UNIVERSITY OF MALAYSIA TERENGGANU

FACULTY OF COMPUTER SCIENCE AND MATHEMATICS

COURSES : SYSTEM THINKING AND LOGIC CSF3023

PROGRAMME : BACHELOR OF COMPUTER SCIENCE (SOFTWARE ENGINEERING)

SESSION : SEMESTER 1 (2025/2026)

LECTURER'S NAME : PROFESSOR Ts. DATO' Dr. AZIZ DERAMAN

TITLE : ONLINE UNIVERSITY ATTENDANCE SYSTEM

NO GROUP : 4

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1. INTRODUCTION

1.1 Introduction of the System

Student attendance is one of the crucial parts in academic institutions. Lecturers and academic administrators rely on attendance records to monitor student participation, evaluate learning engagement, and ensure compliance with institutional requirements for coursework and examinations (Rashid, 2024). Attendance generally shows a reflection on a student's behavior, responsibility and commitment to their studies.

Most universities are still depending on traditional manual attendance registration methods such as paper and sheets or name call, even though attendance is often seen as the most important part. Manual attendance records are vulnerable to human error, loss of documents, and inaccurate record-keeping. There is also limited control over dishonest practices, such as proxy attendance, where students record attendance for absent peers (Sidek et al., 2016).

As student enrollment continues to grow and academic schedules become more structured, manual attendance management has proven to be increasingly inefficient. Previous research indicates that automated attendance systems can significantly improve record accuracy, reduce lecturers' administrative burden, and enable attendance data to be stored, retrieved, and managed more systematically (Rashid, 2024; Bakhri et al., 2025). Recent advancements in biometric technologies, particularly facial recognition, have attracted attention as a potential solution to further streamline the attendance process while minimizing the need for manual verification (Haris & Paidi, 2023).

Going against these obstacles, this project offers the solution, a modern attendance management system that simplifies and modernises the registration, storing and managing student attendance records. It hopes to help lecturers in managing attendance smoothly within the academic environment.

1.2 Project Background

In the past, attendance tracking mainly relied on manual registrations, handwritten signing sheets and name calls during class sessions are the main examples. While these approaches were once enough, they often resulted in inefficiencies such as disrupted limited class time and the teaching flow, misrecorded attendances, and difficulties in storing or retrieving records for reference in the future. These methods are easily damaged, misplaced or even manipulated which raises concerns about its integrity and accountability. Additionally, compiling attendance reports manually is time consuming and prone to inconsistency especially for large classes.

The IT field is moving fast and this has helped schools and other educational places get better and more reliable tools. They are using things like websites, computer systems and phones to do jobs. Now they have ways to check people's identities like using special scans QR codes and ID cards, which are better and safer, than the old paper ways. The IT field has made all these new methods possible so schools can use IT to make things easier and more secure. By delivering a central online system to digitally log attendance data in real-time, securely store it, and effortlessly retrieve it by accredited individuals, this attendance system leverages these tech innovations. By swapping conventional methods with computerized processes, schools can boost clarity, lessen managerial issues, and uphold consistent execution of attendance protocols.

1.3 Purpose of the System

The main purpose of this university attendance system is to provide a practical and automated solution that makes the process of monitoring student attendance while improving data accuracy simpler and more reliable. By reducing reliance on manual input, the system minimizes human error and crucially shortens the time needed to record the attendance during classes. It also helps to prevent attendance fraud by implementing controlled and verifiable attendance systems.

The system is designed to support student's responsibility and academic awareness. Students can view their attendance records allowing them to always aware and checks on their participation in the class and to make any changes if their attendance drop below the needed attendance percentages.

The system provides structured reports and analysis that are used to identify and monitor class performances, and detect early warning signs of student's disengagement for the lecturers. Lastly, overall academic management can be upgraded by providing accurate data and improving its accountability.

2. FUNCTIONAL REQUIREMENTS

2.1 Description

Our teams have divided five main functional requirements specifically for Online University Attendance System that each of them will be transform into flowcharts and pseudocodes.

In the aspect of User Authentication and Role Management, the system checks for the presence of a person trying to log in. Through the system, it is required that each user be their identification step in the platform to guarantee that unauthorized access does not occur. A clear example of this is when the lecturers are required to enter their assigned username details and secret password as verification when signing into the online university portal.

