Smart Attendance Management System

The project submitted to the

SRM University – AP, Andhra Pradesh

for the partial fulfillment of the requirements to award the degree of

Bachelor of Technology

In

Computer Science and Engineering

School of Engineering and Sciences

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Certificate

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This is to certify that the work present in this Project entitled **“Smart Attendance Management System”** has been carried out by **Sai Charan Teja. J, Khyathi Devi. K, Rushita. G** under our supervision. The work is genuine, original, and suitable for submission to the SRM University – AP for the award of Bachelor of Technology in **School of Engineering and Sciences.**

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Acknowledgments

We want to express my profound gratitude to Dr Jatindra Kumar Dash, of the CSE department, and Mr. Shaiju Panchikkil for their contributions to the completion of my project titled Smart Attendance Management System.

We would like to express our special thanks to our mentor Mr. Shaiju Panchikkil for the time and efforts he provided throughout the year. Your useful advice and suggestions were helpful to us during the project's completion. In this aspect, We are eternally grateful to you.

We would like to take this opportunity to express our gratitude to all of our group members. The project would not have been successful without their cooperation and input.

Signature

Sai Charan Teja. J

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Table of Contents

Problem Statement

Manual attendance tracking in educational institutions is inefficient and error-prone. It consumes valuable class time, leads to inaccuracies in record-keeping, and places an unnecessary administrative burden on educators. The need for an automated solution that streamlines attendance management is evident. The Smart Attendance Management System is designed to automate attendance tracking and improve classroom efficiency by using RFID technology. The goal of this project is to create a system that offers precise and efficient attendance recording while reducing manual workload for educators.

Objectives

The main objectives of the Smart Attendance Management System are as follows:

- Automated Attendance Tracking: Implement RFID-based automated attendance tracking to eliminate manual processes and enhance the efficiency of recording attendance.

- Efficiency Improvement: Streamline classroom operations by reducing the administrative workload on educators, allowing them to focus on teaching.

- Data-Driven Decision-Making: Enable educators to make informed decisions with comprehensive attendance reports and trends, ultimately improving the educational experience.

- Real-Time Records: Ensure precise, real-time attendance records that are accessible to educators and administrators for immediate insights.

Abstract

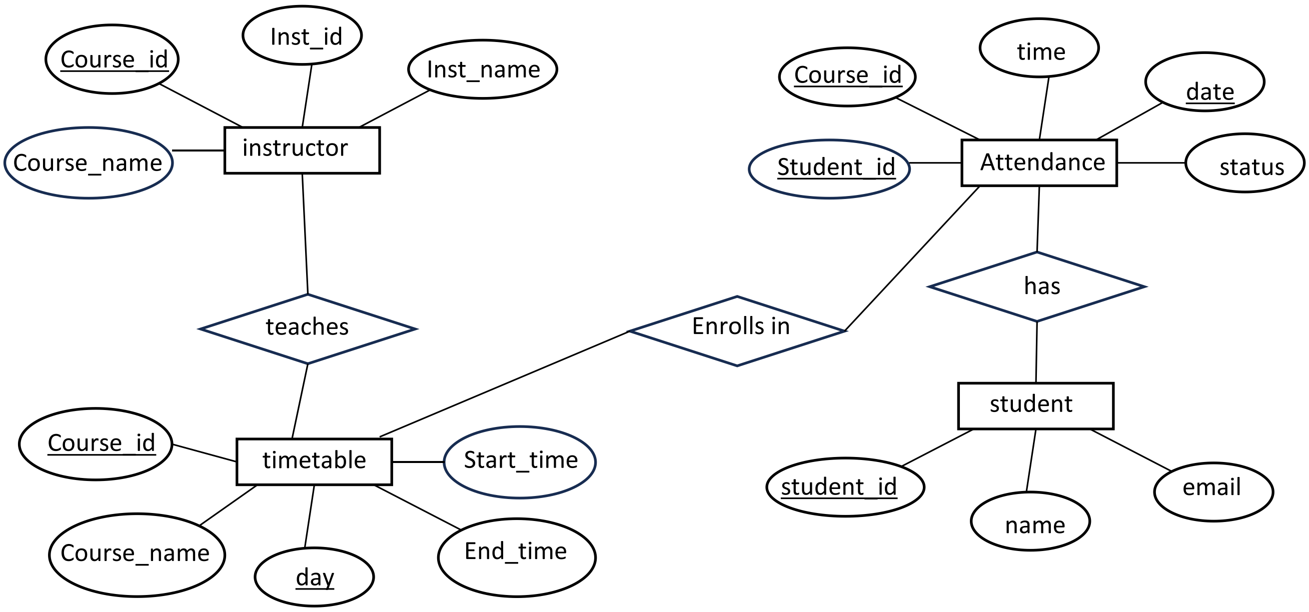
The educational landscape today faces several challenges, including the inefficient and error-prone process of manual attendance tracking. Traditional methods require instructors to devote valuable classroom time to the laborious task of recording attendance, leading to inaccuracies, resource inefficiencies, and a suboptimal educational experience. These challenges become more pronounced in institutions with larger class sizes, multiple courses, and the need for precise attendance records.

The Smart Attendance Management System is a groundbreaking solution designed to address these issues and revolutionize attendance tracking in educational institutions. This project leverages Radio-Frequency Identification (RFID) technology to automate the attendance process, significantly enhancing efficiency and data accuracy. This report provides an overview of the system's design, implementation, and its potential for future enhancements. It covers the front-end and back-end implementation details, as well as the code for recording attendance. Additionally, relevant HTML and CSS components are discussed.

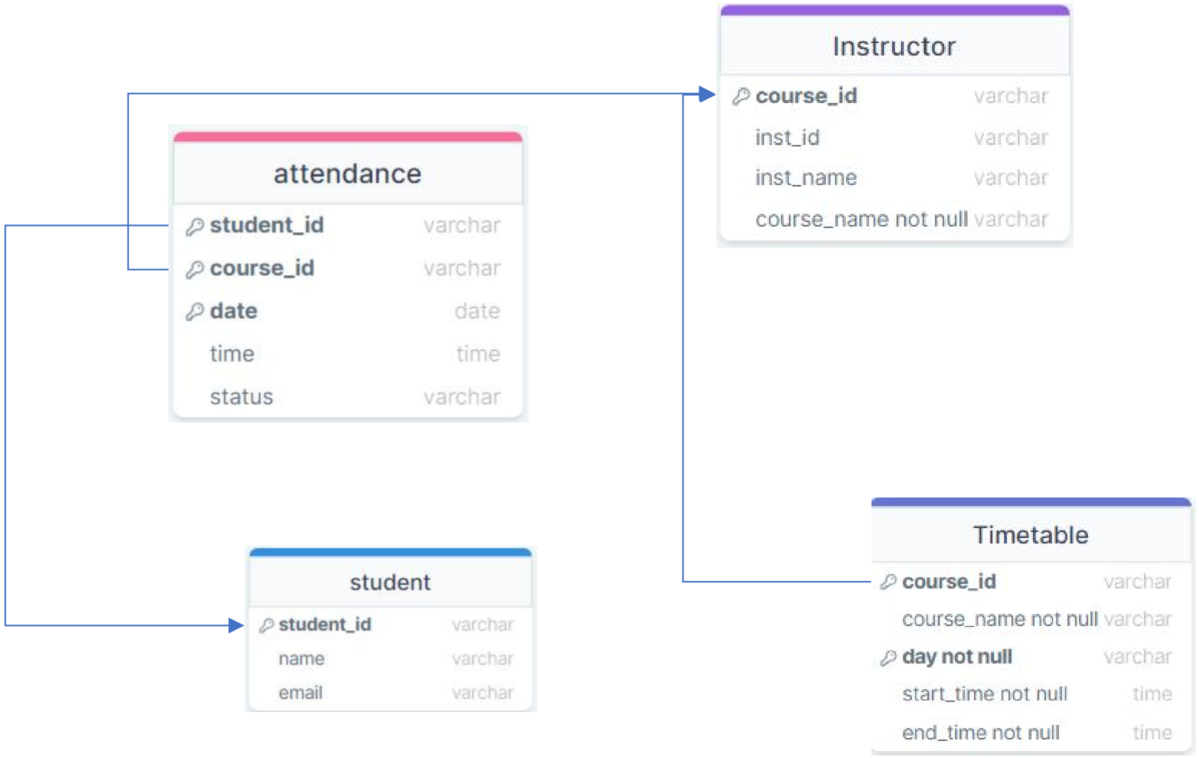
Our System not only simplifies attendance management but also paves the way for a more efficient, error-free, and data-driven educational environment. It promises to enhance the quality of education by removing the burdens associated with manual attendance tracking and providing educators with valuable insights into student attendance patterns.

System Design

ER Diagram



Schema Diagrams



Schema Table

Attendance

Student_id	Course_id	date	time	status

Instructor

Course_id	Inst_id	Inst_name	Course_name

TimeTable

Course_id	Course_name	day	Start_time	End_time

Student

Student_id	name	email

Implementation:

Front end:

User Interface Design:

The front end of the Smart Attendance Management System is meticulously designed to provide a visually appealing and user-friendly interface. HTML is employed to structure the content, CSS for styling, and JavaScript for interactivity. The landing page employs a video background to capture attention, with a dynamically changing navigation bar offering a seamless transition between different sections. The use of Locomotive Scroll enhances the scrolling experience, contributing to the modern and smooth navigation of the application.

Page Structure:

The HTML structure is modular, with distinct pages dedicated to specific functionalities. The landing page (index.html) introduces the system, while subsequent pages delve into details such as RFID technology, system options, and quick links. The pages are styled consistently using CSS, ensuring a cohesive and professional appearance throughout the application.

External Libraries:

To augment the visual elements, Remixicon and Locomotive Scroll external libraries are integrated. Remixicon provides a set of expressive icons, enhancing the overall design. Locomotive Scroll, a smooth-scrolling library, ensures a fluid and engaging user experience. These libraries contribute to the overall aesthetic appeal and functionality of the front end.

Back end:

Flask Integration:

The back-end functionality is seamlessly integrated with the front end using Flask, a micro web framework for Python. Flask handles routing and communication between the client-side and server-side components. Through Flask, the Python scripts interact with the web interface, allowing for dynamic updates and real-time data processing.

Database Interaction:

The back-end functionality revolves around Python and MySQL to manage the storage and retrieval of attendance data. The mysql.connector library facilitates the interaction with the MySQL database, handling queries and updates seamlessly. The Python script (record_attendance.py) establishes a connection to the database, ensuring real-time updates of attendance records.

Attendance Logic:

The back-end logic involves determining the current course based on the day and time. This is achieved by querying the timetable in the database. The script continuously listens for incoming data from the RFID module, extracts student IDs, and updates attendance records accordingly. This ensures accurate and up-to-date attendance information.

Error Handling:

Robust error-handling mechanisms are implemented to address potential issues during database interactions or data processing. This includes catching and logging errors to prevent system failures and maintain the reliability and integrity of the attendance data. The script gracefully handles scenarios such as database connection errors, ensuring uninterrupted functionality.

Codes:

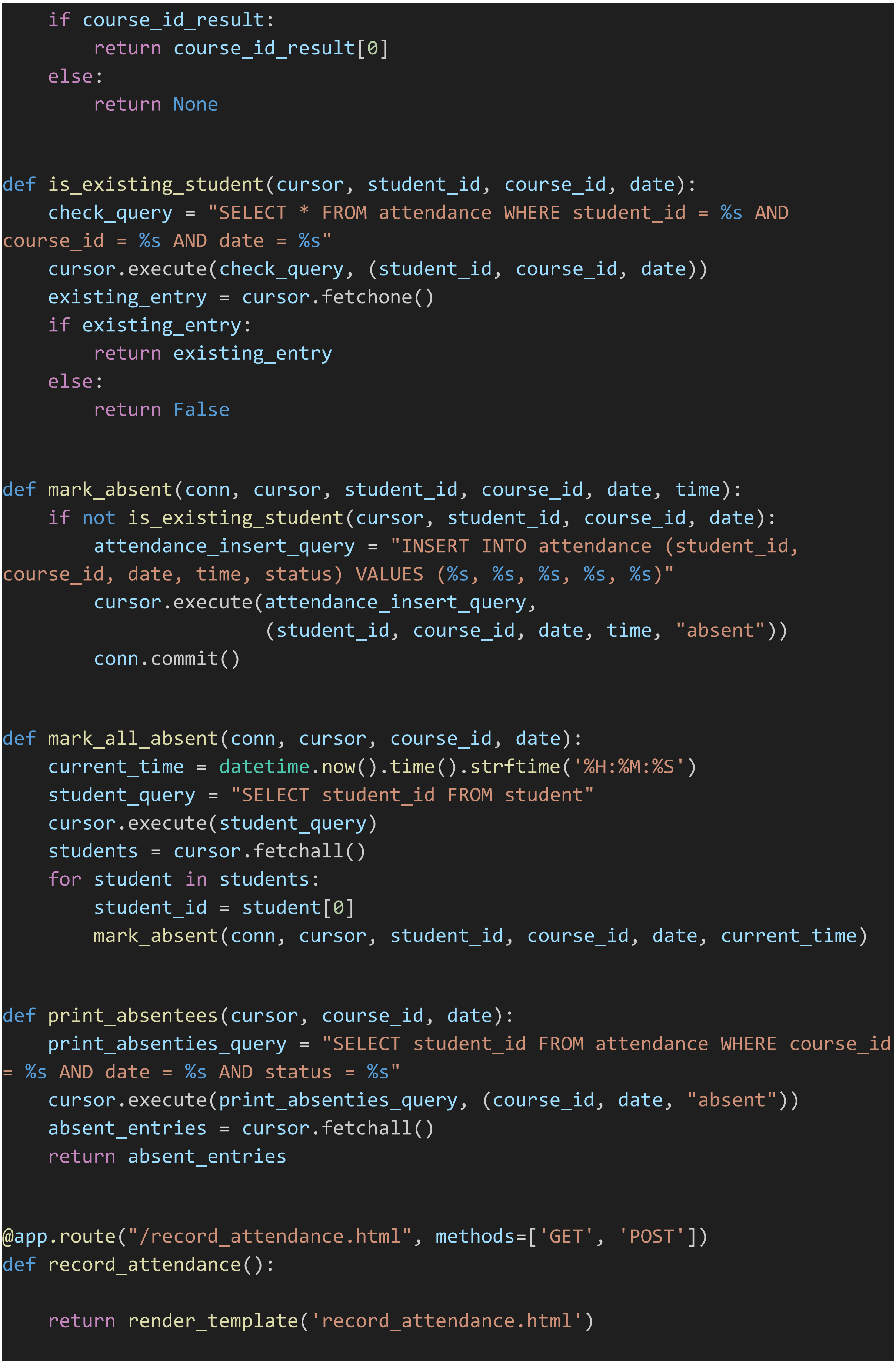
Scanning_ID_Card.ino

```
#include <ESP8266WiFi.h>
#include <WiFiUdp.h>
#include <MFRC522.h>
#include <SPI.h>

#define RST_PIN         D3
#define SS_PIN          D4

MFRC522 mfrc522(SS_PIN, RST_PIN);
MFRC522::MIFARE_Key key;
MFRC522::StatusCode status;

const char* ssid = "Your ssid";
const char* password = "Your Password";
const char* host = " ";  // Change to the IP address of your Python server
unsigned int localPort = 8888;  // Change the port number

WiFiUDP udp;

void setup() {
  Serial.begin(9600);
  SPI.begin();
  udp.begin(localPort);
  mfrc522.PCD_Init();
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED) {
    delay(1000);
    Serial.println("Connecting to WiFi...");
  }
  Serial.println("Connected to WiFi");
  Serial.println(F("Read personal data on a MIFARE PICC:"));
}

void loop() {
  for (byte i = 0; i < 6; i++) key.keyByte[i] = 0xFF;

  byte block;
  byte len;
  if (!mfrc522.PICC_IsNewCardPresent()) {
    return;
  }

  if (!mfrc522.PICC_ReadCardSerial()) {
    return;
  }
  Serial.println(F("Card Detected:"));

  byte buffer1[18];

  block = 1;
  len = 18;

  status = mfrc522.PCD_Authenticate(MFRC522::PICC_CMD_MF_AUTH_KEY_A, 1, &key,
&(mfrc522.uid));
  if (status != MFRC522::STATUS_OK) {
    Serial.print(F("Authentication failed: "));
    Serial.println(mfrc522.GetStatusCodeName(status));
    return;
  }

  status = mfrc522.MIFARE_Read(block, buffer1, &len);
  if (status != MFRC522::STATUS_OK) {
    Serial.print(F("Reading failed: "));
    Serial.println(mfrc522.GetStatusCodeName(status));
    return;
  }
  char studentID[14];
  for (uint8_t i = 0; i < 13; i++) {
    studentID[i] = (char)buffer1[i];
  }
  for (uint8_t i = 0; i < 13; i++) {
    Serial.print(studentID[i]);
  }
  Serial.println();
  studentID[14] = '\0';
  udp.beginPacket(host, localPort);
  udp.write(studentID);
  udp.endPacket();
  delay(1000); // Send a message every second
  mfrc522.PICC_HaltA();
  mfrc522.PCD_StopCrypto1();
}
```

