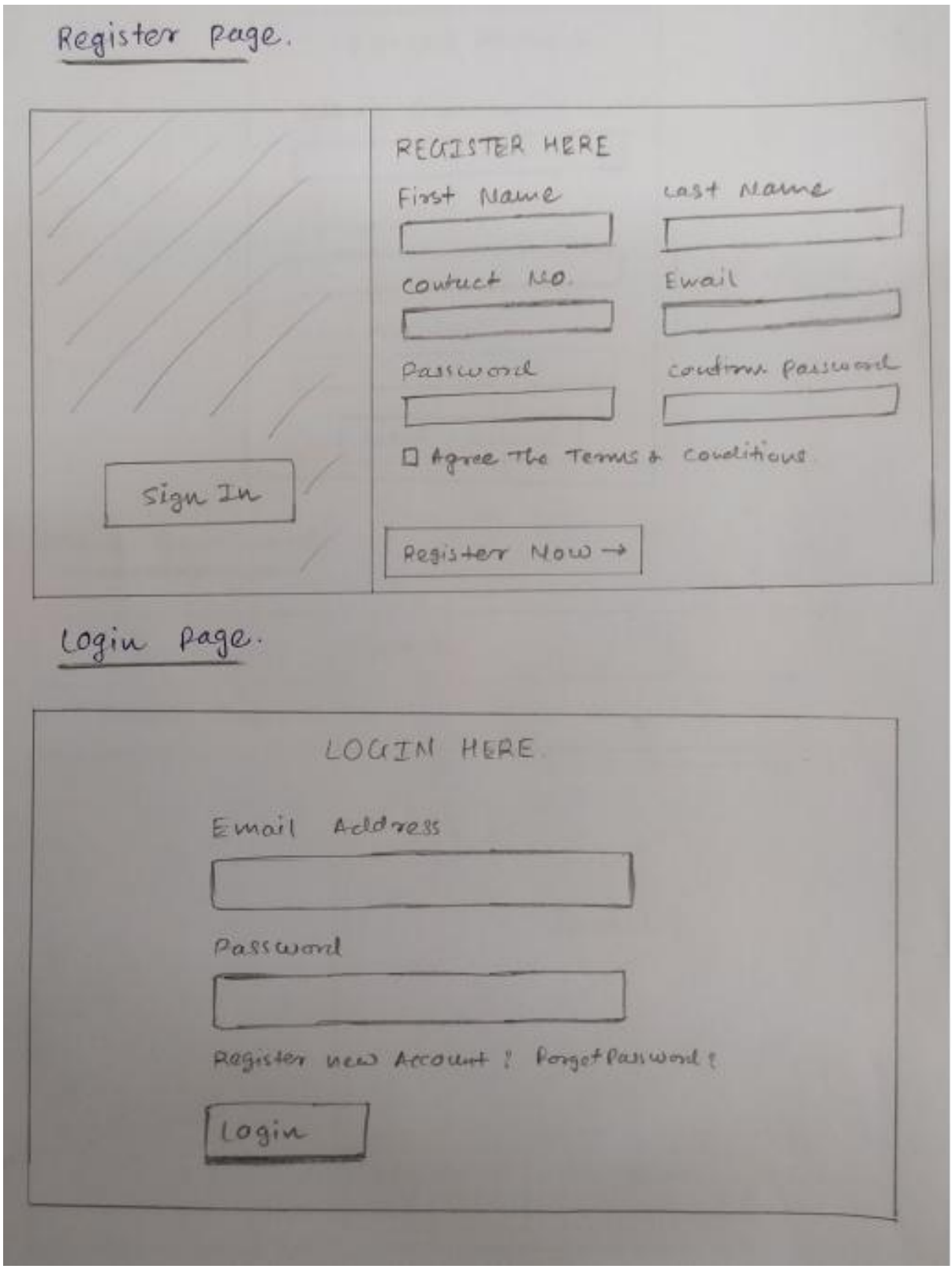
Table Name	Field Name	Data Type
result	rid	INT
	roll	INT
	name	VARCHAR(50)
	course	VARCHAR(50)
	marks_ob	INT
	full_marks	INT
	per	VARCHAR(50)

Manage Attendance

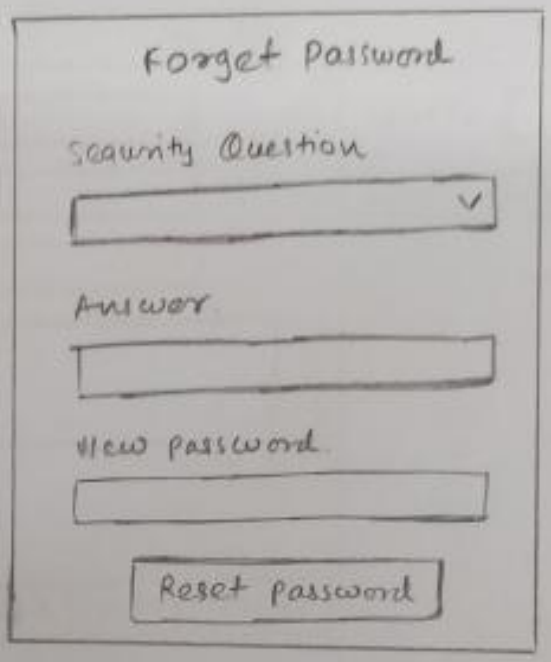
Table Name	Field Name	Data Type
attendance	aid	INT
	roll	INT
	date	DATE
	course	VARCHAR(50)
	status	ENUM('P', 'A')