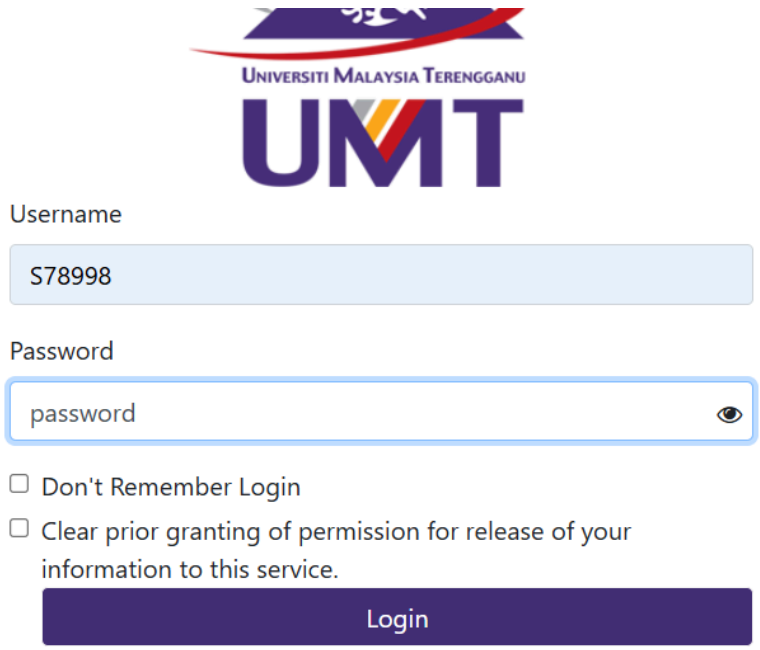


Figure 1 shows login page to access the system.

The overall idea of Role Management is to point out the permissions that have been allotted to each type of user on the platform. For example, the student can view their own attendance records, the teacher can take attendance and view details related to classes, whereas the administrator can handle courses, users, and settings of the platform.

Both User Authentication and Role Management must functions well to guarantee limited access for selected users, which will safeguard critical information and prevent damage to the attendance system.

Next, Course and Class Management system helps manage all the things that have to do with courses or classes. The people in charge like lecturers or administrators can make new courses, change courses or get rid of courses. They can also keep track of which student in each course, what the schedule is for the classes and how much time is set aside for the classes. The system knows which students are taking which courses and classes. The Course and Class Management system is really important, for keeping everything organized. Moreover, it assures the university's class schedule is displayed accurately on the online system, makes certain each student is assigned to the appropriate courses, and enables tracking of student attendance.

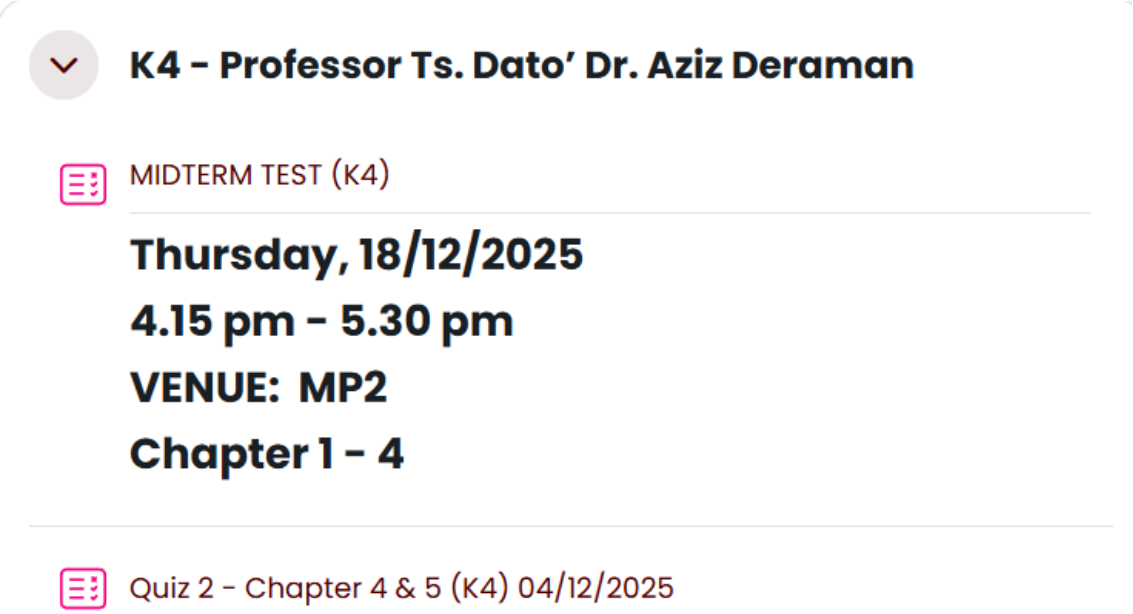


Figure 2 shows course and class management for each students .