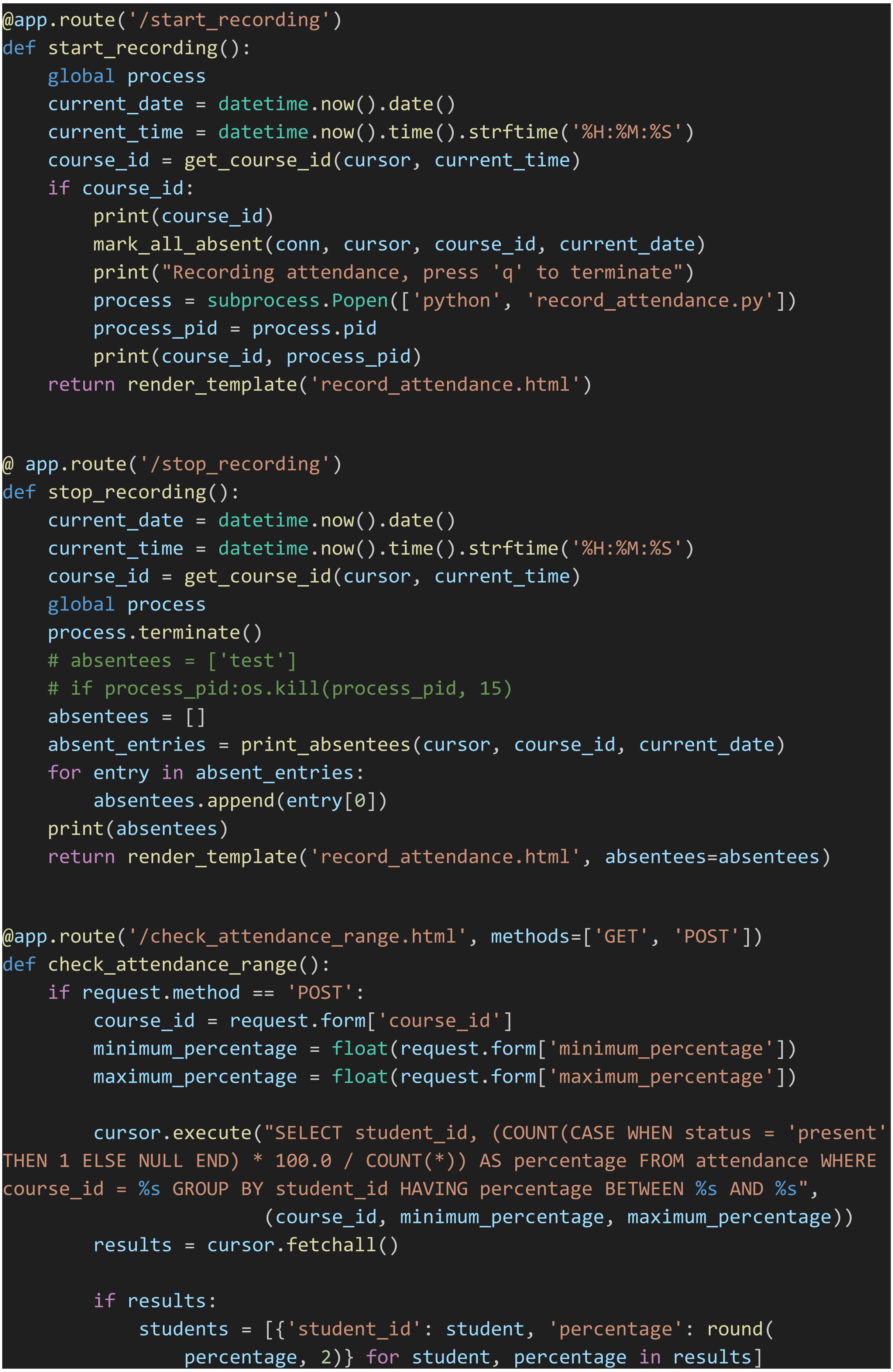
app.py

```python
from flask import Flask, render_template, request, redirect, url_for, flash
import mysql.connector
from datetime import datetime
import smtplib
from email.mime.multipart import MIMEMultipart  # Add this import
from email.mime.text import MIMEText
import openpyxl
import subprocess
import psutil
import pandas as pd
from openpyxl import Workbook
from openpyxl.utils.dataframe import dataframe_to_rows
import os
import matplotlib.pyplot as plt
process_pid = None
process = None


app = Flask(__name__)

# Database configuration
db_config = {
    'host': 'localhost',
    'user': 'username of your database',
    'password': 'password of you database',
    'database': 'name of you database',
}


def connect_to_database():
    try:
        connection = mysql.connector.connect(**db_config)
        cursor = connection.cursor()
        print("Connected to the database")
        return connection, cursor
    except mysql.connector.Error as err:
        print(f"Error: {err}")
        return None, None


conn, cursor = connect_to_database()


@app.route('/')
def index():
    return render_template('index.html')
```

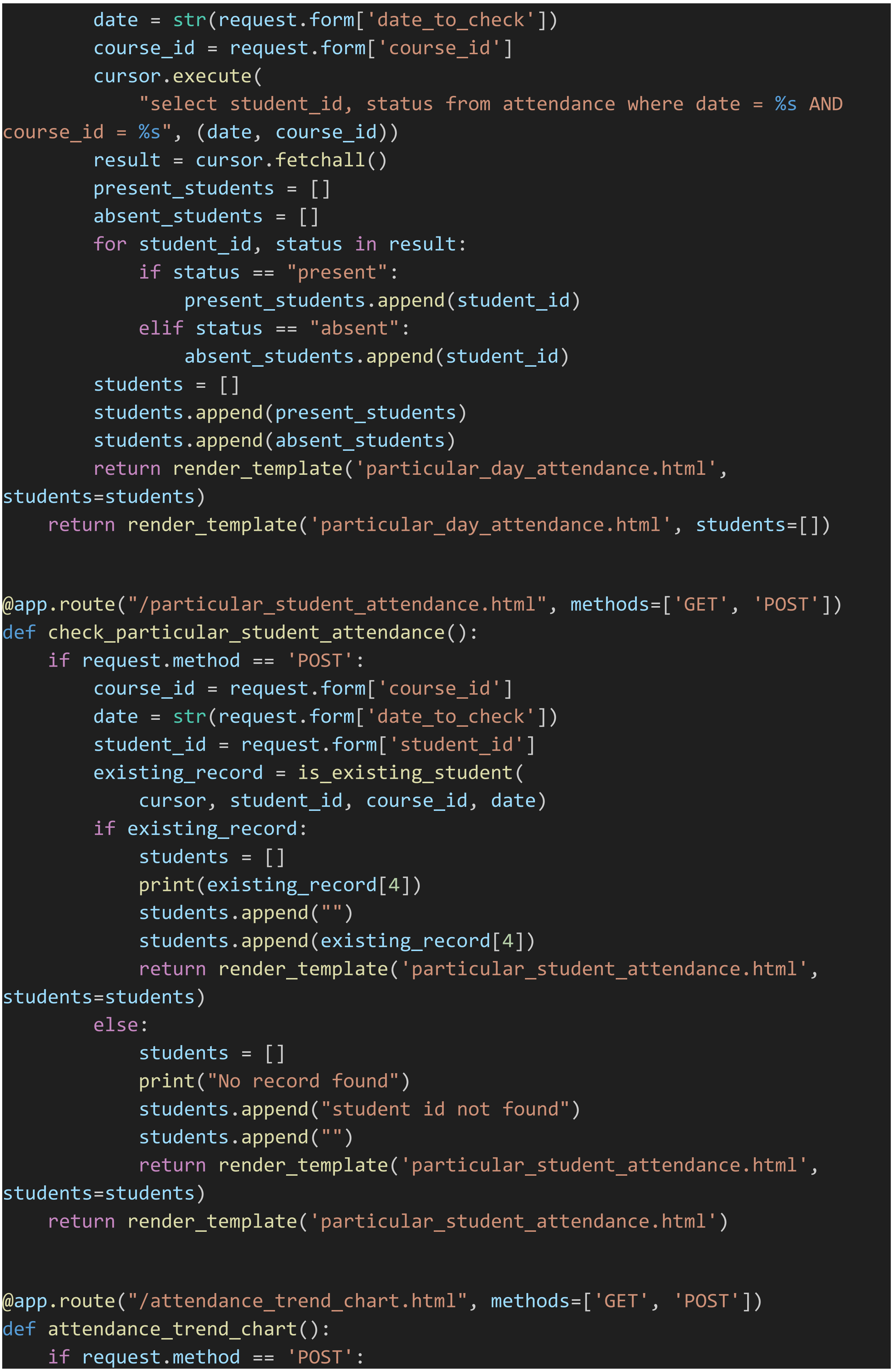
```
def send_email_to_students(course_id, minimum_attendance_percentage):
    cursor.execute("SELECT s.student_id,s.name,s.email, (COUNT(CASE WHEN
a.status = 'present' THEN 1 ELSE NULL END) * 100.0 / COUNT(*)) AS percentage
FROM student s join attendance a on s.student_id=a.student_id WHERE
a.course_id = %s GROUP BY student_id HAVING percentage<%s", (course_id,
minimum_attendance_percentage))
    results = cursor.fetchall()

    for student_id, student_name, email, attendance_percentage in results:
        smtp_server = 'smtp.gmail.com'
        smtp_port = 587
        sender_email = ‘************’
        sender_password = '*********'

        msg = MIMEMultipart()
        msg['From'] = sender_email
        msg['To'] = email
        msg['Subject'] = 'Attendance Warning'
        body = f"Dear {student_name},\n\nYour attendance percentage for the
course {course_id}is below the specified percentage.\n\n Please ensure to
attend the upcoming classes to improve your attendance percentage."
        msg.attach(MIMEText(body, 'plain'))

        with smtplib.SMTP(smtp_server, smtp_port, timeout=40) as server:
            server.starttls()
            server.login(sender_email, sender_password)
            server.sendmail(sender_email, email, msg.as_string())
        print(f"Email sent to {email}")


@app.route("/send_mail.html", methods=['GET', 'POST'])
def send_mail():
    if request.method == 'POST':
        course_id = request.form['course_id']
        minimum_attendance_percentage = float(
            request.form['minimum_attendance_percentage'])
        send_email_to_students(course_id, minimum_attendance_percentage)
        status = "Mail sent"
        return render_template('send_mail.html', status=status)

    return render_template('send_mail.html', status="")


def get_course_id(cursor, time):
    day_of_week = datetime.now().strftime('%A')
    fetch_course_id_query = "SELECT course_id FROM timetable WHERE day = %s
AND %s BETWEEN start_time AND end_time"
    cursor.execute(fetch_course_id_query, (day_of_week, time))
    course_id_result = cursor.fetchone()
```



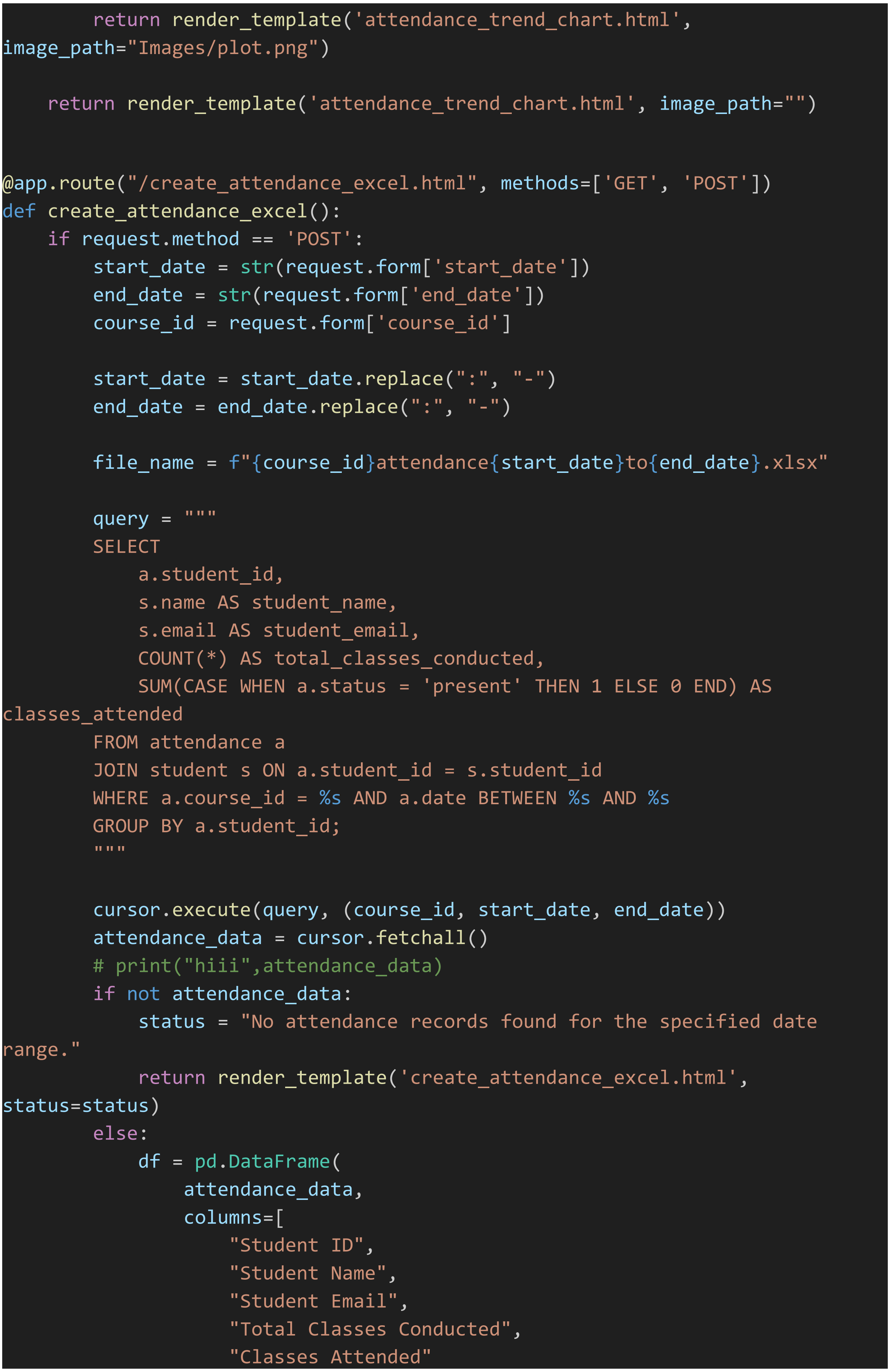
```
    if course_id_result:
        return course_id_result[0]
    else:
        return None


def is_existing_student(cursor, student_id, course_id, date):
    check_query = "SELECT * FROM attendance WHERE student_id = %s AND 
course_id = %s AND date = %s"
    cursor.execute(check_query, (student_id, course_id, date))
    existing_entry = cursor.fetchone()
    if existing_entry:
        return existing_entry
    else:
        return False


def mark_absent(conn, cursor, student_id, course_id, date, time):
    if not is_existing_student(cursor, student_id, course_id, date):
        attendance_insert_query = "INSERT INTO attendance (student_id, 
course_id, date, time, status) VALUES (%s, %s, %s, %s, %s)"
        cursor.execute(attendance_insert_query,
                       (student_id, course_id, date, time, "absent"))
        conn.commit()


def mark_all_absent(conn, cursor, course_id, date):
    current_time = datetime.now().time().strftime('%H:%M:%S')
    student_query = "SELECT student_id FROM student"
    cursor.execute(student_query)
    students = cursor.fetchall()
    for student in students:
        student_id = student[0]
        mark_absent(conn, cursor, student_id, course_id, date, current_time)


def print_absentees(cursor, course_id, date):
    print_absenties_query = "SELECT student_id FROM attendance WHERE course_id 
= %s AND date = %s AND status = %s"
    cursor.execute(print_absenties_query, (course_id, date, "absent"))
    absent_entries = cursor.fetchall()
    return absent_entries


@app.route("/record_attendance.html", methods=['GET', 'POST'])
def record_attendance():

    return render_template('record_attendance.html')
```