3. User Interface Design

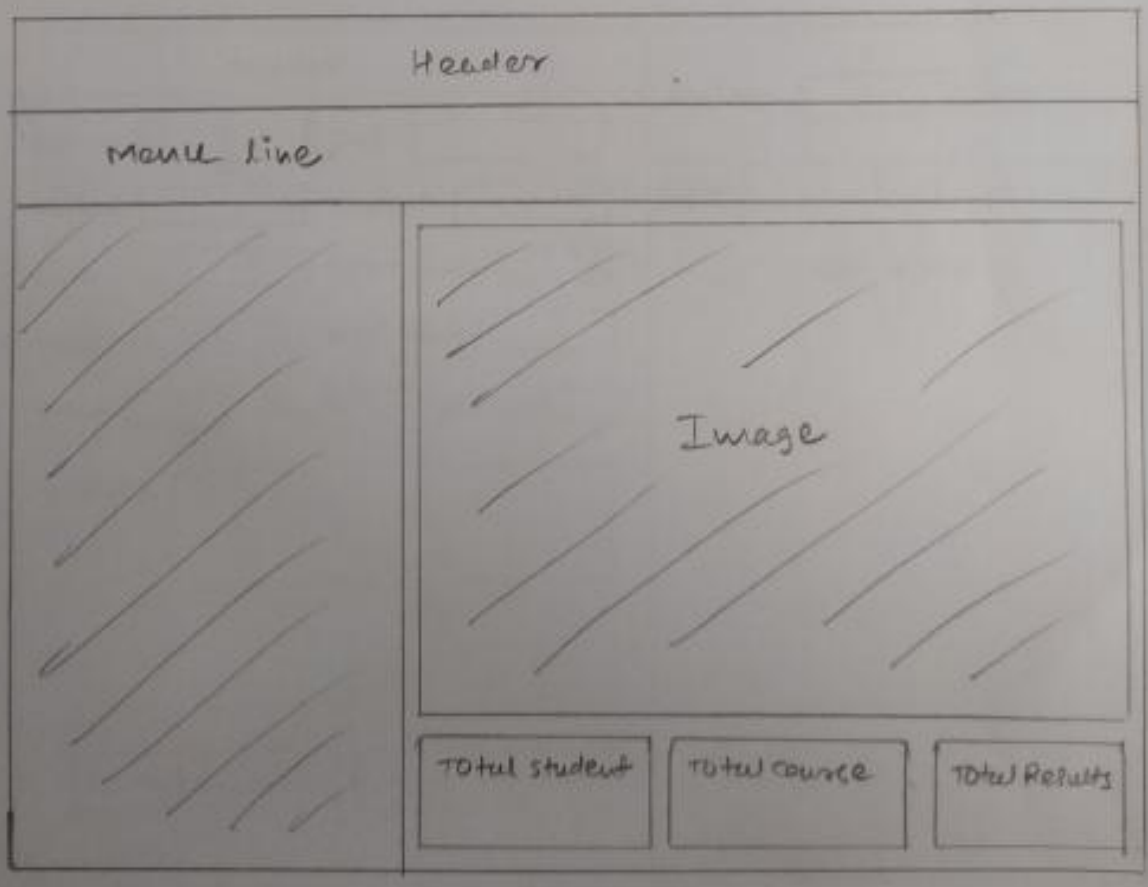
- Wireframes

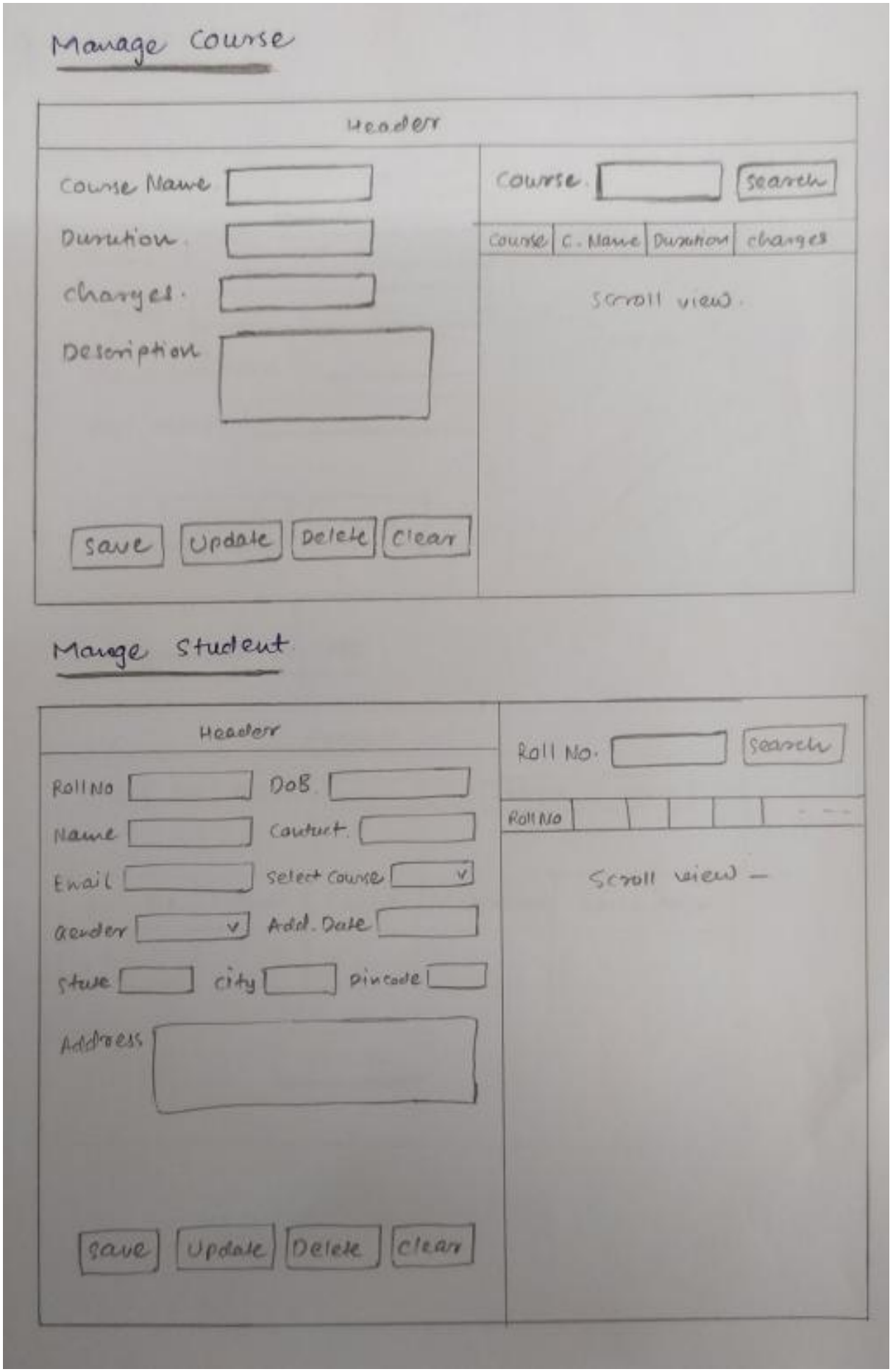


Forget password.

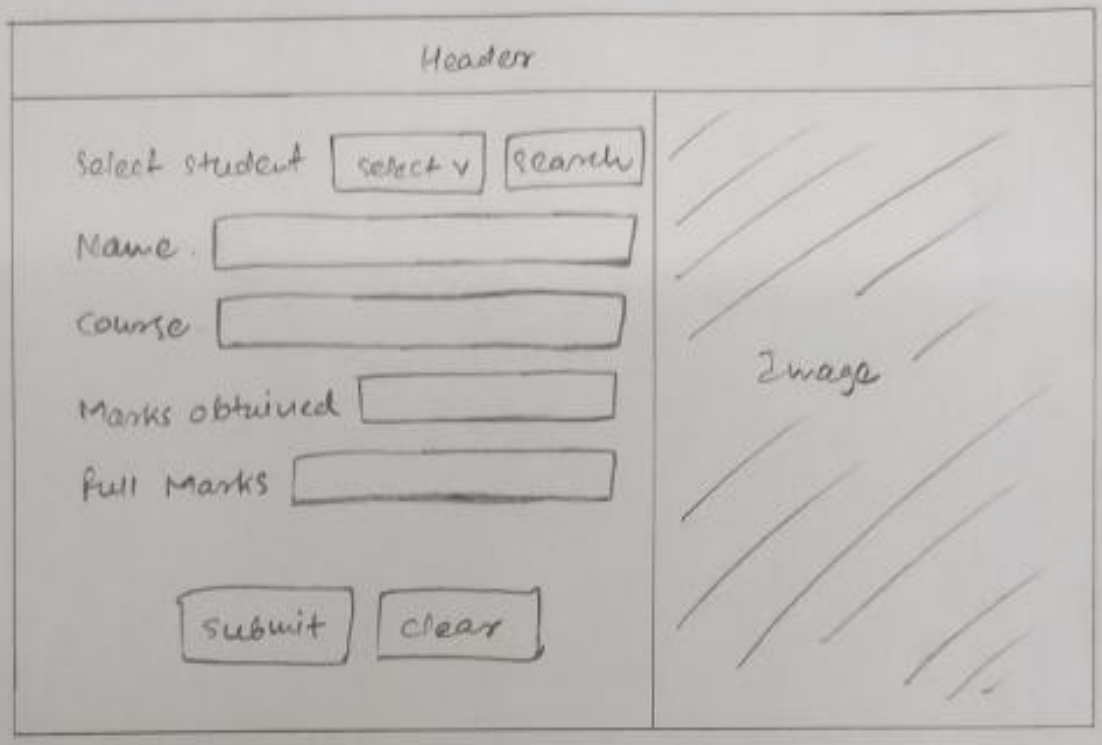


Main Dashboard.

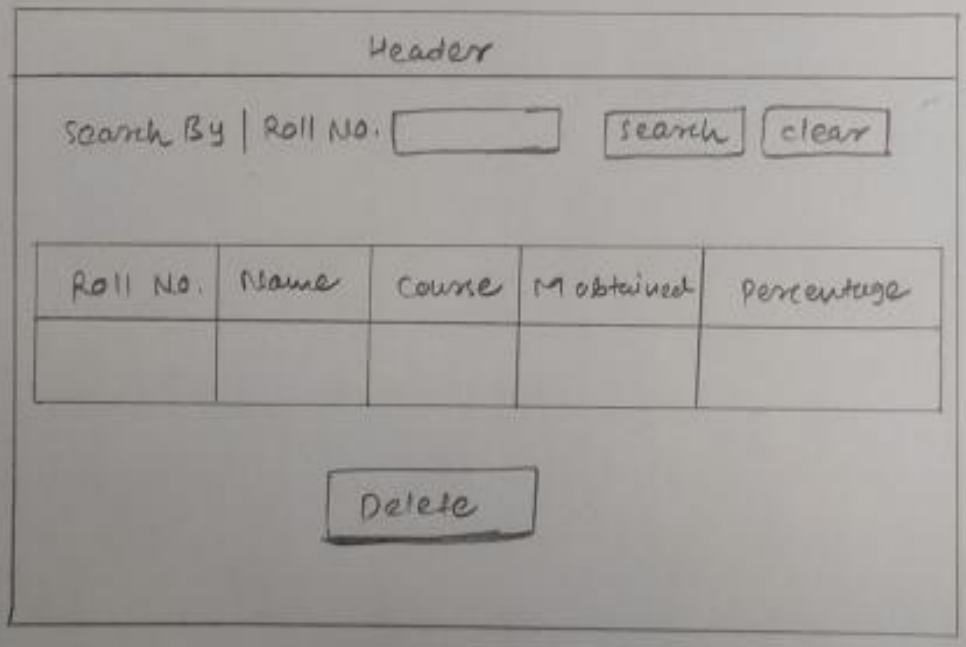



Manage Course
Header
Course Name
Duration.
charges.
Description
Save
Update
Delete
Clear
Course.
Search
Course
C. Name
Duration
charges
Scroll view.
Manage Student
Header
RollNo
DoB.
Name
Contact.
Email
Select Course
Gender
Add. Date
State
city
pincode
Address
Save
Update
Delete
Clear
Roll No.
Search
Roll No
Scroll view —

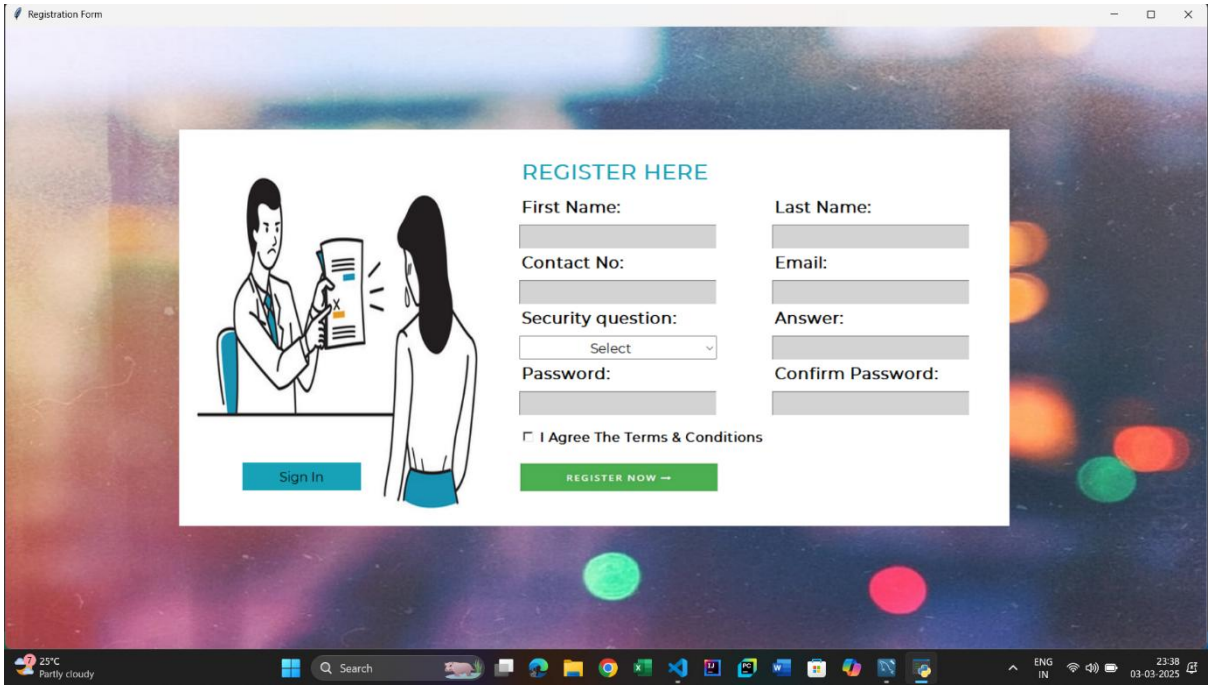
Result Page.



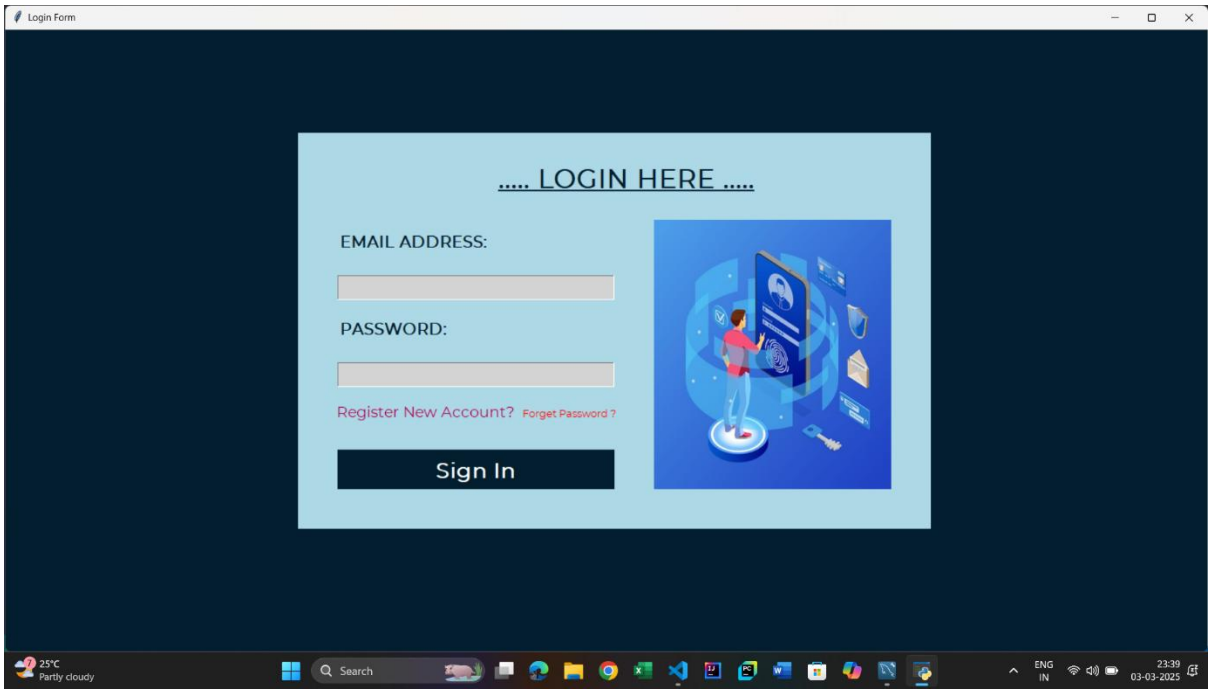
View Student Results.