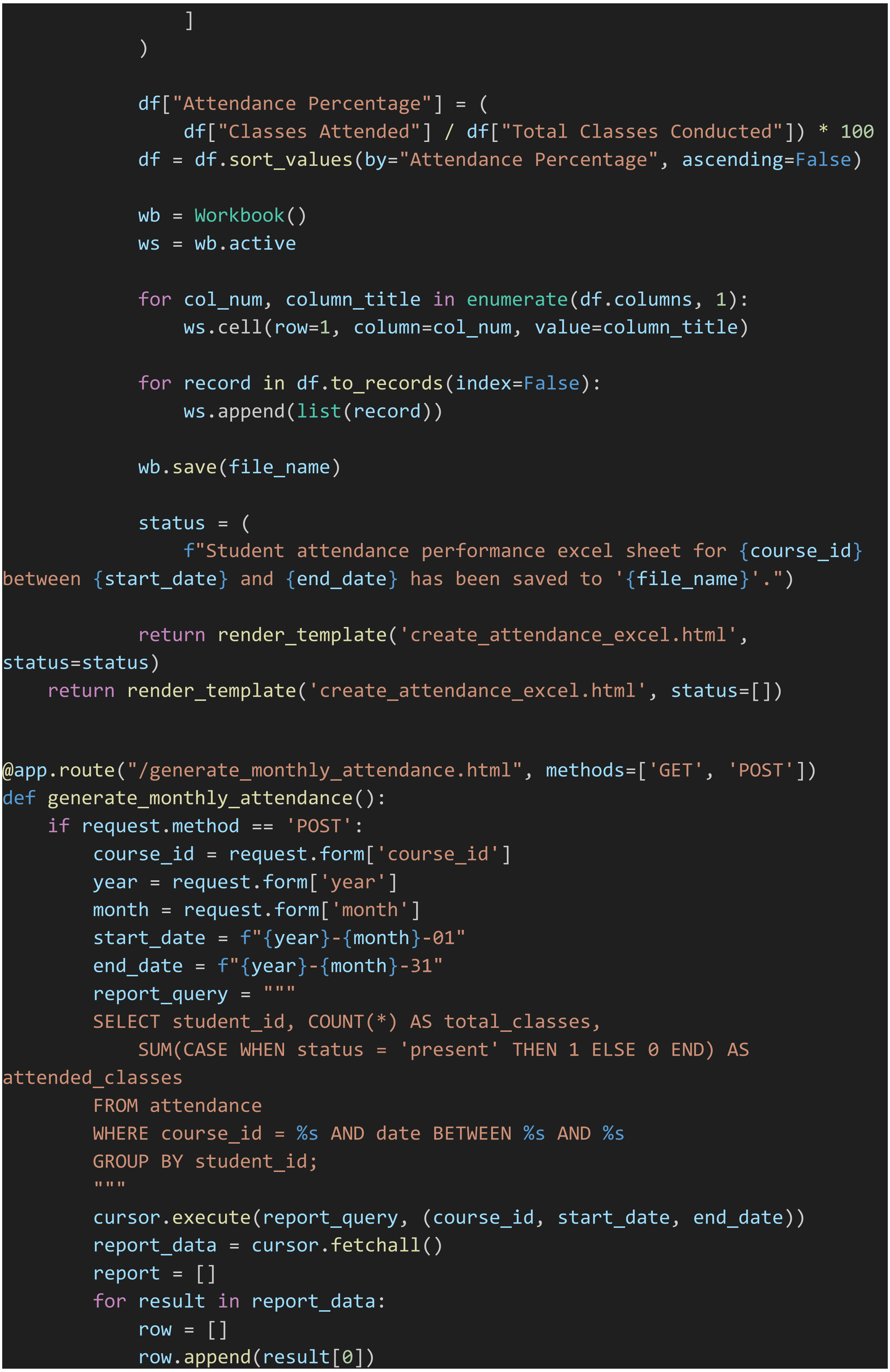
```
@app.route('/start_recording')
def start_recording():
    global process
    current_date = datetime.now().date()
    current_time = datetime.now().time().strftime('%H:%M:%S')
    course_id = get_course_id(cursor, current_time)
    if course_id:
        print(course_id)
        mark_all_absent(conn, cursor, course_id, current_date)
        print("Recording attendance, press 'q' to terminate")
        process = subprocess.Popen(['python', 'record_attendance.py'])
        process_pid = process.pid
        print(course_id, process_pid)
    return render_template('record_attendance.html')


@ app.route('/stop_recording')
def stop_recording():
    current_date = datetime.now().date()
    current_time = datetime.now().time().strftime('%H:%M:%S')
    course_id = get_course_id(cursor, current_time)
    global process
    process.terminate()
    # absentees = ['test']
    # if process_pid:os.kill(process_pid, 15)
    absentees = []
    absent_entries = print_absentees(cursor, course_id, current_date)
    for entry in absent_entries:
        absentees.append(entry[0])
    print(absentees)
    return render_template('record_attendance.html', absentees=absentees)


@app.route('/check_attendance_range.html', methods=['GET', 'POST'])
def check_attendance_range():
    if request.method == 'POST':
        course_id = request.form['course_id']
        minimum_percentage = float(request.form['minimum_percentage'])
        maximum_percentage = float(request.form['maximum_percentage'])

        cursor.execute("SELECT student_id, (COUNT(CASE WHEN status = 'present'
THEN 1 ELSE NULL END) * 100.0 / COUNT(*)) AS percentage FROM attendance WHERE
course_id = %s GROUP BY student_id HAVING percentage BETWEEN %s AND %s",
                       (course_id, minimum_percentage, maximum_percentage))
        results = cursor.fetchall()

        if results:
            students = [{'student_id': student, 'percentage': round(
                percentage, 2)} for student, percentage in results]
        else:
            students = []

        return render_template('check_attendance_range.html',
students=students)

    return render_template('check_attendance_range.html', students=[])


@app.route("/manual_attendance.html", methods=['GET', 'POST'])
def manual_attendance():
    if request.method == 'POST':
        course_id = request.form['course_id']
        date = str(request.form['date_to_modify'])
        student_id = str(request.form['student_id'])
        get_status_query = "SELECT status FROM attendance WHERE student_id
= %s AND course_id = %s AND date = %s;"
        cursor.execute(get_status_query, (student_id, course_id, date))
        status_result = cursor.fetchall()
        return render_template('manual_attendance.html', status=status_result)
    return render_template('manual_attendance.html', status=[])


@app.route("/modify_attendance", methods=['GET', 'POST'])
def modify_attendance():
    if request.method == 'POST':
        course_id = request.form['course_id']
        date = str(request.form['date_to_modify'])
        student_id = str(request.form['student_id'])
        new_status = request.form['status']
        print("hii", date)
        update_attendance_query = "UPDATE attendance SET status = %s WHERE
student_id = %s AND course_id = %s AND date = %s;"

        cursor.execute(update_attendance_query,
                       (new_status, student_id, course_id, date))
        print("Attendance modified successfully!")
        get_status_query = "SELECT status FROM attendance WHERE student_id
= %s AND course_id = %s AND date = %s;"
        cursor.execute(get_status_query, (student_id, course_id, date))
        status_result = cursor.fetchall()
        print(student_id, "\t", status_result[0][0])
        return render_template('manual_attendance.html')
    return render_template('manual_attendance.html')


@app.route("/particular_day_attendance.html", methods=['GET', 'POST'])
def check_particular_day_attendance():
    if request.method == 'POST':
```



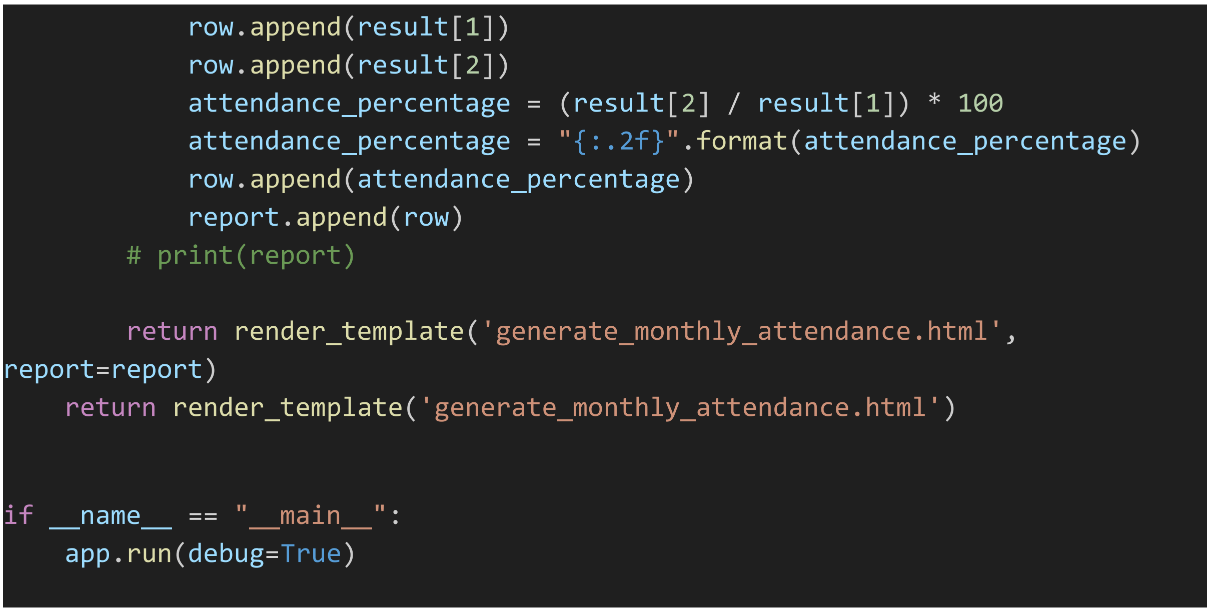
```
        date = str(request.form['date_to_check'])
        course_id = request.form['course_id']
        cursor.execute(
            "select student_id, status from attendance where date = %s AND 
course_id = %s", (date, course_id))
        result = cursor.fetchall()
        present_students = []
        absent_students = []
        for student_id, status in result:
            if status == "present":
                present_students.append(student_id)
            elif status == "absent":
                absent_students.append(student_id)
        students = []
        students.append(present_students)
        students.append(absent_students)
        return render_template('particular_day_attendance.html', 
students=students)
    return render_template('particular_day_attendance.html', students=[])


@app.route("/particular_student_attendance.html", methods=['GET', 'POST'])
def check_particular_student_attendance():
    if request.method == 'POST':
        course_id = request.form['course_id']
        date = str(request.form['date_to_check'])
        student_id = request.form['student_id']
        existing_record = is_existing_student(
            cursor, student_id, course_id, date)
        if existing_record:
            students = []
            print(existing_record[4])
            students.append("")
            students.append(existing_record[4])
            return render_template('particular_student_attendance.html', 
students=students)
        else:
            students = []
            print("No record found")
            students.append("student id not found")
            students.append("")
            return render_template('particular_student_attendance.html', 
students=students)
    return render_template('particular_student_attendance.html')


@app.route("/attendance_trend_chart.html", methods=['GET', 'POST'])
def attendance_trend_chart():
    if request.method == 'POST':
        course_id = request.form['course_id']
        start_date = request.form['start_date']
        end_date = request.form['end_date']

        date_range_attendance_query = """
                    SELECT date,
                    SUM(CASE WHEN status = 'Present' THEN 1 ELSE 0 END) AS
present_count,
                    SUM(CASE WHEN status = 'Absent' THEN 1 ELSE 0 END) AS
absent_count
                FROM
                    attendance
                WHERE
                    course_id = %s AND
                    date BETWEEN %s AND %s
                GROUP BY
                    date
                ORDER BY
                    date;
                """
        cursor.execute(date_range_attendance_query,
                       (course_id, start_date, end_date))
        data = cursor.fetchall()
        df = pd.DataFrame(
            data, columns=['date', 'present_count', 'absent_count'])
        img_path = "static/Images/plot.png"

        plt.figure(figsize=(8, 6))
        plt.plot(df['date'], df['present_count'], label='Present', marker='o')
        plt.plot(df['date'], df['absent_count'], label='Absent', marker='o')
        plt.xlabel('Date')
        plt.ylabel('Number of Students')
        plt.title(f'Attendance from {start_date} to {end_date}')
        plt.subplots_adjust(bottom=0.2)
        plt.xticks(rotation=45)
        plt.legend()
        plt.grid(True)
        for i, row in df.iterrows():
            plt.text(row['date'], row['present_count']+2,
                     str(row['present_count']), ha='center', va='top',
fontsize=8)
            plt.text(row['date'], row['absent_count']+2,
                     str(row['absent_count']), ha='center', va='top',
fontsize=8)
        plt.savefig(img_path, format='png')

        plt.close()
```



```
        return render_template('attendance_trend_chart.html',
image_path="Images/plot.png")

    return render_template('attendance_trend_chart.html', image_path="")


@app.route("/create_attendance_excel.html", methods=['GET', 'POST'])
def create_attendance_excel():
    if request.method == 'POST':
        start_date = str(request.form['start_date'])
        end_date = str(request.form['end_date'])
        course_id = request.form['course_id']

        start_date = start_date.replace(":", "-")
        end_date = end_date.replace(":", "-")

        file_name = f"{course_id}attendance{start_date}to{end_date}.xlsx"

        query = """
        SELECT
            a.student_id,
            s.name AS student_name,
            s.email AS student_email,
            COUNT(*) AS total_classes_conducted,
            SUM(CASE WHEN a.status = 'present' THEN 1 ELSE 0 END) AS
classes_attended
        FROM attendance a
        JOIN student s ON a.student_id = s.student_id
        WHERE a.course_id = %s AND a.date BETWEEN %s AND %s
        GROUP BY a.student_id;
        """

        cursor.execute(query, (course_id, start_date, end_date))
        attendance_data = cursor.fetchall()
        # print("hiii",attendance_data)
        if not attendance_data:
            status = "No attendance records found for the specified date
range."
            return render_template('create_attendance_excel.html',
status=status)
        else:
            df = pd.DataFrame(
                attendance_data,
                columns=[
                    "Student ID",
                    "Student Name",
                    "Student Email",
                    "Total Classes Conducted",
                    "Classes Attended"
```



```
                ]
            )

            df["Attendance Percentage"] = (
                df["Classes Attended"] / df["Total Classes Conducted"]) * 100
            df = df.sort_values(by="Attendance Percentage", ascending=False)

            wb = Workbook()
            ws = wb.active

            for col_num, column_title in enumerate(df.columns, 1):
                ws.cell(row=1, column=col_num, value=column_title)

            for record in df.to_records(index=False):
                ws.append(list(record))

            wb.save(file_name)

            status = (
                f"Student attendance performance excel sheet for {course_id}
between {start_date} and {end_date} has been saved to '{file_name}'.")

            return render_template('create_attendance_excel.html',
status=status)
    return render_template('create_attendance_excel.html', status=[])


@app.route("/generate_monthly_attendance.html", methods=['GET', 'POST'])
def generate_monthly_attendance():
    if request.method == 'POST':
        course_id = request.form['course_id']
        year = request.form['year']
        month = request.form['month']
        start_date = f"{year}-{month}-01"
        end_date = f"{year}-{month}-31"
        report_query = """
        SELECT student_id, COUNT(*) AS total_classes,
            SUM(CASE WHEN status = 'present' THEN 1 ELSE 0 END) AS
attended_classes
        FROM attendance
        WHERE course_id = %s AND date BETWEEN %s AND %s
        GROUP BY student_id;
        """
        cursor.execute(report_query, (course_id, start_date, end_date))
        report_data = cursor.fetchall()
        report = []
        for result in report_data:
            row = []
            row.append(result[0])
```



```
            row.append(result[1])
            row.append(result[2])
            attendance_percentage = (result[2] / result[1]) * 100
            attendance_percentage = "{:.2f}".format(attendance_percentage)
            row.append(attendance_percentage)
            report.append(row)
        # print(report)

        return render_template('generate_monthly_attendance.html',
report=report)
    return render_template('generate_monthly_attendance.html')


if __name__ == "__main__":
    app.run(debug=True)
```