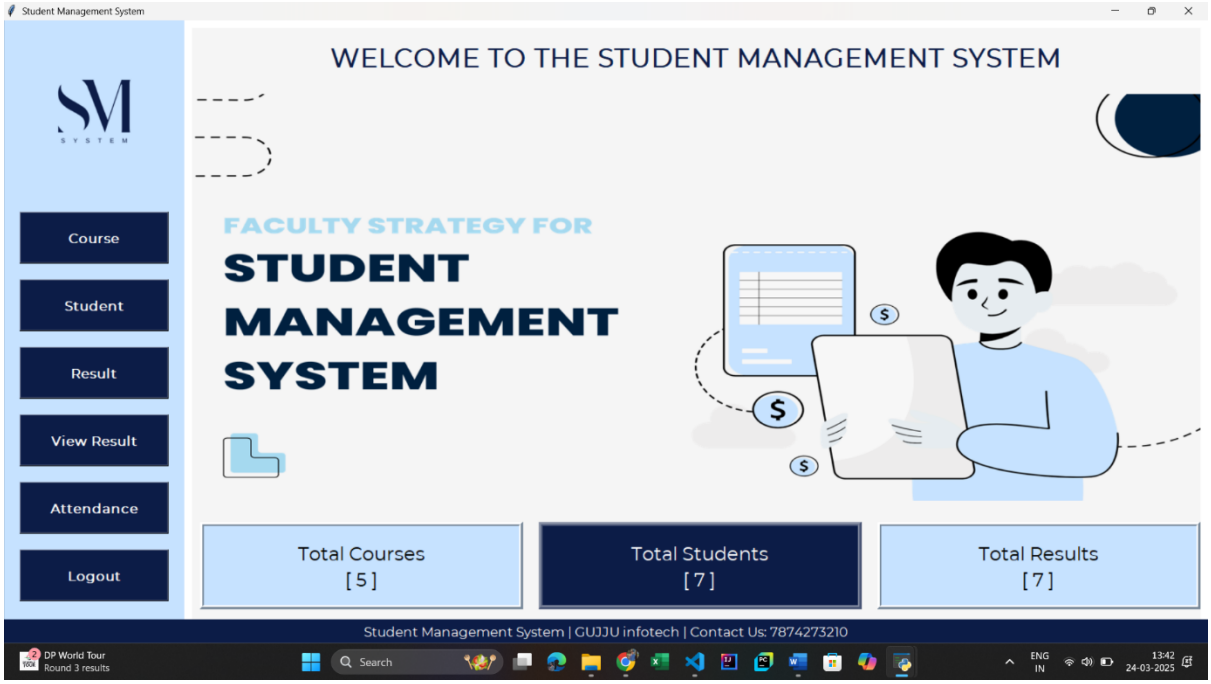
- Screenshots
- Register Form



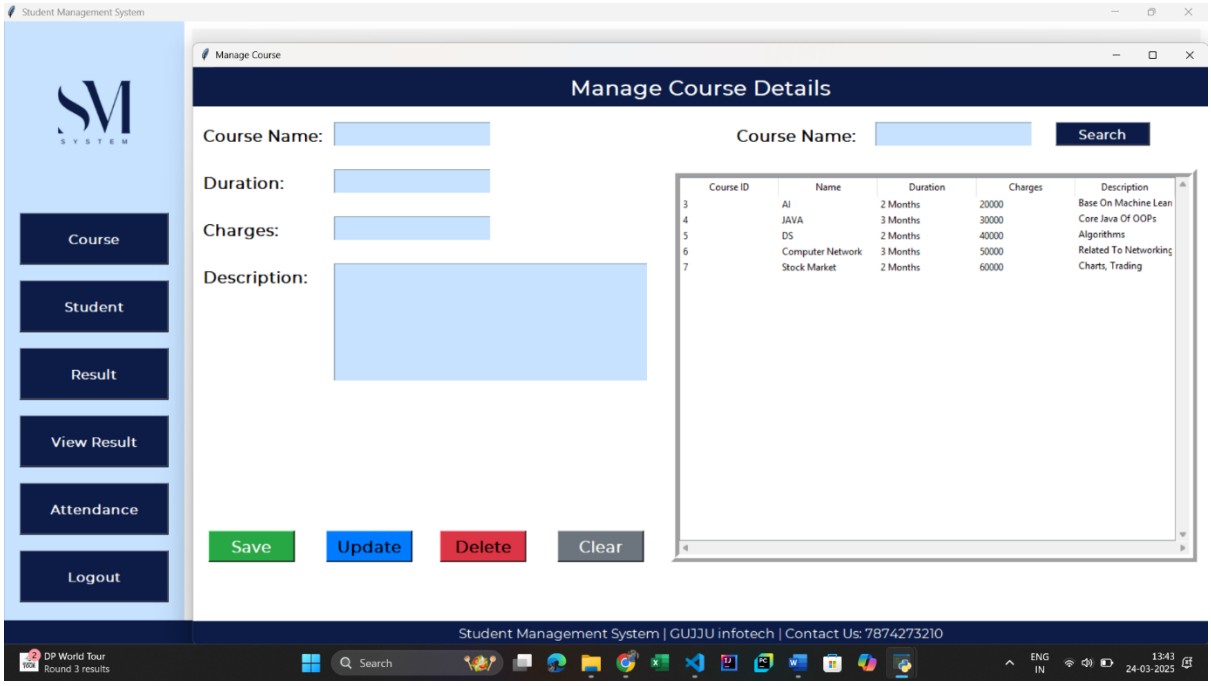
- Login Form



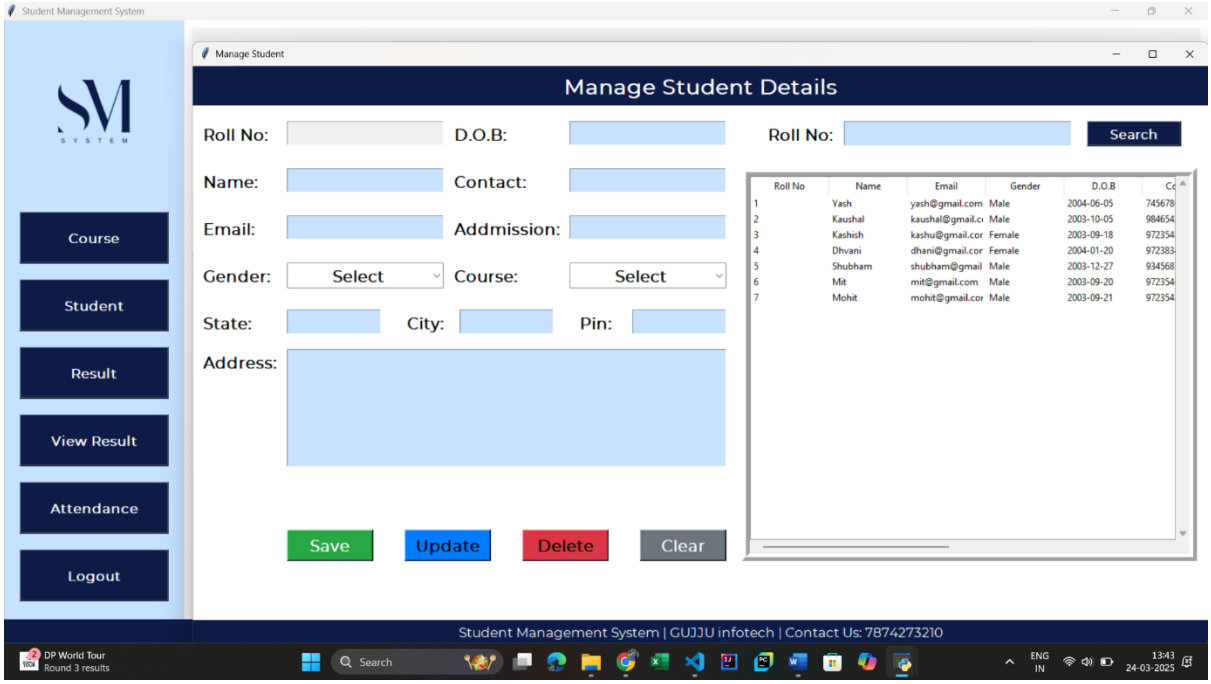
- # Dash-Board Form



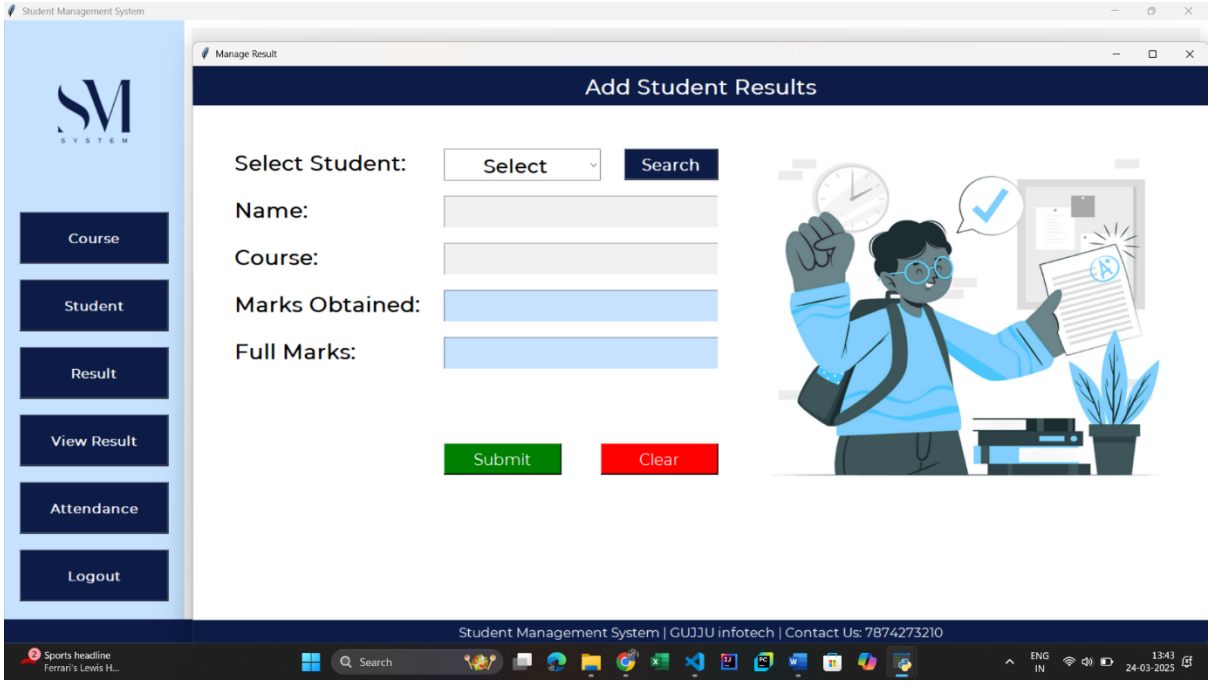
- # Course Form



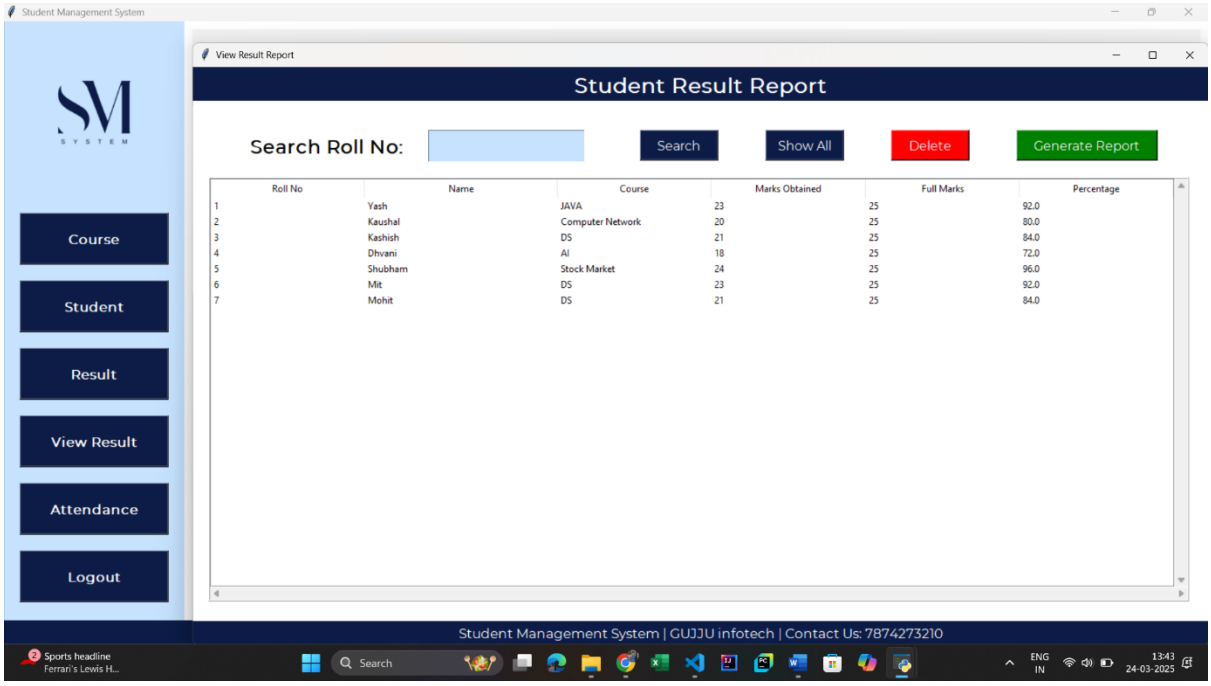
- # Student Form



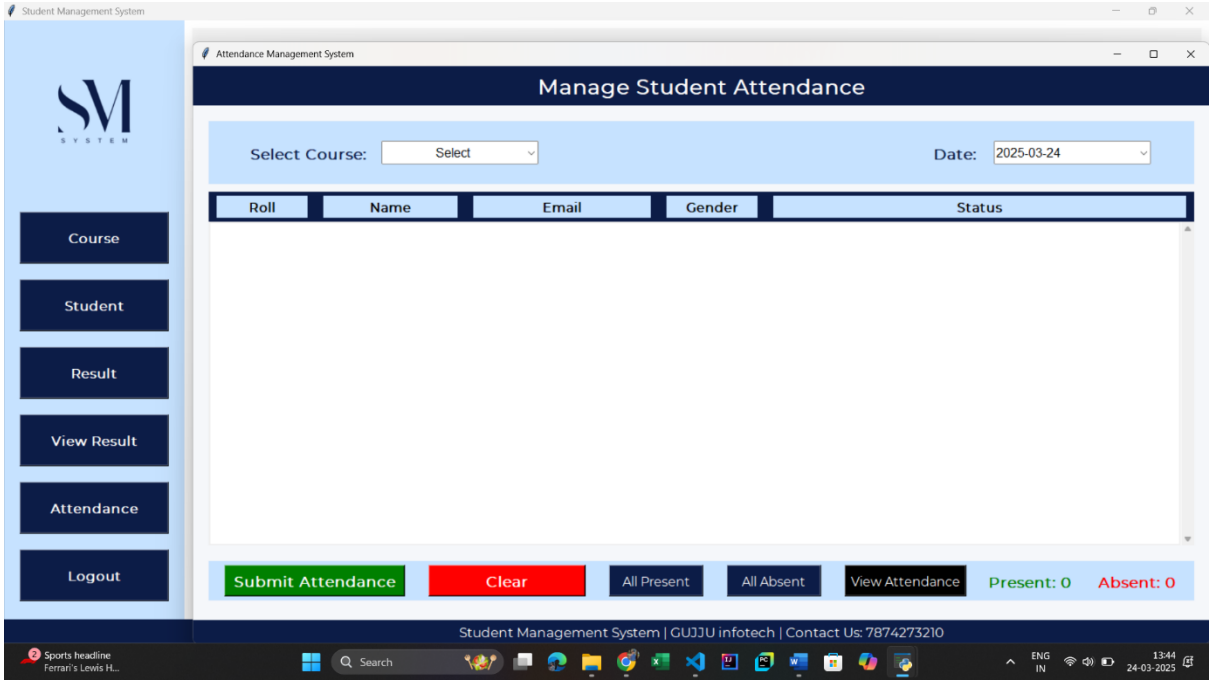
- # Result Form



- # View Result Form



- # Attendance Form



- # Implementation

Database Interaction

```
import mysql.connector
def create_db():
try:
# Connect to MySQL
con = mysql.connector.connect(
host="localhost",    # Change this if MySQL is running on another server
user="root",        # Your MySQL username
password="Ashish@0629",        # Your MySQL password
)
cur = con.cursor()
# Create database if not exists
cur.execute("CREATE DATABASE IF NOT EXISTS sms")
con.commit()
# Connect to the newly created database
con.database = "sms"
# Create course table
cur.execute("""
CREATE TABLE IF NOT EXISTS course(
cid INT AUTO_INCREMENT PRIMARY KEY,
name VARCHAR(255) UNIQUE,  # Ensure course names are unique
duration VARCHAR(100),
charges VARCHAR(50),
description TEXT
)
""")
con.commit()
# Create student table with foreign key
cur.execute("""
CREATE TABLE IF NOT EXISTS student(
roll INT AUTO_INCREMENT PRIMARY KEY,
```

```
name VARCHAR(255),
email VARCHAR(255),
gender VARCHAR(10),
dob DATE,
contact VARCHAR(15),
admission DATE,
course VARCHAR(255),
state VARCHAR(100),
city VARCHAR(100),
pin VARCHAR(10),
address TEXT,
CONSTRAINT fk_course FOREIGN KEY (course) REFERENCES course(name) ON DELETE CASCADE
)
""")
con.commit()
# Create result table with foreign key
cur.execute("""
CREATE TABLE IF NOT EXISTS result(
rid INT AUTO_INCREMENT PRIMARY KEY,
roll INT,
name VARCHAR(255),
course VARCHAR(255),
marks_ob INT,
full_marks INT,
per FLOAT,
CONSTRAINT fk_student FOREIGN KEY (roll) REFERENCES student(roll) ON DELETE CASCADE
)
""")
con.commit()
# Create register table
cur.execute("""
CREATE TABLE IF NOT EXISTS register (
```

```
reg_id INT AUTO_INCREMENT PRIMARY KEY,
f_name VARCHAR(255) NOT NULL,
l_name VARCHAR(255) NOT NULL,
contact VARCHAR(15),
email VARCHAR(255) UNIQUE NOT NULL,
question VARCHAR(255),
answer TEXT,
password VARCHAR(255) NOT NULL  -- Ensure password is always provided
)
""")
con.commit()
# Create attendance table with foreign key to course and student
cur.execute("""
CREATE TABLE IF NOT EXISTS attendance (
aid INT AUTO_INCREMENT PRIMARY KEY,
roll INT,
date DATE,
course INT,
status ENUM('P', 'A'),
CONSTRAINT fk_attendance_student FOREIGN KEY (roll) REFERENCES student(roll) ON DELETE CASCADE,
CONSTRAINT fk_attendance_course FOREIGN KEY (course) REFERENCES course(cid) ON DELETE CASCADE,
CONSTRAINT unique_attendance UNIQUE (roll, date, course)
)
""")
con.commit()
print("Database and Tables Created Successfully!")
con.close()
except mysql.connector.Error as err:
print(f"Error: {err}")
# Run the function to create the database and tables
create_db()
```

User Interface Development

1. Setting Up the Main Dash-Board Window

```
from tkinter import *
from PIL import Image, ImageTk
from course import CourseClass
from student import studentClass
from result import resultClass
from report import ReportClass
from attendance import AttendanceClass
from tkinter import messagebox
import os
import mysql.connector
class SMS:
    def __init__(self, root):
        self.root = root
        self.root.title("Student Management System")
        self.root.geometry("1520x785+0+0")
        self.root.config(bg="white")
# Run Application
if __name__ == "__main__":
    root = Tk()
    obj = SMS(root)
    print("Dashboard is running...")
    root.mainloop()
```