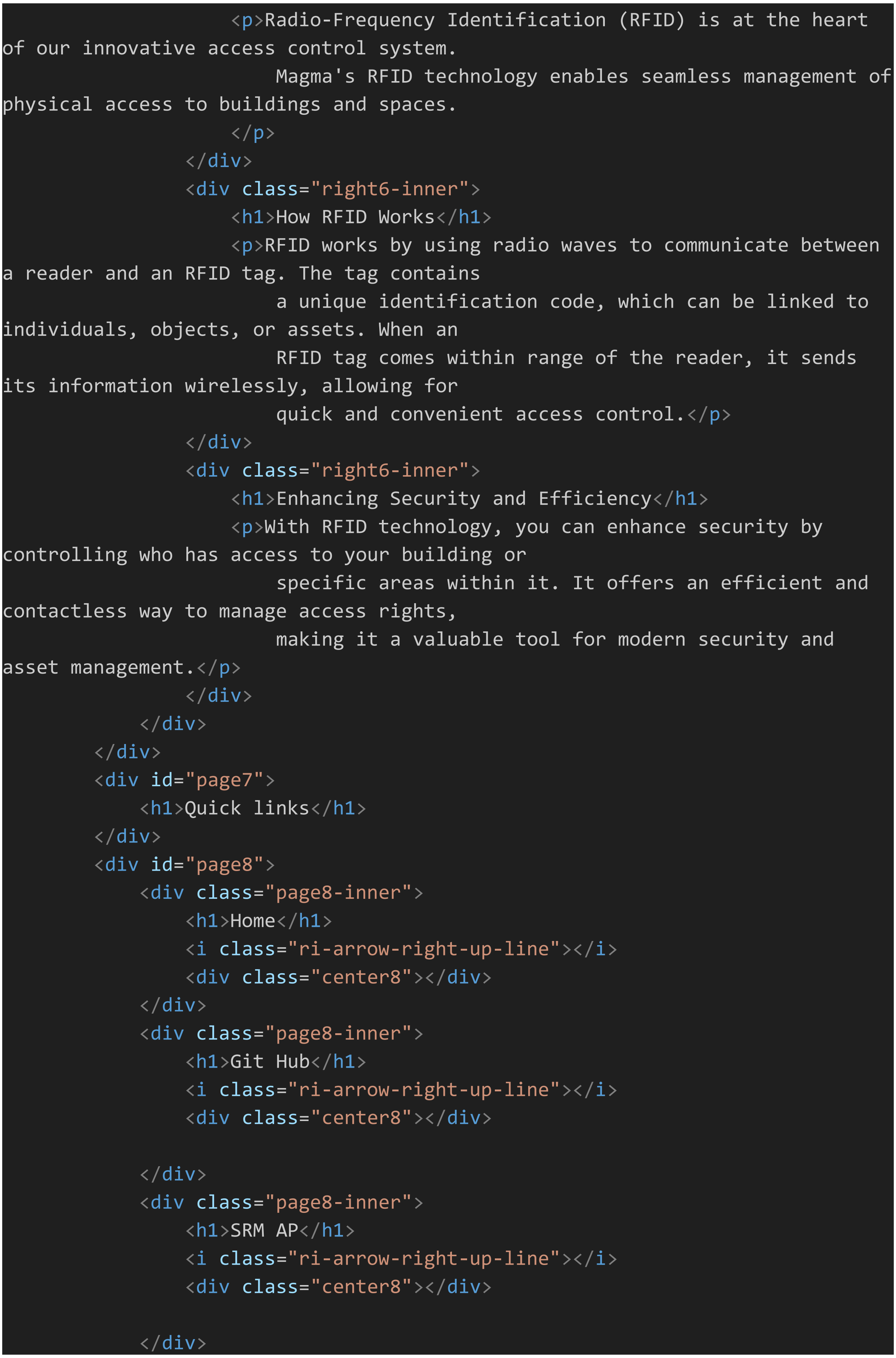
record_attendance.py

```python
import socket
import mysql.connector
from datetime import datetime

db_config = {
    'host': 'localhost',
    'user': 'root',
    'password': 'Nani@01012004',
    'database': 'dbms_project',
}

UDP_IP = "0.0.0.0"
UDP_PORT = 8888

sock = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
sock.bind((UDP_IP, UDP_PORT))

try:
    conn = mysql.connector.connect(**db_config)
    cursor = conn.cursor()
    print("Connected to the database")
except mysql.connector.Error as err:
    print(f"Error: {err}")
    exit()


def get_course_id():
    date = datetime.now()
    day_of_week = date.strftime('%A')
    time = date.strftime("%H:%M:%S")
    fetch_course_id_query = "SELECT course_id FROM timetable WHERE day = %s
AND %s BETWEEN start_time AND end_time"
    cursor.execute(fetch_course_id_query, (day_of_week, time))
    course_id_result = cursor.fetchone()
    if course_id_result:
        return course_id_result[0]
    else:
        return None


course_id = get_course_id()

while True:
    data, addr = sock.recvfrom(1024)
    student_id = data.decode()
    student_id = student_id[:-1]
    print(student_id)
    now = datetime.now()
    date = now.strftime("%Y-%m-%d")
    time = now.strftime("%H:%M:%S")
    status = "present"
    try:
        cursor.execute("UPDATE attendance set status=%s,time=%s where 
student_id=%s and course_id=%s and date=%s",
                       (status, time, student_id, course_id, date))
        conn.commit()
        print("Recorded attendance for Student ID:", student_id)
    except mysql.connector.Error as err:
        print(f"Error: {err}")
```

index.html

```html
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
    <link rel="stylesheet" href="../static/style.css">
    <link
href="https://cdn.jsdelivr.net/npm/remixicon@3.2.0/fonts/remixicon.css"
rel="stylesheet">
    <link rel="stylesheet" href="https://cdn.jsdelivr.net/npm/locomotive-
scroll@3.5.4/dist/locomotive-scroll.css">
</head>

<body>
    <div id="main">
        <div data-scroll data-scroll-speed="-10" id="page1">
            <nav>
                <img src="../static/Images/Srm logo.png" alt="">
                <div id="right-nav">
                    <button>Options</button>
                    <button>About us</button>
                    <button><i class="ri-menu-fill"></i></button>
                </div>
            </nav>
            <div class="bottom-page1">
                <h1> Smart Attendance<br> Management System</h1> `
                <div class="bottom-page1-inner">
                    <h4>Efficiency in Every Tap,<br> Precision in Every
Record.</h4>
                </div>
            </div>
            <video src="../static/Videos/vid.mp4" autoplay loop muted></video>
        </div>
        <div id="page2">
            <h2>Attendance Management System using RFID</h2>
            <h1>Smart Attendance Management System employs RFID technology for
automated tracking, optimizing classroom
                efficiency, and ensuring accurate record-keeping.
            </h1>
        </div>
        <div id="page3">
            <h1>Choose an Option</h1>
            <div class="options-container">
                <a href="record_attendance.html" class="option">Scan ID <br>
Cards</a>
```

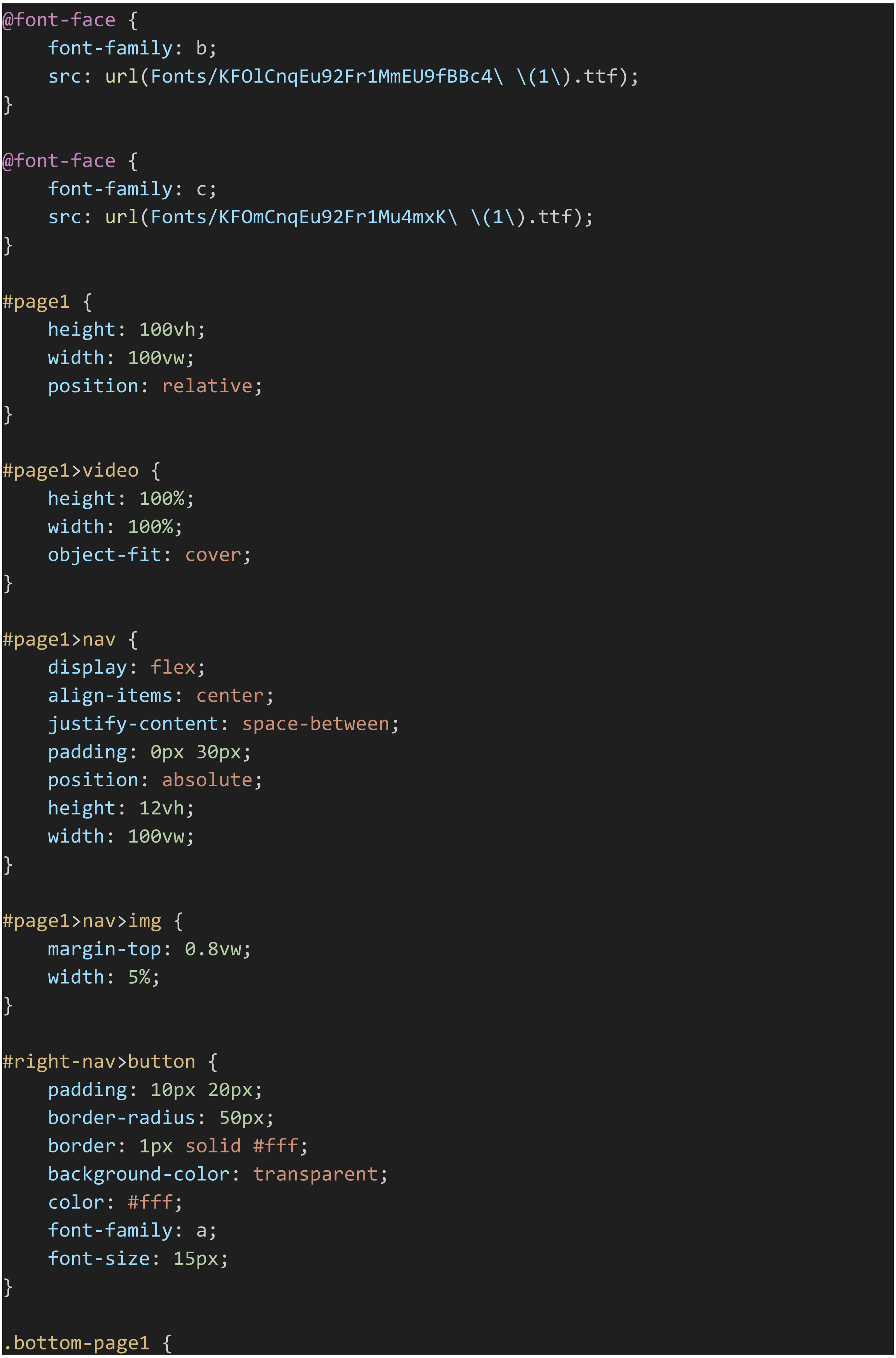
```
                <a href="manual_attendance.html" class="option">Manual
<br>Attendance</a>
                <a href="check_attendance_range.html" class="option">Details
of Students <br>With in
                    Particular
                    <br>Attendance
                    range</a>
                <a href="generate_monthly_attendance.html"
class="option">Monthly Report</a>
                <a href="particular_student_attendance.html"
class="option">Check the <br> attendance of a <br>
                    student</a>
                <a href="particular_day_attendance.html"
class="option">Attendance Report <br>of a particular
                    <br>day</a>
                <a href="send_mail.html" class="option">Send alert mails</a>
                <a href="attendance_trend_chart.html"
class="option">Attendance trend <br> Chart</a>
                <a href="create_attendance_excel.html" class="option">Get
Attendance <br> detials <br> in Excel
                    Fromat</a>
            </div>
        </div>
        <div id="page4">
            <h3>About the RFID Technology</h3>
            <h1>RFID technology plays a pivotal role in this system by
providing secure, contactless student
                identification, effectively automating attendance management,
reducing manual workload, and ensuring
                real-time, precise record-keeping. This innovation streamlines
the entire process, making it more
                efficient, accurate, and user-friendly, ultimately improving
the educational experience for both
                educators and students.</h1>
        </div>
        <div id="page5">
            <div class="left5">
                <h1>What is <br> RFID?</h1>
            </div>
            <div class="right5">
                <div class="right5-center"></div>
            </div>
        </div>
        <div id="page6">
            <div class="right6">
                <div class="right6-inner">
                    <h1>RFID Technology: Simplifying Access Control</h1>
```