2. Creating a Register Page

```
# Register Frame
Frame1 = Frame(self.root, bg="white")
Frame1.place(x=600, y=130, width=670, height=500)
title = Label(Frame1, text="REGISTER HERE", font=("montserrat", 20, "bold"),
bg="white", fg="#17A2B8").place(x=50, y=30)
# Form Fields
```

```
f_name = Label(Frame1, text="First Name:", font=("montserrat", 15, "bold"), bg="white", fg="black").place(x=50, y=80)

self.txt_fname = Entry(Frame1, font=("montserrat", 15), bg="lightgray")

self.txt_fname.place(x=50, y=120, width=250)

l_name = Label(Frame1, text="Last Name:", font=("montserrat", 15, "bold"), bg="white", fg="black").place(x=370, y=80)

self.txt_lname = Entry(Frame1, font=("montserrat", 15), bg="lightgray")

self.txt_lname.place(x=370, y=120, width=250)

contact = Label(Frame1, text="Contact No:", font=("montserrat", 15, "bold"), bg="white", fg="black").place(x=50, y=150)

self.txt_contact = Entry(Frame1, font=("montserrat", 15), bg="lightgray")

self.txt_contact.place(x=50, y=190, width=250)

email = Label(Frame1, text="Email:", font=("montserrat", 15, "bold"), bg="white", fg="black").place(x=370, y=150)

self.txt_email = Entry(Frame1, font=("montserrat", 15), bg="lightgray")

self.txt_email.place(x=370, y=190, width=250)

question = Label(Frame1, text="Security question:", font=("montserrat", 15, "bold"), bg="white", fg="black").place(x=50, y=220)

self.cmd_quest = ttk.Combobox(Frame1, font=("montserrat", 13), state='readonly', justify=CENTER)

self.cmd_quest['values'] = ("Select", "Your First Pet Name", "Your Birth Place", "Your Best Friend Name")

self.cmd_quest.place(x=50, y=260, width=250)

self.cmd_quest.current(0)

answer = Label(Frame1, text="Answer:", font=("montserrat", 15, "bold"), bg="white", fg="black").place(x=370, y=220)

self.txt_answer = Entry(Frame1, font=("montserrat", 15), bg="lightgray")

self.txt_answer.place(x=370, y=260, width=250)

password = Label(Frame1, text="Password:", font=("montserrat", 15, "bold"), bg="white", fg="black").place(x=50, y=290)

self.txt_pasword = Entry(Frame1, font=("montserrat", 15), bg="lightgray")

self.txt_pasword.place(x=50, y=330, width=250)

cpassword = Label(Frame1, text="Confirm Password:", font=("montserrat", 15, "bold"), bg="white", fg="black").place(x=370, y=290)

self.txt_cpassword = Entry(Frame1, font=("montserrat", 15), bg="lightgray")

self.txt_cpassword.place(x=370, y=330, width=250)
```

```
self.var_chk = IntVar()

chk = Checkbutton(Frame1, text="I Agree The Terms & Conditions",
variable=self.var_chk, onvalue=1, offvalue=0, bg="white", font=("montserrat", 12,
'bold')).place(x=50, y=370)

self.btn_img = ImageTk.PhotoImage(file="D:/Ashish
khadela/Master/SEM_2/PYTHON/Mini_Project/SMS/Code/img/register.png")

btn_register = Button(Frame1, image=self.btn_img, bd=0, cursor="hand2",
command=self.register_data).place(x=50, y=420)

btn_login = Button(self.root, text="Sign In", font=("montserrat", 12), bd=0,
cursor="hand2", command=self.login_window, bg="#17A2B8", fg="black",
activebackground="#138496", activeforeground="white")

btn_login.place(x=300, y=550, width=150)
```

3. Creating a Login Page

```
login_frame = Frame(self.root, bg="lightblue")

login_frame.place(x=370, y=130, width=800, height=500)

title = Label(login_frame, text="..... LOGIN HERE .....", font=("montserrat", 25, "bold",
"underline"),

bg="lightblue", fg="#021e2f").place(x=250, y=30)

# Labels & Entry Fields

Label(login_frame, text="EMAIL ADDRESS:", font=("montserrat", 15, "bold"),
bg="lightblue", fg="#021e2f").place(x=50, y=120)

self.txt_email = Entry(login_frame, font=("montserrat", 15), bg="lightgray")

self.txt_email.place(x=50, y=180, width=350)

Label(login_frame, text="PASSWORD:", font=("montserrat", 15, "bold"),
bg="lightblue", fg="#021e2f").place(x=50, y=230)

self.txt_password = Entry(login_frame, font=("montserrat", 15), bg="lightgray",
show="*")

self.txt_password.place(x=50, y=290, width=350)

btn_reg = Button(login_frame, cursor="hand2", command=self.register_window,
text="Register New Account?", font=("montserrat", 14), bg="lightblue", bd=0,
fg="#B00857").place(x=42, y=330)

btn_forget = Button(login_frame, cursor="hand2", command=self.forget_password,
text="Forget Password ?", font=("montserrat", 10), bg="lightblue", bd=0,
fg="red").place(x=280, y=340)

btn_login = Button(login_frame, text="Sign In", font=("montserrat", 20, "bold"), bd=0,
cursor="hand2", command=self.login, bg="#021e2f", fg="white",
activebackground="black", activeforeground="white").place(x=50, y=400, width=350,
height=50)
```

4. Creating a Course Page

```
# Title

title = Label(self.root, text="Manage Course Details", padx=10, compound=LEFT, font=("montserrat", 20, "bold"), bg="#0C1C47", fg="white")

title.place(x=0, y=0, relwidth=1, height=50)

# Widgets

lbl_courseName = Label(self.root, text="Course Name:", font=("montserrat", 15, 'bold'), bg="white").place(x=10, y=70)

lbl_duration = Label(self.root, text="Duration:", font=("montserrat", 15, 'bold'), bg="white").place(x=10, y=130)

lbl_charges = Label(self.root, text="Charges:", font=("montserrat", 15, 'bold'), bg="white").place(x=10, y=190)

lbl_description = Label(self.root, text="Description:", font=("montserrat", 15, 'bold'), bg="white").place(x=10, y=250)

# Entry Fields

self.txt_courseName = Entry(self.root, textvariable=self.var_course, font=("montserrat", 15, 'bold'), bg="#C6E2FF")

self.txt_courseName.place(x=180, y=70, width=200)

txt_duration = Entry(self.root, textvariable=self.var_duration, font=("montserrat", 15, 'bold'), bg="#C6E2FF").place(x=180, y=130, width=200)

txt_charges = Entry(self.root, textvariable=self.var_charges, font=("montserrat", 15, 'bold'), bg="#C6E2FF").place(x=180, y=190, width=200)

self.txt_description = Text(self.root, font=("montserrat", 15, 'bold'), bg="#C6E2FF")

self.txt_description.place(x=180, y=250, width=400, height=150)

# Buttons

self.btn_add = Button(self.root, text="Save", font=("montserrat", 15, 'bold'), bg="#28A745", fg="white", cursor="hand2", command=self.add)

self.btn_add.place(x=20, y=590, width=110, height=40)

self.btn_update = Button(self.root, text="Update", font=("montserrat", 15, 'bold'), bg="#007BFF", fg="black", cursor="hand2", command=self.update)

self.btn_update.place(x=170, y=590, width=110, height=40)

self.btn_delete = Button(self.root, text="Delete", font=("montserrat", 15, 'bold'), bg="#DC3545", fg="black", cursor="hand2", command=self.delete)

self.btn_delete.place(x=315, y=590, width=110, height=40)

self.btn_clear = Button(self.root, text="Clear", font=("montserrat", 15, 'bold'), bg="#6C757D", fg="white", cursor="hand2", command=self.clear)

self.btn_clear.place(x=465, y=590, width=110, height=40)
```

5. Creating a Student Page

```
# Title

title = Label(self.root, text="Manage Student Details", padx=10, compound=LEFT,
font=("montserrat", 20, "bold"), bg="#0C1C47", fg="white")

title.place(x=0, y=0, relwidth=1, height=50)

self.var_city = StringVar()

self.var_pin = StringVar()

# column1

lbl_roll = Label(self.root, text="Roll No:", font=("montserrat", 15, 'bold'),
bg="white").place(x=10, y=70)

# Roll No Entry (Disabled)

self.txt_roll = Entry(self.root, textvariable=self.var_roll, font=("montserrat", 15, 'bold'),
bg="#ffcbd1", state="readonly")

self.txt_roll.place(x=120, y=70, width=200)

lbl_name = Label(self.root, text="Name:", font=("montserrat", 15, 'bold'),
bg="white").place(x=10, y=130)

lbl_email = Label(self.root, text="Email:", font=("montserrat", 15, 'bold'),
bg="white").place(x=10, y=190)

lbl_gender = Label(self.root, text="Gender:", font=("montserrat", 15, 'bold'),
bg="white").place(x=10, y=250)

lbl_state = Label(self.root, text="State:", font=("montserrat", 15, 'bold'),
bg="white").place(x=10, y=310)

txt_state = Entry(self.root, textvariable=self.var_state, font=("montserrat", 15, 'bold'),
bg="#C6E2FF").place(x=120, y=310, width=120)

lbl_city = Label(self.root, text="City:", font=("montserrat", 15, 'bold'),
bg="white").place(x=270, y=310)

txt_city = Entry(self.root, textvariable=self.var_city, font=("montserrat", 15, 'bold'),
bg="#C6E2FF").place(x=340, y=310, width=120)

lbl_pin = Label(self.root, text="Pin:", font=("montserrat", 15, 'bold'),
bg="white").place(x=490, y=310)

txt_pin = Entry(self.root, textvariable=self.var_pin, font=("montserrat", 15, 'bold'),
bg="#C6E2FF").place(x=560, y=310, width=120)

lbl_address = Label(self.root, text="Address:", font=("montserrat", 15, 'bold'),
bg="white").place(x=10, y=360)

# Entry Fields

txt_name = Entry(self.root, textvariable=self.var_name, font=("montserrat", 15, 'bold'),
bg="#C6E2FF").place(x=120, y=130, width=200)
```

```
txt_email = Entry(self.root, textvariable=self.var_email, font=("montserrat", 15, 'bold'),
bg="#C6E2FF").place(x=120, y=190, width=200)

self.txt_gender = ttk.Combobox(self.root, textvariable=self.var_gender,
values=("Select", "Male", "Female", "Other"), font=("montserrat", 15, 'bold'),
state='readonly', justify=CENTER)

self.txt_gender.place(x=120, y=250, width=200)

self.txt_gender.current(0)

# Widgets

# Column2

lbl_dob = Label(self.root, text="D.O.B:", font=("montserrat", 15, 'bold'),
bg="white").place(x=330, y=70)

lbl_contact = Label(self.root, text="Contact:", font=("montserrat", 15, 'bold'),
bg="white").place(x=330, y=130)

lbl_addmission = Label(self.root, text="Addmission:", font=("montserrat", 15, 'bold'),
bg="white").place(x=330, y=190)

lbl_course = Label(self.root, text="Course:", font=("montserrat", 15, 'bold'),
bg="white").place(x=330, y=250)

# Entry Fields

self.course_list = []

# Fuction_call to update the list


txt_dob = Entry(self.root, textvariable=self.var_dob, font=("montserrat", 15, 'bold'),
bg="#C6E2FF").place(x=480, y=70, width=200)

txt_contact = Entry(self.root, textvariable=self.var_contact, font=("montserrat", 15,
'bold'), bg="#C6E2FF").place(x=480, y=130, width=200)

txt_addmision = Entry(self.root, textvariable=self.var_a_date, font=("montserrat", 15,
'bold'), bg="#C6E2FF").place(x=480, y=190, width=200)

self.txt_course = ttk.Combobox(self.root, textvariable=self.var_course,
values=self.course_list, font=("montserrat", 15, 'bold'), state='readonly',
justify=CENTER)

self.txt_course.place(x=480, y=250, width=200)

self.txt_course.set("Select")

self.fetch_course()

# Text Address

self.txt_address = Text(self.root, font=("montserrat", 15, 'bold'), bg="#C6E2FF")

self.txt_address.place(x=120, y=360, width=560, height=150)

# Buttons
```

```
self.btn_add = Button(self.root, text="Save", font=("montserrat", 15, 'bold'), bg="#28A745", fg="white", cursor="hand2", command=self.add)

self.btn_add.place(x=120, y=590, width=110, height=40)

self.btn_update = Button(self.root, text="Update", font=("montserrat", 15, 'bold'), bg="#007BFF", fg="black", cursor="hand2", command=self.update)

self.btn_update.place(x=270, y=590, width=110, height=40)

self.btn_delete = Button(self.root, text="Delete", font=("montserrat", 15, 'bold'), bg="#DC3545", fg="black", cursor="hand2", command=self.delete)

self.btn_delete.place(x=420, y=590, width=110, height=40)

self.btn_clear = Button(self.root, text="Clear", font=("montserrat", 15, 'bold'), bg="#6C757D", fg="white", cursor="hand2", command=self.clear)

self.btn_clear.place(x=570, y=590, width=110, height=40)
```

6. Creating a Result Page

```
# Title

title = Label(self.root, text="Add Student Results", padx=10, compound=LEFT, font=("montserrat", 20, "bold"), bg="#0C1C47", fg="white")

title.place(x=0, y=0, relwidth=1, height=50)

lbl_select = Label(self.root, text="Select Student:", font=("montserrat", 20, "bold"), bg="white").place(x=50, y=100)

lbl_name = Label(self.root, text="Name:", font=("montserrat", 20, "bold"), bg="white").place(x=50, y=160)

lbl_course = Label(self.root, text="Course:", font=("montserrat", 20, "bold"), bg="white").place(x=50, y=220)

lbl_marks = Label(self.root, text="Marks Obtained:", font=("montserrat", 20, "bold"), bg="white").place(x=50, y=280)

lbl_full_marks = Label(self.root, text="Full Marks:", font=("montserrat", 20, "bold"), bg="white").place(x=50, y=340)

self.txt_student = ttk.Combobox(self.root, textvariable=self.var_roll, values=self.roll_list, font=("montserrat", 19, 'bold'), state='readonly', justify=CENTER)

self.txt_student.place(x=320, y=105, width=200)

self.txt_student.set("Select")

btn_search = Button(self.root, text="Search", font=("montserrat", 15, 'bold'), bg="#0C1C47", fg="white", cursor="hand2", command=self.search).place(x=550, y=105, width=120, height=40)

txt_name = Entry(self.root, textvariable=self.var_name, font=("montserrat", 20, 'bold'), bg="#C6E2FF", state="readonly").place(x=320, y=165, width=350)

txt_course = Entry(self.root, textvariable=self.var_course, font=("montserrat", 20, 'bold'), bg="#C6E2FF", state="readonly").place(x=320, y=225, width=350)
```

```
txt_marks = Entry(self.root, textvariable=self.var_marks, font=("montserrat", 20, 'bold'), bg="#C6E2FF").place(x=320, y=285, width=350)

txt_full_marks = Entry(self.root, textvariable=self.var_full_marks, font=("montserrat", 20, 'bold'), bg="#C6E2FF").place(x=320, y=345, width=350)

# Button

btn_add = Button(self.root, text="Submit", font=("montserrat", 15), bg="green", fg="white", activebackground="green", cursor="hand2", command=self.add).place(x=320, y=480, width=150, height=40)

btn_clear = Button(self.root, text="Clear", font=("montserrat", 15), bg="red", fg="white", activebackground="red", cursor="hand2", command=self.clear).place(x=520, y=480, width=150, height=40)
```

7. Creating a Attendance Page

```
# Title

title = Label(self.root, text="Manage Student Attendance", padx=10, compound=LEFT, font=("montserrat", 20, "bold"), bg="#0C1C47", fg="white")

title.place(x=0, y=0, relwidth=1, height=50)

# Main Frame for Inputs

input_frame = Frame(self.root, bg="#C6E2FF", relief=FLAT, bd=0)

input_frame.place(x=20, y=70, width=1255, height=80)


lbl_select_course = Label(input_frame, text="Select Course:", font=("montserrat", 14, "bold"), bg="#C6E2FF", fg="#0C1C47")

lbl_select_course.place(x=50, y=25)

self.var_course = StringVar()

self.course_list = []

self.txt_course = ttk.Combobox(input_frame, textvariable=self.var_course, values=self.course_list, font=("Helvetica", 12), state='readonly', justify=CENTER)

self.txt_course.place(x=220, y=25, width=200, height=30)

self.txt_course.set("Select")

self.txt_course.bind("<<ComboboxSelected>>", self.update_student_list)

lbl_date = Label(input_frame, text="Date:", font=("montserrat", 14, "bold"), bg="#C6E2FF", fg="#0C1C47")

lbl_date.place(x=500, y=25)

self.date = StringVar()

self.cal = DateEntry(input_frame, textvariable=self.date, date_pattern='yyyy-mm-dd', font=("Helvetica", 12), bg="#FFFFFF", fg="#333333", borderwidth=1)

self.cal.place(x=580, y=25, width=200, height=30)
```

```
self.btn_csv = Button(input_frame, text="Attendance Report", font=("montserrat", 12), bg="#0C1C47", fg="white", activebackground="white", command=self.export_to_csv)

self.btn_csv.place(x=1050, y=25, width=180, height=35)

self.btn_csv.bind("<Enter>", lambda e: self.btn_csv.config(bg="black"))

self.btn_csv.bind("<Leave>", lambda e: self.btn_csv.config(bg="#0C1C47"))

# Frame for Student List with Table-Like Structure

self.student_frame = Frame(self.root, bd=0, relief=FLAT, bg="#FFFFFF")

self.student_frame.place(x=20, y=160, width=1255, height=450)

# Header for Student List

header_frame = Frame(self.student_frame, bg="#0C1C47", bd=0, relief=FLAT)

header_frame.pack(fill=X)

Label(header_frame, text="Roll", font=("montserrat", 12, "bold"), bg="#C6E2FF", fg="black", width=10).pack(side=LEFT, padx=10, pady=5)

Label(header_frame, text="Name", font=("montserrat", 12, "bold"), bg="#C6E2FF", fg="black", width=15).pack(side=LEFT, padx=10, pady=5)

Label(header_frame, text="Email", font=("montserrat", 12, "bold"), bg="#C6E2FF", fg="black", width=20).pack(side=LEFT, padx=10, pady=5)

Label(header_frame, text="Gender", font=("montserrat", 12, "bold"), bg="#C6E2FF", fg="black", width=10).pack(side=LEFT, padx=10, pady=5)
```