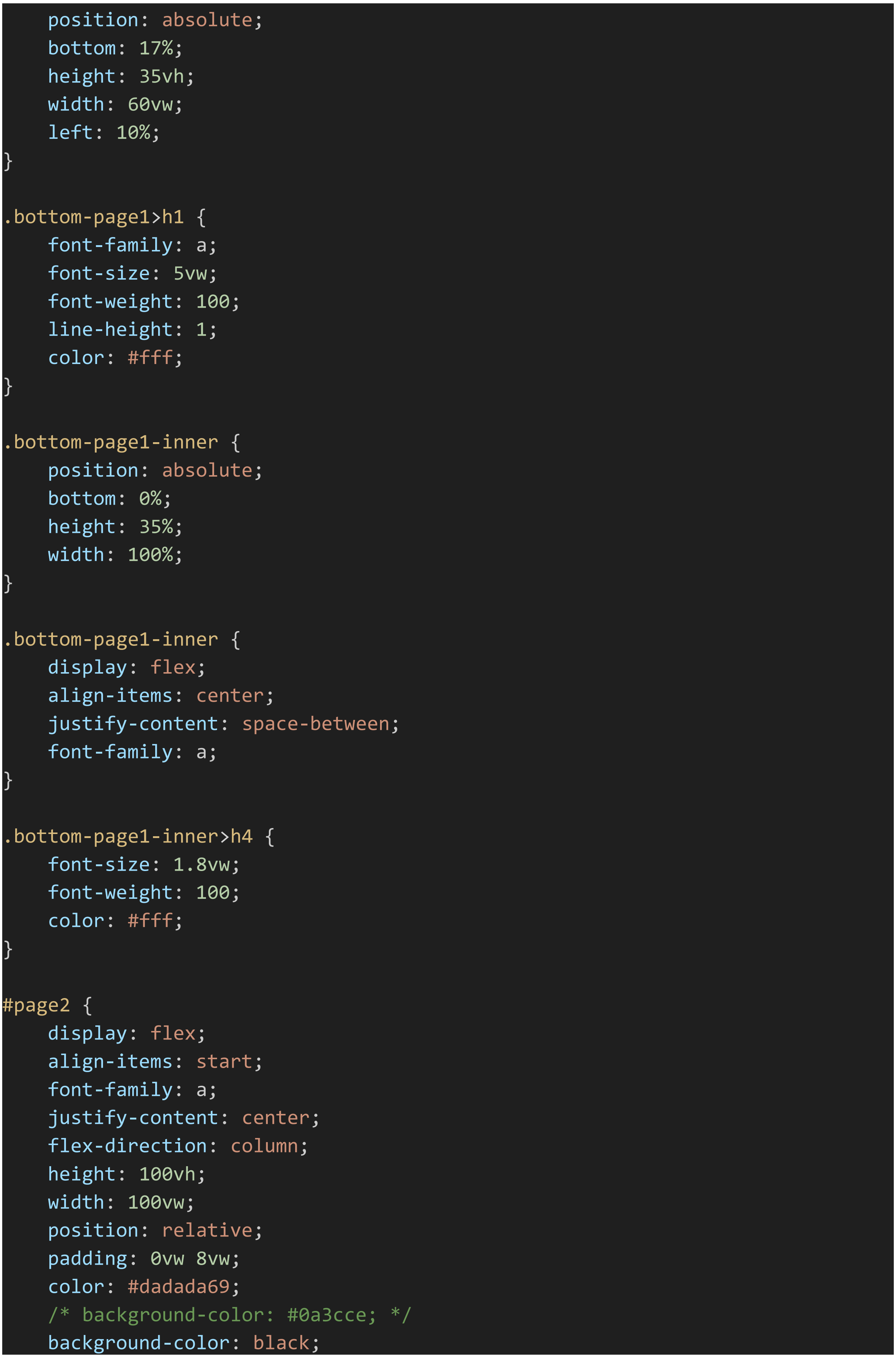
```
                    <p>Radio-Frequency Identification (RFID) is at the heart
of our innovative access control system.
                        Magma's RFID technology enables seamless management of
physical access to buildings and spaces.
                    </p>
                </div>
                <div class="right6-inner">
                    <h1>How RFID Works</h1>
                    <p>RFID works by using radio waves to communicate between
a reader and an RFID tag. The tag contains
                        a unique identification code, which can be linked to
individuals, objects, or assets. When an
                        RFID tag comes within range of the reader, it sends
its information wirelessly, allowing for
                        quick and convenient access control.</p>
                </div>
                <div class="right6-inner">
                    <h1>Enhancing Security and Efficiency</h1>
                    <p>With RFID technology, you can enhance security by
controlling who has access to your building or
                        specific areas within it. It offers an efficient and
contactless way to manage access rights,
                        making it a valuable tool for modern security and
asset management.</p>
                </div>
            </div>
        </div>
        <div id="page7">
            <h1>Quick links</h1>
        </div>
        <div id="page8">
            <div class="page8-inner">
                <h1>Home</h1>
                <i class="ri-arrow-right-up-line"></i>
                <div class="center8"></div>
            </div>
            <div class="page8-inner">
                <h1>Git Hub</h1>
                <i class="ri-arrow-right-up-line"></i>
                <div class="center8"></div>

            </div>
            <div class="page8-inner">
                <h1>SRM AP</h1>
                <i class="ri-arrow-right-up-line"></i>
                <div class="center8"></div>

            </div>
        </div>
    </div>

    <script src="https://cdn.jsdelivr.net/npm/locomotive-
scroll@3.5.4/dist/locomotive-scroll.js"></script>
    <script
src="https://cdnjs.cloudflare.com/ajax/libs/gsap/3.12.1/gsap.min.js"
        integrity="sha512-
qF6akR/fsZAB4Co1QDDnUXWnaQseLGXoniuSuSlPQK6+aWhlMZcHzkasCSlnWoe+TJuudlka1/IQ01
Dnhgq95g=="
        crossorigin="anonymous" referrerpolicy="no-referrer"></script>
    <script
src="https://cdnjs.cloudflare.com/ajax/libs/gsap/3.12.1/ScrollTrigger.min.js"
        integrity="sha512-
IHDCHrefnBT3vOCsvdkMvJF/MCPz/nBauQLzJkupa4Gn4tYg5a6VGyzIrjo6QAUy3We5HFOZUlkUpP
0dkgE60A=="
        crossorigin="anonymous" referrerpolicy="no-referrer"></script>
    <script src="../static/script.js"></script>
</body>

</html>
```

style.css

```
* {
    margin: 0%;
    padding: 0%;
    box-sizing: border-box;
}

html,
body {
    height: 100%;
    width: 100%;
}

#main {
    position: relative;
    overflow: hidden;
    /* background-color: #0a3cce; */
    background-color: black;
}

@font-face {
    font-family: a;
    src: url(Fonts/jost-variable.ttf);
}
```

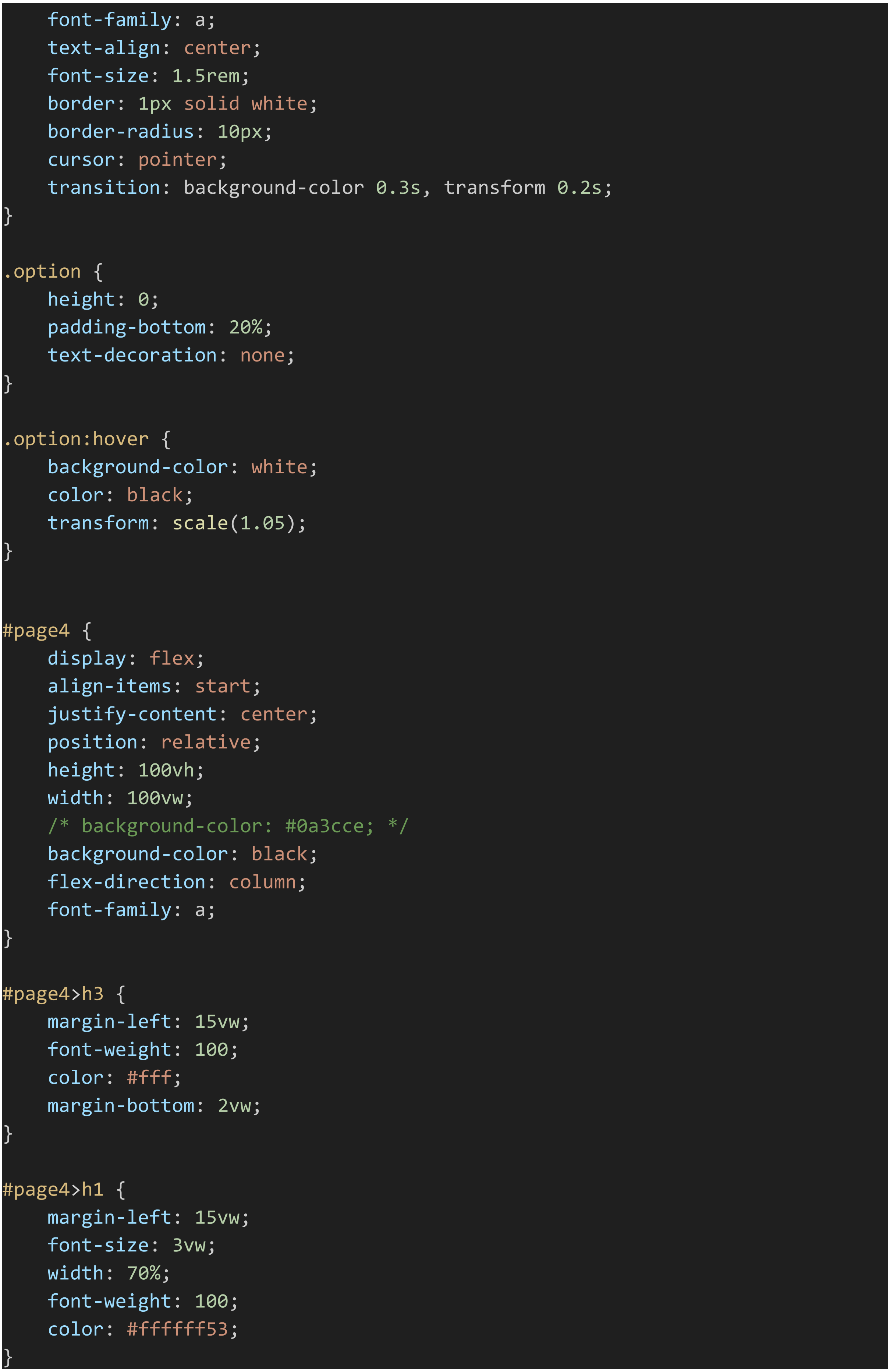


```
@font-face {
    font-family: b;
    src: url(Fonts/KFOlCnqEu92Fr1MmEU9fBBc4\ \(1\).ttf);
}

@font-face {
    font-family: c;
    src: url(Fonts/KFOmCnqEu92Fr1Mu4mxK\ \(1\).ttf);
}

#page1 {
    height: 100vh;
    width: 100vw;
    position: relative;
}

#page1>video {
    height: 100%;
    width: 100%;
    object-fit: cover;
}

#page1>nav {
    display: flex;
    align-items: center;
    justify-content: space-between;
    padding: 0px 30px;
    position: absolute;
    height: 12vh;
    width: 100vw;
}

#page1>nav>img {
    margin-top: 0.8vw;
    width: 5%;
}

#right-nav>button {
    padding: 10px 20px;
    border-radius: 50px;
    border: 1px solid #fff;
    background-color: transparent;
    color: #fff;
    font-family: a;
    font-size: 15px;
}

.bottom-page1 {
```



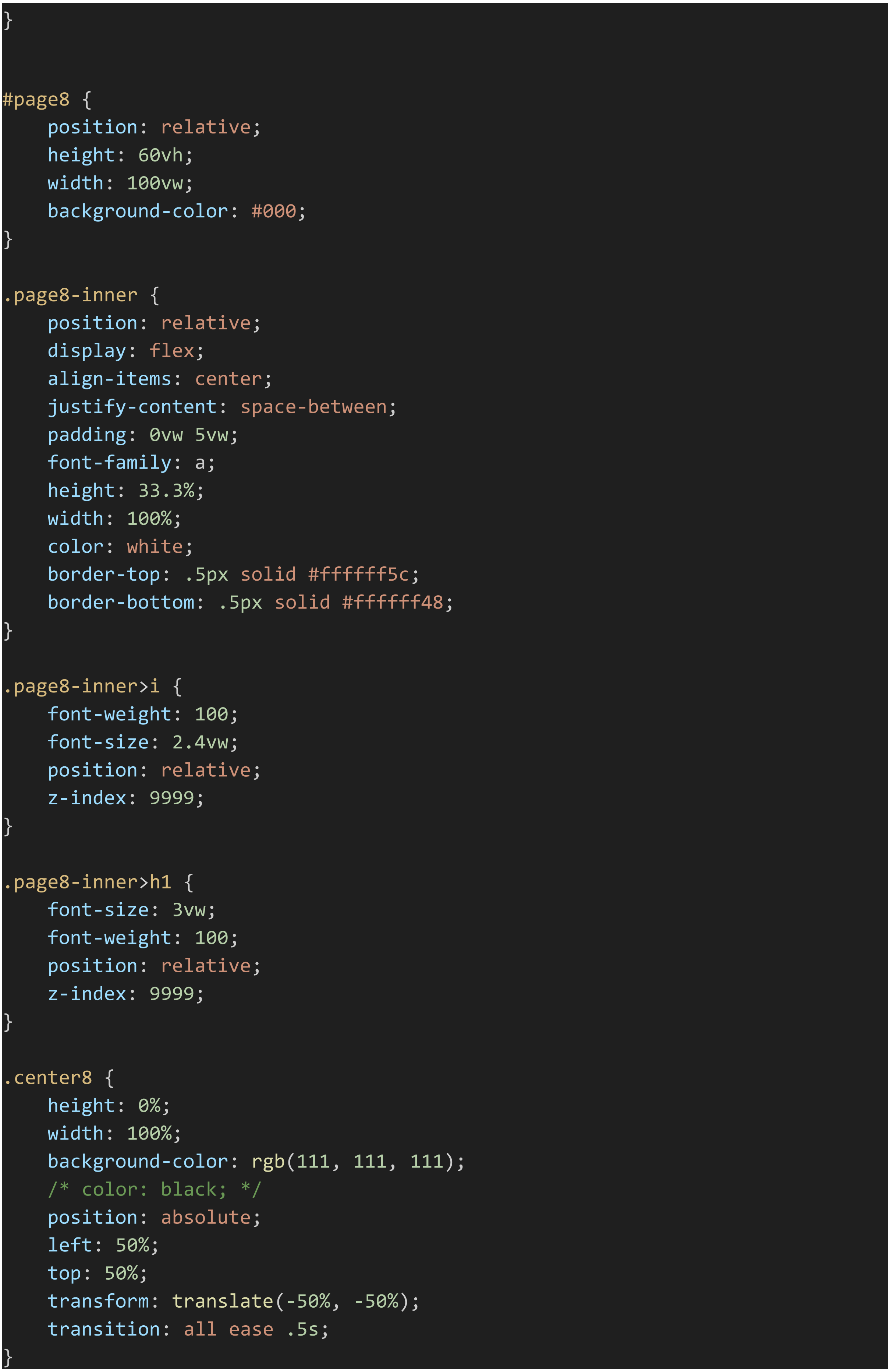
```css
    position: absolute;
    bottom: 17%;
    height: 35vh;
    width: 60vw;
    left: 10%;
}

.bottom-page1>h1 {
    font-family: a;
    font-size: 5vw;
    font-weight: 100;
    line-height: 1;
    color: #fff;
}

.bottom-page1-inner {
    position: absolute;
    bottom: 0%;
    height: 35%;
    width: 100%;
}

.bottom-page1-inner {
    display: flex;
    align-items: center;
    justify-content: space-between;
    font-family: a;
}

.bottom-page1-inner>h4 {
    font-size: 1.8vw;
    font-weight: 100;
    color: #fff;
}

#page2 {
    display: flex;
    align-items: start;
    font-family: a;
    justify-content: center;
    flex-direction: column;
    height: 100vh;
    width: 100vw;
    position: relative;
    padding: 0vw 8vw;
    color: #dadada69;
    /* background-color: #0a3cce; */
    background-color: black;
```

```
}

#page2>h2 {
    margin-bottom: 3vw;
    font-weight: 100;
    color: #fff;
}

#page2>h1 {
    font-weight: 100;
    line-height: 1.3;
    width: 90%;
    font-size: 4vw;
    color: #dadada69;
}

#page3 {
    display: flex;
    align-items: center;
    justify-content: center;
    flex-direction: column;
    position: relative;
    height: 100vh;
    width: 100vw;
    background-color: black;
    font-family: a;
}

#page3>h1 {
    font-size: 3rem;
    font-weight: 100;
    color: #fff;
}

.options-container {
    display: flex;
    flex-wrap: wrap;
    justify-content: center;
    gap: 20px;
    margin-top: 20px;
}

.option {
    width: calc(18% - 20px);
    /* Square-shaped, and gap included */
    padding: 20px;
    background-color: black;
    color: #fff;
```



```css
    font-family: a;
    text-align: center;
    font-size: 1.5rem;
    border: 1px solid white;
    border-radius: 10px;
    cursor: pointer;
    transition: background-color 0.3s, transform 0.2s;
}

.option {
    height: 0;
    padding-bottom: 20%;
    text-decoration: none;
}

.option:hover {
    background-color: white;
    color: black;
    transform: scale(1.05);
}


#page4 {
    display: flex;
    align-items: start;
    justify-content: center;
    position: relative;
    height: 100vh;
    width: 100vw;
    /* background-color: #0a3cce; */
    background-color: black;
    flex-direction: column;
    font-family: a;
}

#page4>h3 {
    margin-left: 15vw;
    font-weight: 100;
    color: #fff;
    margin-bottom: 2vw;
}

#page4>h1 {
    margin-left: 15vw;
    font-size: 3vw;
    width: 70%;
    font-weight: 100;
    color: #ffffff53;
}
```

```
#page5 {
    display: flex;
    position: relative;
    height: 100vh;
    width: 100vw;
    /* background-color: #0a3cce; */
    background-color: black;
}

.left5 {
    height: 100%;
    width: 40%;
    position: relative;
    font-family: a;
}

.left5>h1 {
    position: absolute;
    top: 40%;
    right: 30%;
    transform: translateY(-50%);
    font-size: 5vw;
    font-weight: 100;
    color: #fff;
    line-height: 1;
}

.right5 {
    height: 100%;
    width: 60%;
    position: relative;
}

.right5-center {
    height: 50%;
    width: 85%;
    border-radius: 10px;
    position: absolute;
    top: 50%;
    transform: translateY(-50%);
    background-image: url(Images/RFID_img.jpg);
    background-size: cover;
    left: 0%;
}

#page6 {
    position: relative;
    height: 100vh;
    width: 100vw;
    /* background-color: #0a3cce; */
    background-color: black;
}

.right6 {
    height: 100%;
    width: 60%;
    position: relative;
    left: 40%;
}

.right6-inner {
    display: flex;
    align-items: start;
    flex-direction: column;
    height: 33.3%;
    width: 100%;
    font-family: a;
    color: #fff;
}

.right6-inner>h1 {
    font-size: 2vw;
}

.right6-inner>p {
    margin-top: 2vw;
    font-size: 1.3vw;
    width: 80%;
}

#page7 {
    position: relative;
    height: 40vh;
    width: 100vw;
    background-color: white;
    color: black;
    font-family: a;
    padding: 7vw 10vw;
}

#page7>h1 {
    top: 5%;
    font-size: 5vw;
    line-height: 1;
    font-weight: 100;
```



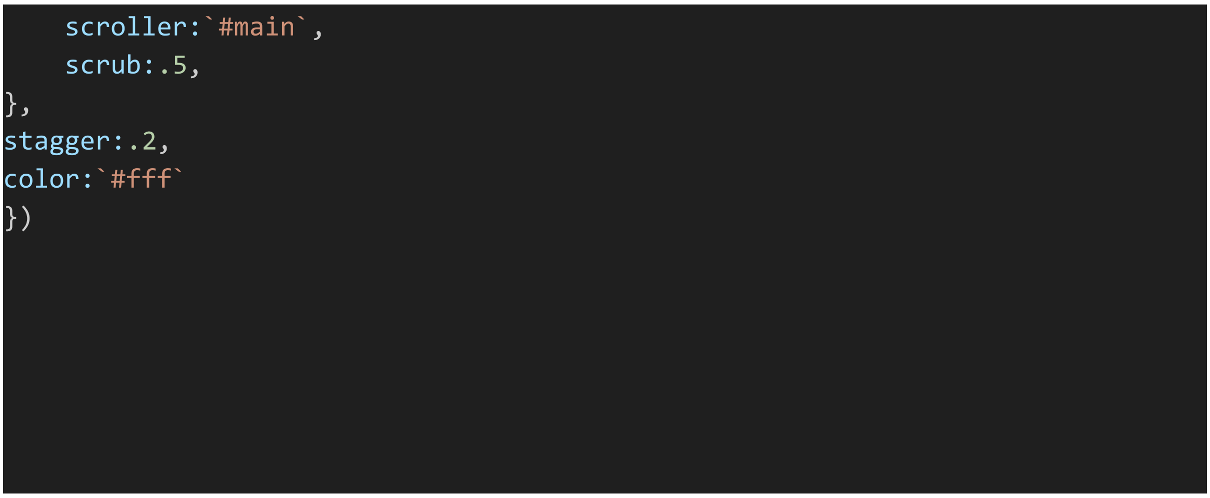
```
}


#page8 {
    position: relative;
    height: 60vh;
    width: 100vw;
    background-color: #000;
}

.page8-inner {
    position: relative;
    display: flex;
    align-items: center;
    justify-content: space-between;
    padding: 0vw 5vw;
    font-family: a;
    height: 33.3%;
    width: 100%;
    color: white;
    border-top: .5px solid #ffffff5c;
    border-bottom: .5px solid #ffffff48;
}

.page8-inner>i {
    font-weight: 100;
    font-size: 2.4vw;
    position: relative;
    z-index: 9999;
}

.page8-inner>h1 {
    font-size: 3vw;
    font-weight: 100;
    position: relative;
    z-index: 9999;
}

.center8 {
    height: 0%;
    width: 100%;
    background-color: rgb(111, 111, 111);
    /* color: black; */
    position: absolute;
    left: 50%;
    top: 50%;
    transform: translate(-50%, -50%);
    transition: all ease .5s;
}
```

```css
.page8-inner:hover .center8 {
    height: 100%;
    color: black;
}
```

script.js

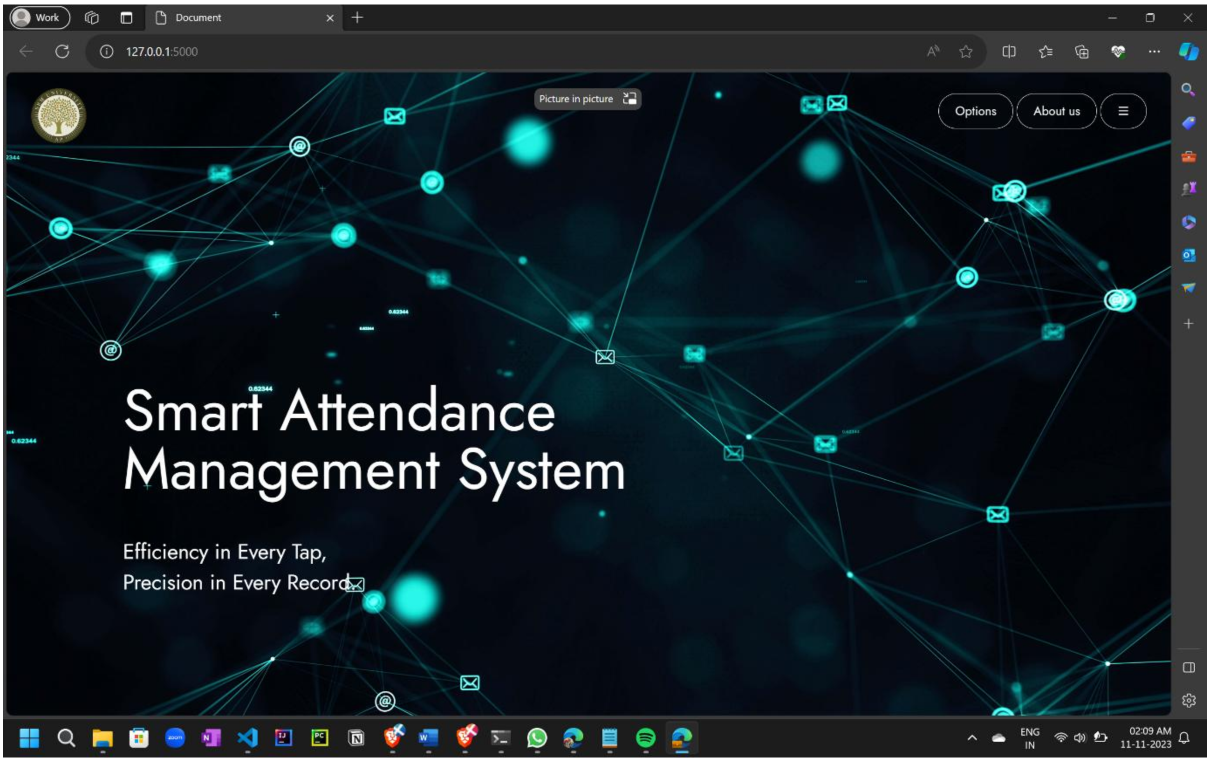
```javascript
function loco(){
  gsap.registerPlugin(ScrollTrigger);

// Using Locomotive Scroll from Locomotive
https://github.com/locomotivemtl/locomotive-scroll

const locoScroll = new LocomotiveScroll({
el: document.querySelector("#main"),
smooth: true
});
// each time Locomotive Scroll updates, tell ScrollTrigger to update too (sync
positioning)
locoScroll.on("scroll", ScrollTrigger.update);

// tell ScrollTrigger to use these proxy methods for the "#main" element since
Locomotive Scroll is hijacking things
ScrollTrigger.scrollerProxy("#main", {
scrollTop(value) {
  return arguments.length ? locoScroll.scrollTo(value, 0, 0) :
locoScroll.scroll.instance.scroll.y;
}, // we don't have to define a scrollLeft because we're only scrolling
vertically.
getBoundingClientRect() {
  return {top: 0, left: 0, width: window.innerWidth, height:
window.innerHeight};
},
// LocomotiveScroll handles things completely differently on mobile devices -
it doesn't even transform the container at all! So to get the correct behavior
and avoid jitters, we should pin things with position: fixed on mobile. We
sense it by checking to see if there's a transform applied to the container
(the LocomotiveScroll-controlled element).
pinType: document.querySelector("#main").style.transform ? "transform" :
"fixed"
});

// each time the window updates, we should refresh ScrollTrigger and then
update LocomotiveScroll.
ScrollTrigger.addEventListener("refresh", () => locoScroll.update());
```

```
// after everything is set up, refresh() ScrollTrigger and update LocomotiveScroll because padding may have been added for pinning, etc.
ScrollTrigger.refresh();
}
loco()




var clutter = "";

document.querySelector("#page2>h1").textContent.split("").forEach(function(dets){
  clutter += `<span>${dets}</span>`

  document.querySelector("#page2>h1").innerHTML = clutter;
})


gsap.to("#page2>h1>span",{
  scrollTrigger:{
      trigger:`#page2>h1>span`,
      start:`top bottom`,
      end:`bottom top`,
      scroller:`#main`,
      scrub:.5,
  },
  stagger:.2,
  color:`#fff`
})





var clutter = "";

document.querySelector("#page4>h1").textContent.split("").forEach(function(dets){
  clutter += `<span>${dets}</span>`

  document.querySelector("#page4>h1").innerHTML = clutter;
})

gsap.to("#page4>h1>span",{
scrollTrigger:{
    trigger:`#page4>h1>span`,
    start:`top bottom`,
    end:`bottom top`,
```



```
    scroller:`#main`,
    scrub:.5,
},
stagger:.2,
color:`#fff`
})
```