Code Snippet

1. Login Authentication

```
def login(self):
    if self.txt_email.get() == "" or self.txt_password.get() == "":
    messagebox.showerror("Error", "All fields are required", parent=self.root)
    else:
        try:
            # Using MySQL Connector
            con = mysql.connector.connect(
                host="localhost",
                user="root",
                password="Ashish@0629",
                database="sms"
            )
            cur = con.cursor(dictionary=True)
            # Check if the email and password exist in the register table
            cur.execute("SELECT * FROM register WHERE email=%s AND
            password=%s", (self.txt_email.get(), self.txt_password.get()))
            row = cur.fetchone()
            if row is None:
            messagebox.showerror("Error", "Invalid EMAIL & PASSWORD",
            parent=self.root)
            else:
            messagebox.showinfo("Success","Welcome!", parent=self.root)
            self.open_dashboard()  # Call function to open dashboard
            con.close()  # Close the connection
        except mysql.connector.Error as es:
            messagebox.showerror("Error", f"Database Error: {str(es)}",
            parent=self.root)
```

2. Register Feature

```
def register_data(self):
    if (self.txt_fname.get() == "" or self.txt_contact.get() == "" or self.txt_email.get() == "" or self.cmd_quest.get() == "Select" or self.txt_answer.get() == "" or self.txt_pasword.get() == "" or self.txt_cpassword.get() == ""):
    messagebox.showerror("Error", "All Fields Are Required", parent=self.root)
    elif self.txt_pasword.get() != self.txt_cpassword.get():
    messagebox.showerror("Error", "Password & Confirm Password Should Be Same", parent=self.root)
    elif self.var_chk.get() == 0:
    messagebox.showerror("Error", "Please Agree to Our Terms & Conditions", parent=self.root)
    else:
        try:
            con = mysql.connector.connect(
            host="localhost",
            user="root",
            password="Ashish@0629",
            database="sms"
            )
            cur = con.cursor()
            cur.execute("SELECT * FROM register WHERE email=%s", (self.txt_email.get(),))
            row = cur.fetchone()
            if row is not None:
            messagebox.showerror("Error", "Email already registered! Try with another email.", parent=self.root)
            else:
            cur.execute("""
            INSERT INTO register (f_name, l_name, contact, email, question, answer, password) VALUES (%s, %s, %s, %s, %s, %s, %s)
            """, (
            self.txt_fname.get(),
            self.txt_lname.get(),
            self.txt_contact.get(),
```

```
                self.txt_email.get(),
                self.cmd_quest.get(),
                self.txt_answer.get(),
                self.txt_pasword.get()
                ))
                con.commit()
                messagebox.showinfo("Success", "Registration Successful!", parent=self.root)
                self.clear()
                self.login_window()
                cur.close()
                con.close()
            except mysql.connector.Error as err:
                messagebox.showerror("Error", f"Error due to: {str(err)}", parent=self.root)
```

3. Forget Password Feature

```
def forget_password(self):
    if self.txt_email.get() == "":
    messagebox.showerror("Error", "Please enter the email address to reset your password", parent=self.root)
    else:
        try:
            # Using MySQL Connector
            con = mysql.connector.connect(
            host="localhost",
            user="root",
            password="Ashish@0629",
            database="sms"
            )
            cur = con.cursor(dictionary=True)
            # Check if the email exists in the register table
            cur.execute("SELECT * FROM register WHERE email=%s", (self.txt_email.get(),))
            row = cur.fetchone()
```

```
                if row is None:
                messagebox.showerror("Error", "Please enter the valid email address to reset your password", parent=self.root)
                else:
                con.close()  # Close the connection
        except mysql.connector.Error as es:
                messagebox.showerror("Error", f"Database Error: {str(es)}", parent=self.root)
```

4. ADD, UPDATE, DELETE, SEARCH, SHOW Feature

```
def add(self):
    con = mysql.connector.connect(host="localhost", user="root", password="Ashish@0629", database="sms")
    cur = con.cursor()
    try:
        if self.var_course.get() == "":
        messagebox.showerror("Error", "Course Name should be required", parent=self.root)
        else:
        cur.execute("SELECT * FROM course WHERE name=%s", (self.var_course.get(),))
        row = cur.fetchone()
        if row is not None:
        messagebox.showerror("Error", "Course name already present", parent=self.root)
        else:
        cur.execute("INSERT INTO course (name, duration, charges, description) VALUES (%s, %s, %s, %s)", (
        self.var_course.get(),
        self.var_duration.get(),
        self.var_charges.get(),
        self.txt_description.get("1.0", END)
        ))
        con.commit()
        messagebox.showinfo("Success", "Course Added Successfully", parent=self.root)
        self.show()
```

```
        except Exception as ex:
            messagebox.showerror("Error", f"Error due to {str(ex)}")
        finally:
            con.close()
```

```
    def update(self):
        con = mysql.connector.connect(host="localhost", user="root", password="Ashish@0629", database="sms")
        cur = con.cursor()
        try:
            if self.var_course.get() == "":
            messagebox.showerror("Error", "Course Name should be required", parent=self.root)
            else:
            cur.execute("SELECT * FROM course WHERE name=%s", (self.var_course.get(),))
            row = cur.fetchone()
            if row is None:
            messagebox.showerror("Error", "Select Course from list", parent=self.root)
            else:
            cur.execute("UPDATE course SET duration=%s, charges=%s, description=%s WHERE name=%s", (
            self.var_duration.get(),
            self.var_charges.get(),
            self.txt_description.get("1.0", END),
            self.var_course.get()
            ))
            con.commit()
            messagebox.showinfo("Success", "Course Updated Successfully", parent=self.root)
            self.show()
        except Exception as ex:
            messagebox.showerror("Error", f"Error due to {str(ex)}")
        finally:
```

```
            con.close()
```

```
def delete(self):
    con = mysql.connector.connect(host="localhost", user="root", password="Ashish@0629", database="sms")
    cur = con.cursor()
    try:
        if self.var_course.get() == "":
        messagebox.showerror("Error", "Course Name should be required", parent=self.root)
        else:
        cur.execute("SELECT * FROM course WHERE name=%s", (self.var_course.get(),))
        row = cur.fetchone()
        if row is None:
        messagebox.showerror("Error", "Please select course from the list first", parent=self.root)
        else:
        op = messagebox.askyesno("Confirm", "Do you really want to delete?", parent=self.root)
        if op:
        cur.execute("DELETE FROM course WHERE name=%s", (self.var_course.get(),))
        con.commit()
        messagebox.showinfo("Delete", "Course Deleted Successfully", parent=self.root)
        self.clear()
    except Exception as ex:
        messagebox.showerror("Error", f"Error due to {str(ex)}")
    finally:
        con.close()
```

```
def search(self):
    con = mysql.connector.connect(host="localhost", user="root", password="Ashish@0629", database="sms")
    cur = con.cursor()
    try:
        cur.execute(f"SELECT * FROM course WHERE name LIKE '%{self.var_search.get()}%'")
        rows = cur.fetchall()
        self.CourseTable.delete(*self.CourseTable.get_children())
        for row in rows:
        self.CourseTable.insert('', END, values=row)
    except Exception as ex:
        messagebox.showerror("Error", f"Error due to {str(ex)}")
    finally:
        con.close()
```

```
def show(self):
    con = mysql.connector.connect(host="localhost", user="root", password="Ashish@0629", database="sms")
    cur = con.cursor()
    try:
        cur.execute("SELECT * FROM course")
        rows = cur.fetchall()
        self.CourseTable.delete(*self.CourseTable.get_children())
        for row in rows:
        self.CourseTable.insert('', END, values=row)
    except Exception as ex:
        messagebox.showerror("Error", f"Error due to {str(ex)}")
    finally:
        con.close()
```

• Testing and Results

Testing

- **Unit Testing:** Individual functions tested.
- **Integration Testing:** Verified seamless database interaction.
- **System Testing:** Complete workflow validated.

Results

- System successfully stores and retrieves student data.

• Conclusion

Achievements

- Fully functional Student Management System.
- Implemented CRUD operations with MySQL.

Limitations

- Currently a standalone desktop application.

Skills Gained

- Python GUI development
- Database management with MySQL
- Software design principles

• Future Enhancements

- Convert to a web-based system using Flask/Django.
- Role-based access for users.
- Export results in Excel/PDF format.
- Integration with an attendance tracking system.

• References

- Python Official Documentation: https://docs.python.org/3/
- MySQL Documentation: https://dev.mysql.com/doc/
- Tkinter Documentation: https://docs.python.org/3/library/tkinter.html

---