Screenshots

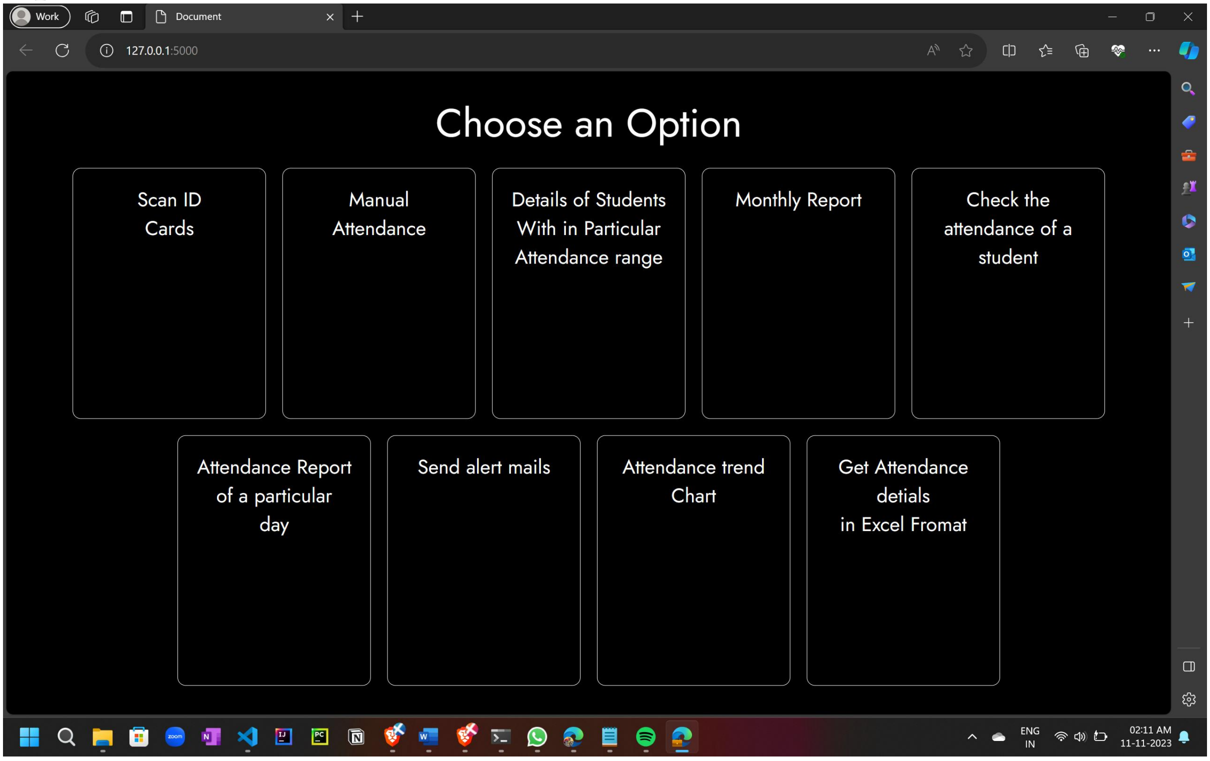


Smart Attendance Management System

Efficiency in Every Tap,
Precision in Every Record

1. **Home page**

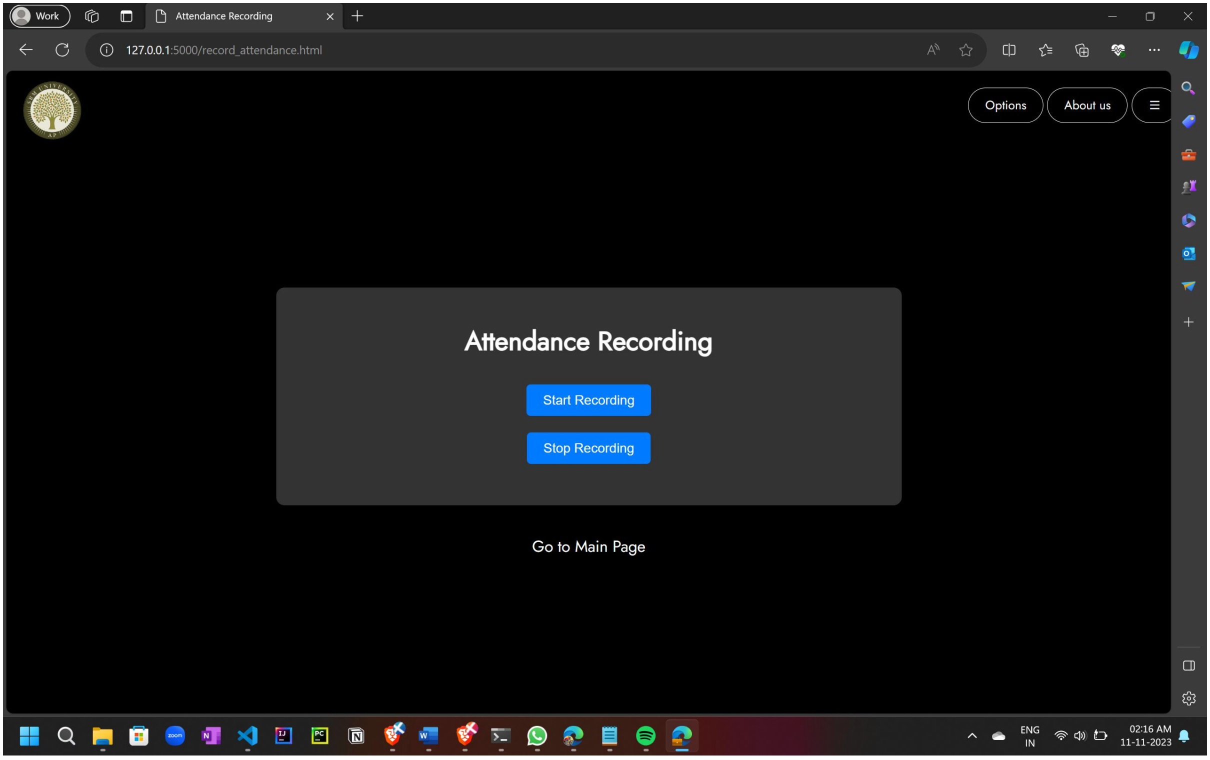
2. **Options**


Work
Document
127.0.0.1:5000
ENG
IN
02:11 AM
11-11-2023

Choose an Option

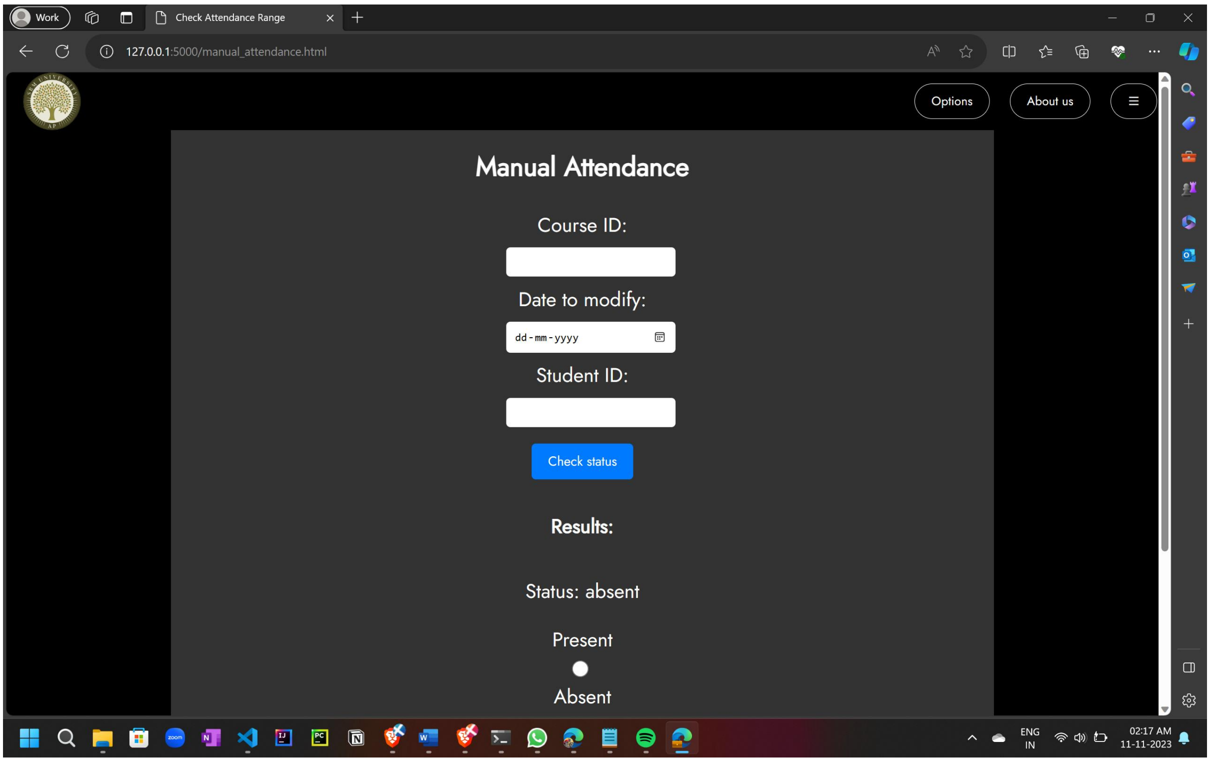
Scan ID Cards
Manual Attendance
Details of Students With in Particular Attendance range
Monthly Report
Check the attendance of a student
Attendance Report of a particular day
Send alert mails
Attendance trend Chart
Get Attendance detials in Excel Fromat

3. Scanning ID Cards



Attendance Recording

4. Manual attendance



Manual Attendance

Course ID:

Date to modify: dd-mm-yyyy

Student ID:

Results:

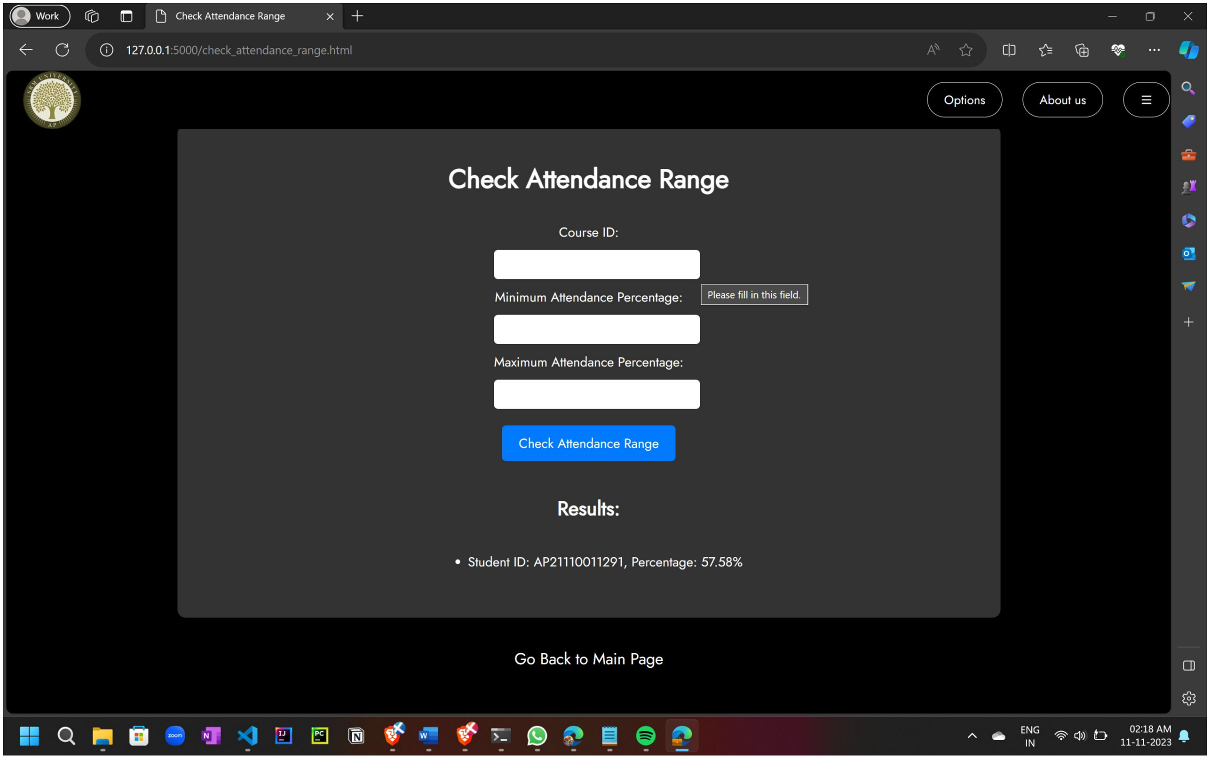
Status: absent

Present

○

Absent

5. Details of Students within a particular range



Check Attendance Range

Course ID:

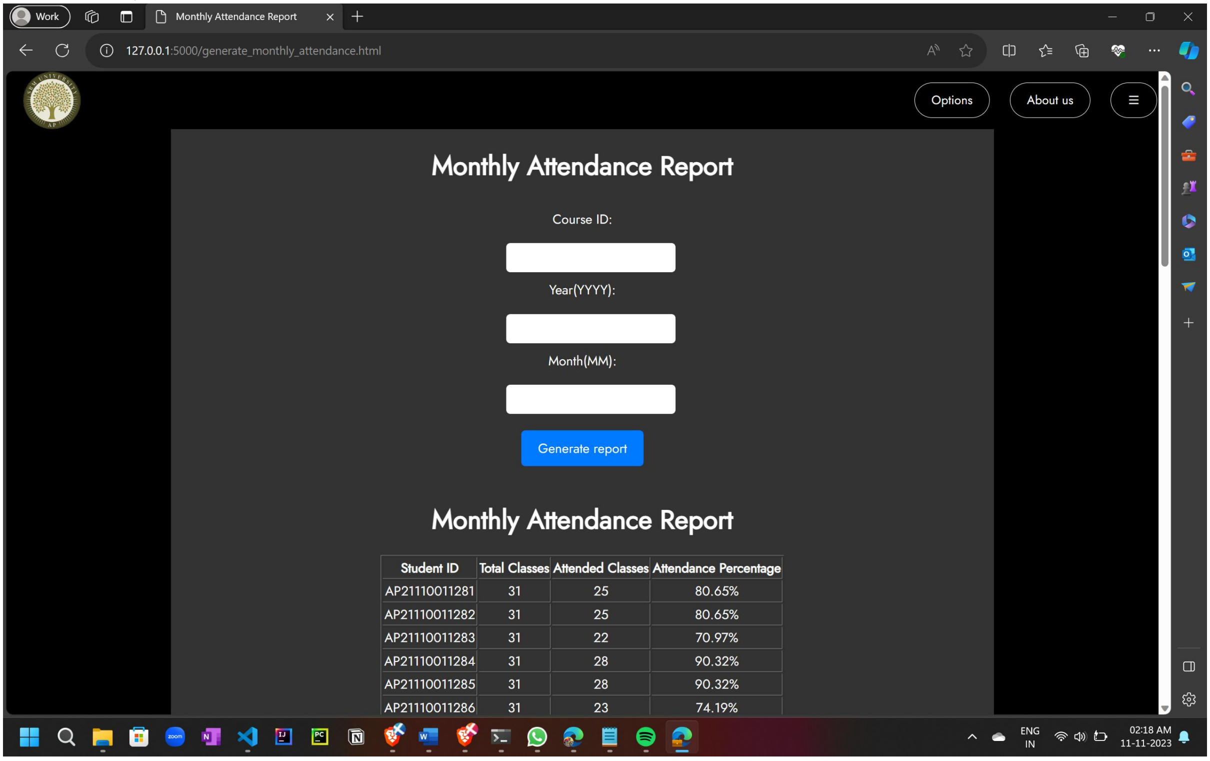
Minimum Attendance Percentage:

Maximum Attendance Percentage:

Results:

- Student ID: AP21110011291, Percentage: 57.58%

6. Monthly report



Work
Monthly Attendance Report
127.0.0.1:5000/generate_monthly_attendance.html
Options
About us
≡

Monthly Attendance Report

Course ID:

Year(YYYY):

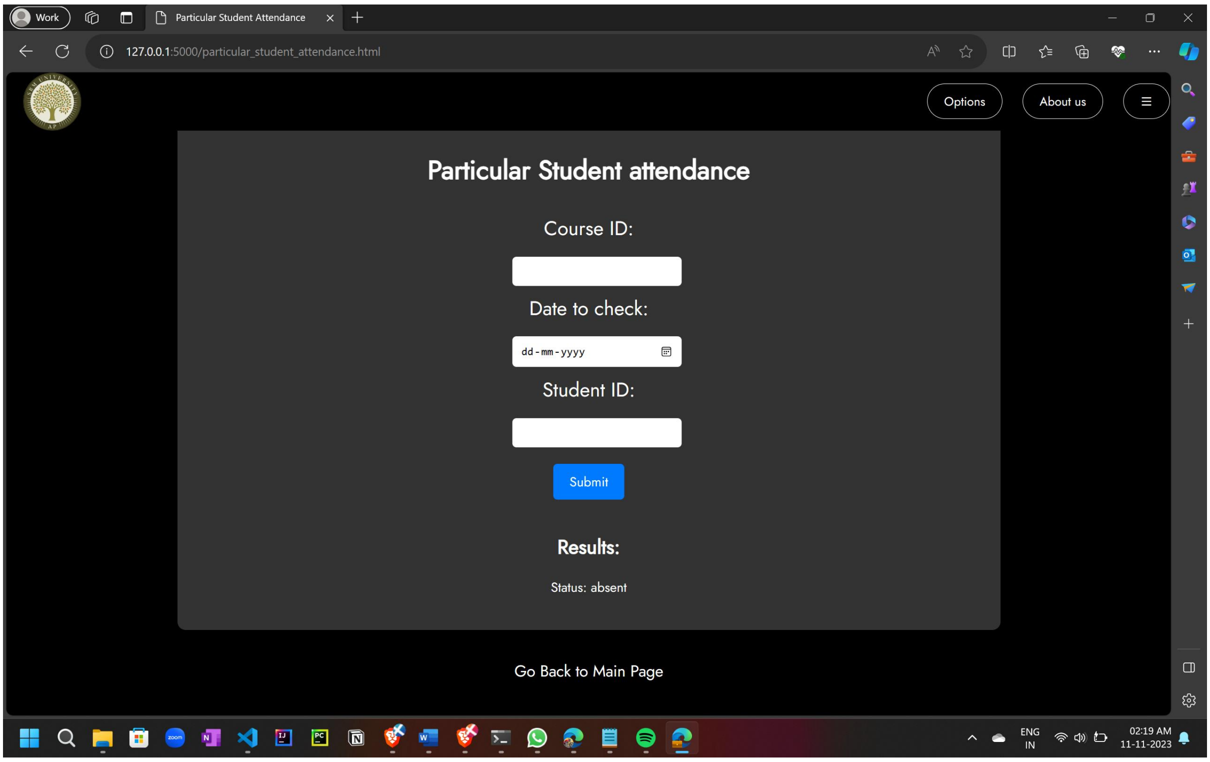
Month(MM):

Monthly Attendance Report

Student ID	Total Classes	Attended Classes	Attendance Percentage
AP21110011281	31	25	80.65%
AP21110011282	31	25	80.65%
AP21110011283	31	22	70.97%
AP21110011284	31	28	90.32%
AP21110011285	31	28	90.32%
AP21110011286	31	23	74.19%

ENG
IN
02:18 AM
11-11-2023

7. Check the attendance of a student


Work
Particular Student Attendance
127.0.0.1:5000/particular_student_attendance.html
Options
About us
02:19 AM
11-11-2023

Particular Student attendance

Course ID:

Date to check:

dd-mm-yyyy

Student ID:

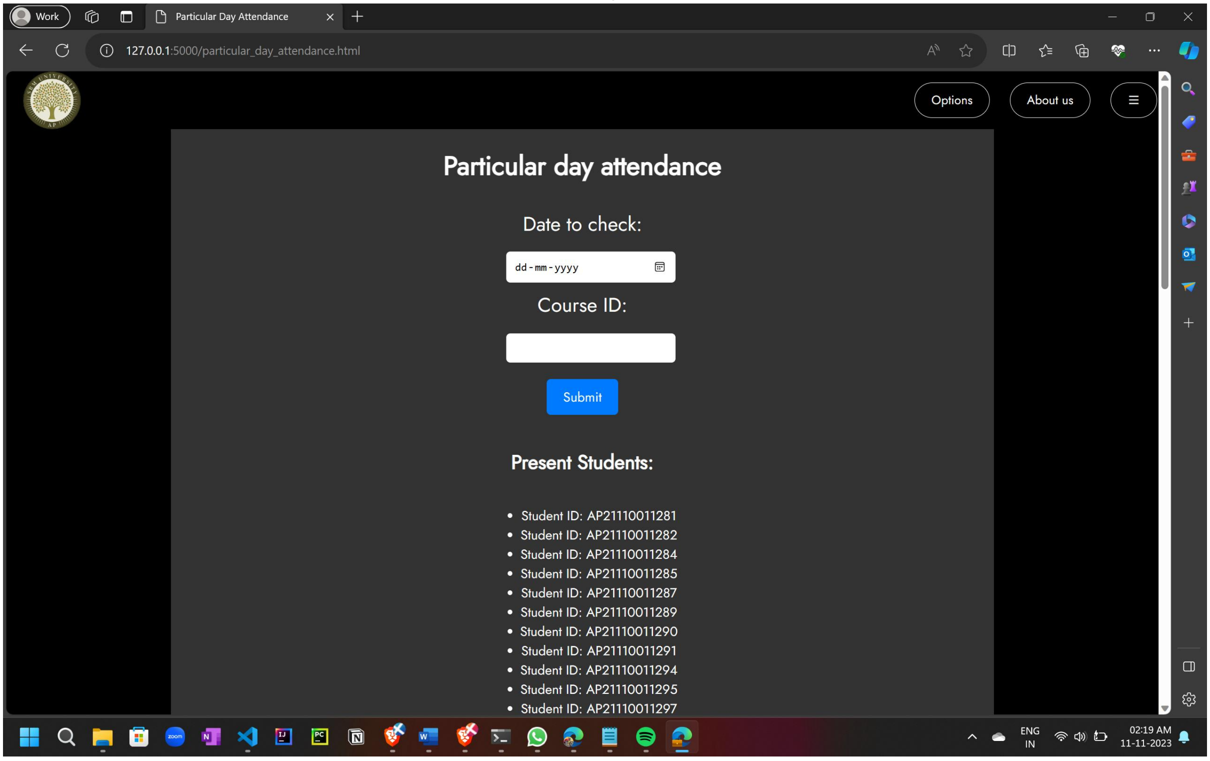
Submit

Results:

Status: absent

Go Back to Main Page

8. Attendance report of a particular day


Work
Particular Day Attendance
127.0.0.1:5000/particular_day_attendance.html
Options
About us
02:19 AM
11-11-2023

Particular day attendance

Date to check:

dd-mm-yyyy

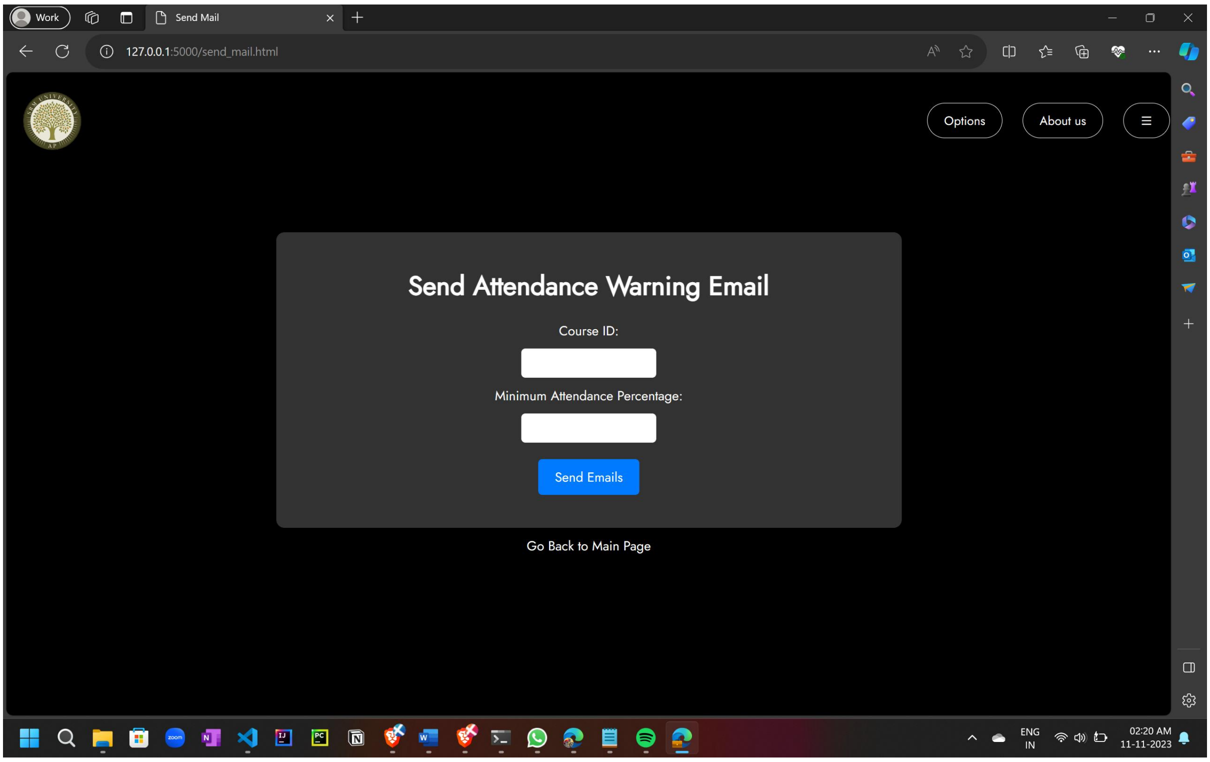
Course ID:

Submit

Present Students:

- Student ID: AP21110011281
- Student ID: AP21110011282
- Student ID: AP21110011284
- Student ID: AP21110011285
- Student ID: AP21110011287
- Student ID: AP21110011289
- Student ID: AP21110011290
- Student ID: AP21110011291
- Student ID: AP21110011294
- Student ID: AP21110011295
- Student ID: AP21110011297

9. Send alert mails

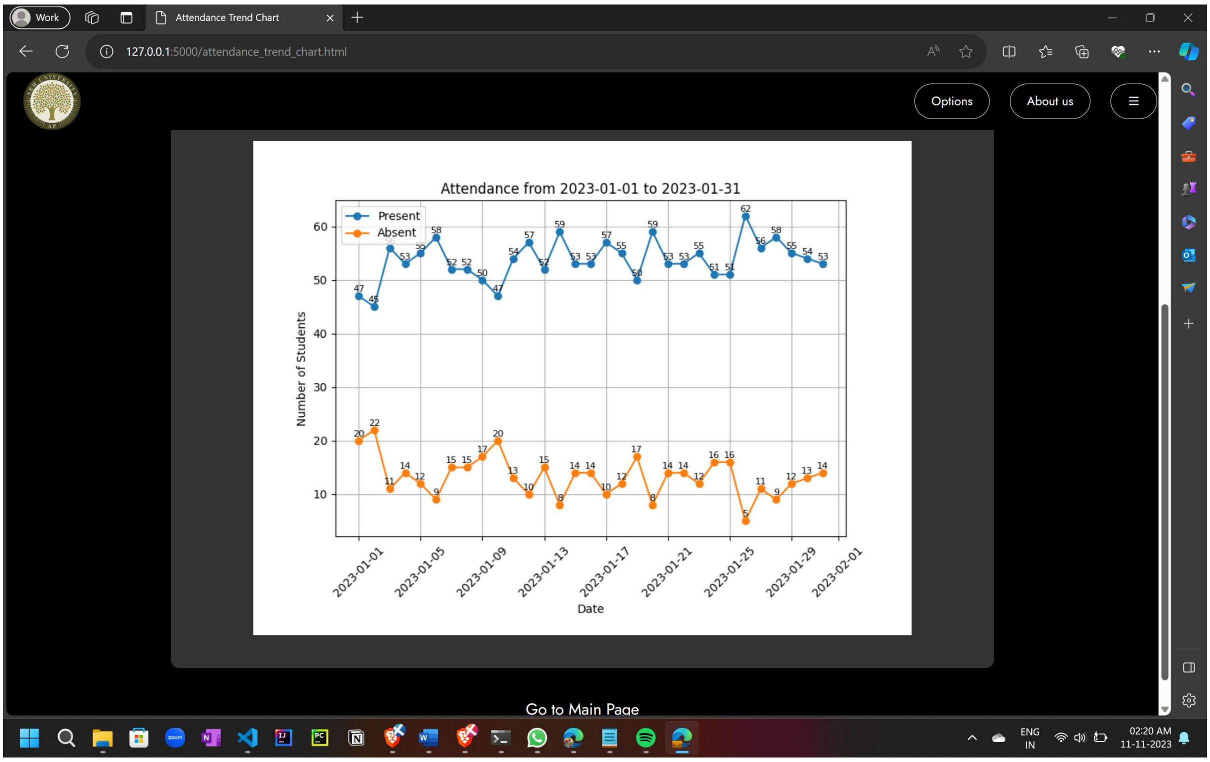


Send Attendance Warning Email

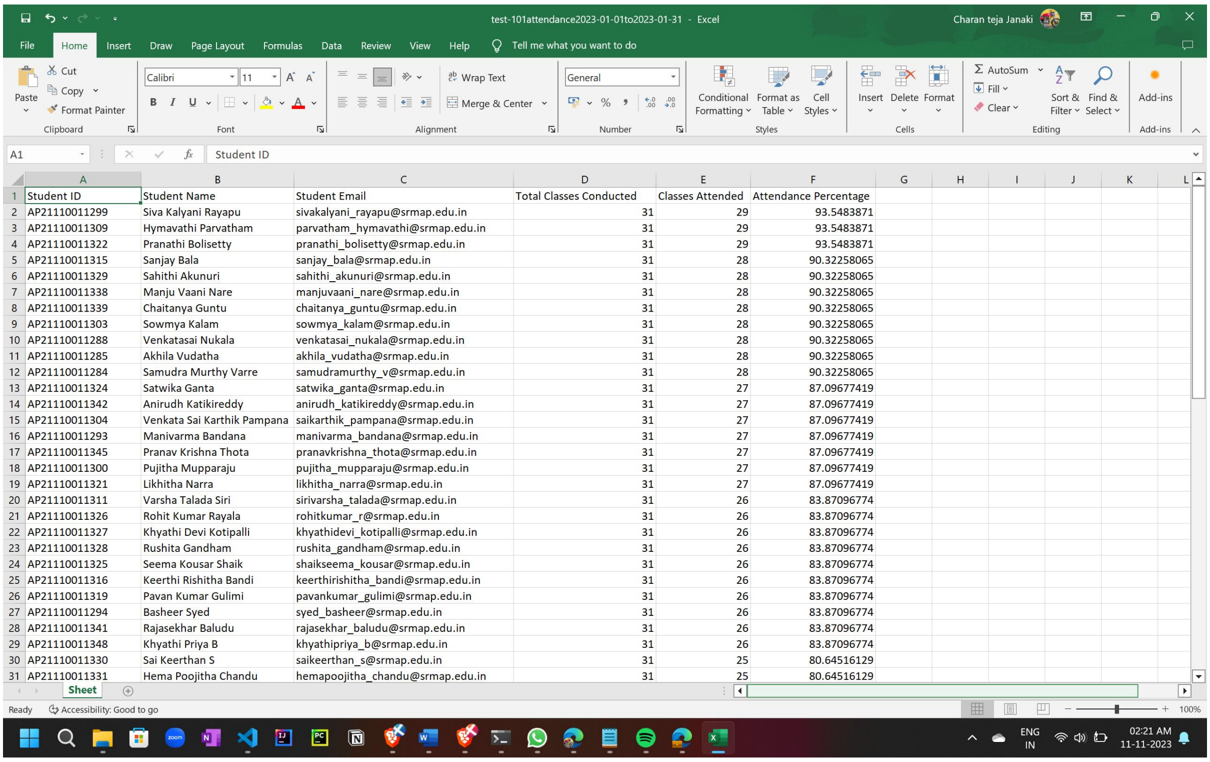
Course ID:

Minimum Attendance Percentage:

10. Attendance Trend chart



11.Get Attendance details in Excel format



	A	B	C	D	E	F
1	Student ID	Student Name	Student Email	Total Classes Conducted	Classes Attended	Attendance Percentage
2	AP21110011299	Siva Kalyani Rayapu	sivakalyani_rayapu@srmap.edu.in	31	29	93.5483871
3	AP21110011309	Hymavathi Parvatham	parvatham_hymavathi@srmap.edu.in	31	29	93.5483871
4	AP21110011322	Pranathi Bolisetty	pranathi_bolisetty@srmap.edu.in	31	29	93.5483871
5	AP21110011315	Sanjay Bala	sanjay_bala@srmap.edu.in	31	28	90.32258065
6	AP21110011329	Sahithi Akunuri	sahithi_akunuri@srmap.edu.in	31	28	90.32258065
7	AP21110011338	Manju Vaani Nare	manjuvaani_nare@srmap.edu.in	31	28	90.32258065
8	AP21110011339	Chaitanya Guntu	chaitanya_guntu@srmap.edu.in	31	28	90.32258065
9	AP21110011303	Sowmya Kalam	sowmya_kalam@srmap.edu.in	31	28	90.32258065
10	AP21110011288	Venkatasai Nukala	venkatasai_nukala@srmap.edu.in	31	28	90.32258065
11	AP21110011285	Akhila Vudatha	akhila_vudatha@srmap.edu.in	31	28	90.32258065
12	AP21110011284	Samudra Murthy Varre	samudramurthy_v@srmap.edu.in	31	28	90.32258065
13	AP21110011324	Satwika Ganta	satwika_ganta@srmap.edu.in	31	27	87.09677419
14	AP21110011342	Anirudh Katikireddy	anirudh_katikireddy@srmap.edu.in	31	27	87.09677419
15	AP21110011304	Venkata Sai Karthik Pampana	saikarthik_pampana@srmap.edu.in	31	27	87.09677419
16	AP21110011293	Manivarma Bandana	manivarma_bandana@srmap.edu.in	31	27	87.09677419
17	AP21110011345	Pranav Krishna Thota	pranavkrishna_thota@srmap.edu.in	31	27	87.09677419
18	AP21110011300	Pujitha Mupparaju	pujitha_mupparaju@srmap.edu.in	31	27	87.09677419
19	AP21110011321	Likhitha Narra	likhitha_narra@srmap.edu.in	31	27	87.09677419
20	AP21110011311	Varsha Talada Siri	sirivarsha_talada@srmap.edu.in	31	26	83.87096774
21	AP21110011326	Rohit Kumar Rayala	rohitkumar_r@srmap.edu.in	31	26	83.87096774
22	AP21110011327	Khyathi Devi Kotipalli	khyathidevi_kotipalli@srmap.edu.in	31	26	83.87096774
23	AP21110011328	Rushita Gandham	rushita_gandham@srmap.edu.in	31	26	83.87096774
24	AP21110011325	Seema Kousar Shaik	shaikseema_kousar@srmap.edu.in	31	26	83.87096774
25	AP21110011316	Keerthi Rishitha Bandi	keerthirishitha_bandi@srmap.edu.in	31	26	83.87096774
26	AP21110011319	Pavan Kumar Gulimi	pavankumar_gulimi@srmap.edu.in	31	26	83.87096774
27	AP21110011294	Basheer Syed	syed_basheer@srmap.edu.in	31	26	83.87096774
28	AP21110011341	Rajasekhar Baludu	rajasekhar_baludu@srmap.edu.in	31	26	83.87096774
29	AP21110011348	Khyathi Priya B	khyathipriya_b@srmap.edu.in	31	26	83.87096774
30	AP21110011330	Sai Keerthan S	saikeerthan_s@srmap.edu.in	31	25	80.64516129
31	AP21110011331	Hema Poojitha Chandu	hemapoojitha_chandu@srmap.edu.in	31	25	80.64516129

Conclusion

The Smart Attendance Management System stands at the forefront of educational innovation, transcending its role as a mere technological solution to become a transformative force in the educational landscape. In essence, it is not just a system; it is a catalyst poised to revolutionize how educational institutions manage attendance, streamline operations, and foster a more engaged and productive learning environment.

By automating the traditionally cumbersome process of attendance tracking, the system liberates educators from administrative burdens, allowing them to redirect their focus toward what truly matters – effective teaching and student engagement. The integration of RFID technology and Flask-powered back-end ensures not only efficiency in data handling but also real-time insights into attendance patterns, facilitating informed decision-making for educators and administrators alike.

Beyond its technical capabilities, the Smart Attendance Management System embodies the essence of educational transformation. It aspires to cultivate an environment where students are not only accounted for but actively supported in their educational journey. The promise lies not just in the reduction of manual workload but in the enhancement of overall educational experiences, contributing to a more enriching and dynamic academic setting.

As the system seamlessly bridges the gap between technology and education, its successful implementation holds the potential to shape a brighter future for educational institutions and their stakeholders. It is not merely about automating processes; it is about creating a paradigm shift towards a more student-centric and efficient educational ecosystem. The Smart Attendance Management System is poised to be an integral part of this evolution, setting the stage for a new era in educational administration and student engagement.

Future Scope

This project involves several areas for potential improvement and expansion:

- Enhancing the user interface for a more interactive and user-friendly experience.
- Adding security features to protect sensitive attendance data.
- Implementing user authentication and role-based access control.
- Developing a mobile application for remote attendance tracking.
- Integrating data analytics for generating insightful reports.
- Modifying the schema of the database to provide appropriate views for the students

References

1. Grinberg, M. (2018). Flask Web Development: Developing Web Applications with Python. O'Reilly Media.
2. Finkenzeller, K. (2010). RFID Handbook: Fundamentals and Applications in Contactless Smart Cards, Radio Frequency Identification, and Near-Field Communication. John Wiley & Sons.
3. Dubois, P. (2008). MySQL Cookbook: Solutions for Database Developers and Administrators. O'Reilly Media.
4. Ramakrishnan, R., & Gehrke, J. (2003). Database Management Systems. McGraw-Hill.
5. Locomotive Scroll. (n.d.). GitHub Repository. Retrieved from https://github.com/locomotivemtl/locomotive-scroll
6. Date, C. J. (2003). An Introduction to Database Systems. Addison-Wesley.
7. Chodorow, K., & Dirolf, M. (2010). MongoDB: The Definitive Guide. O'Reilly Media.
8. Coronel, C., Morris, S., & Rob, P. (2016). Database Systems: Design, Implementation, & Management. Cengage Learning.