When it comes to Attendance Recording, this indicates the system's ability to monitor each student's presence in every class session. As an example, lecturers have the option to manually record attendance or utilize methods such as scanning QR codes, digital sign in, or observing the participants in virtual class meetings. Every time attendance is recorded by a student, the system will automatically track the student's course on that time, which helps keep everything accurate. Not only that, the system also provides for control of late coming or absence with appropriate indication of status. This functionality ensures that the attendance information is accurate, reliable, and available for reporting and review which has great significance for academic monitoring and compliance with the university's regulations.

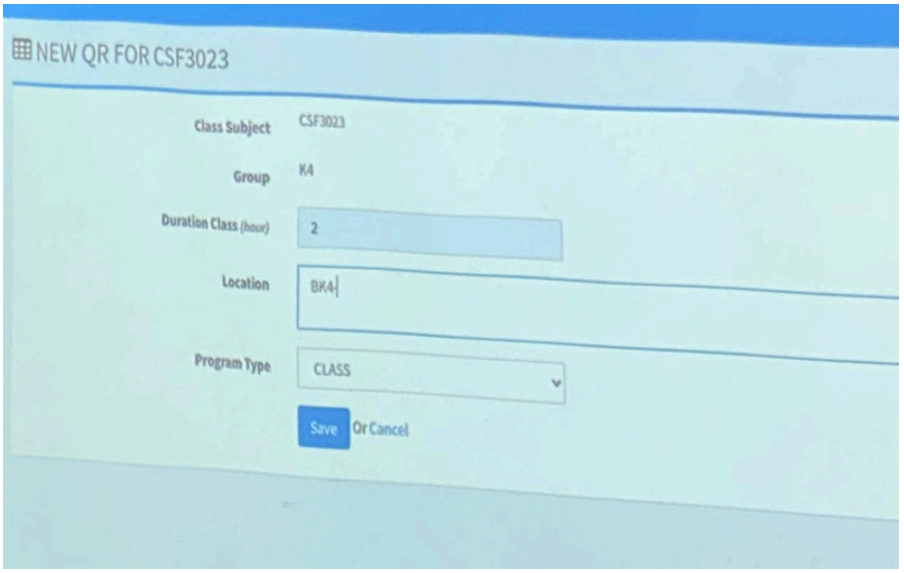
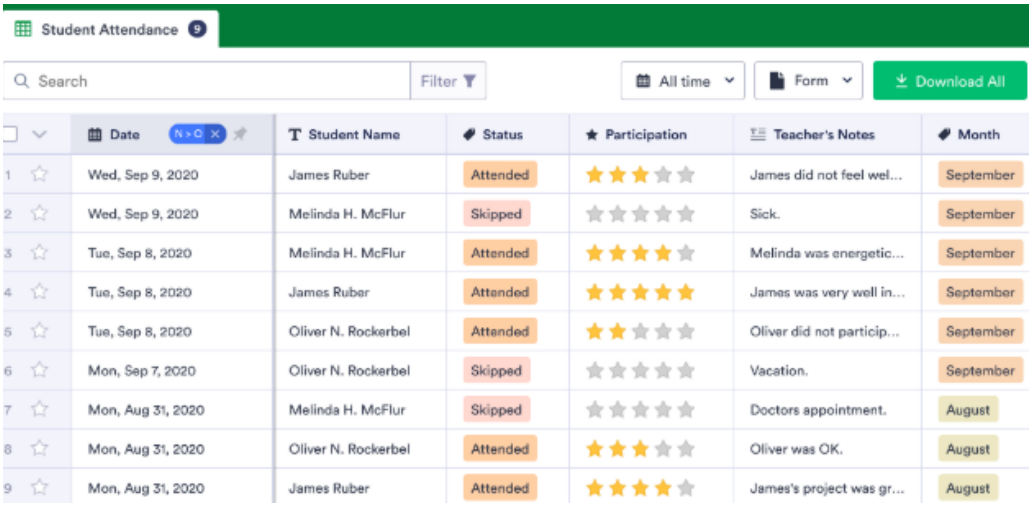


Figure 3 shows example of attendance recording through QR.

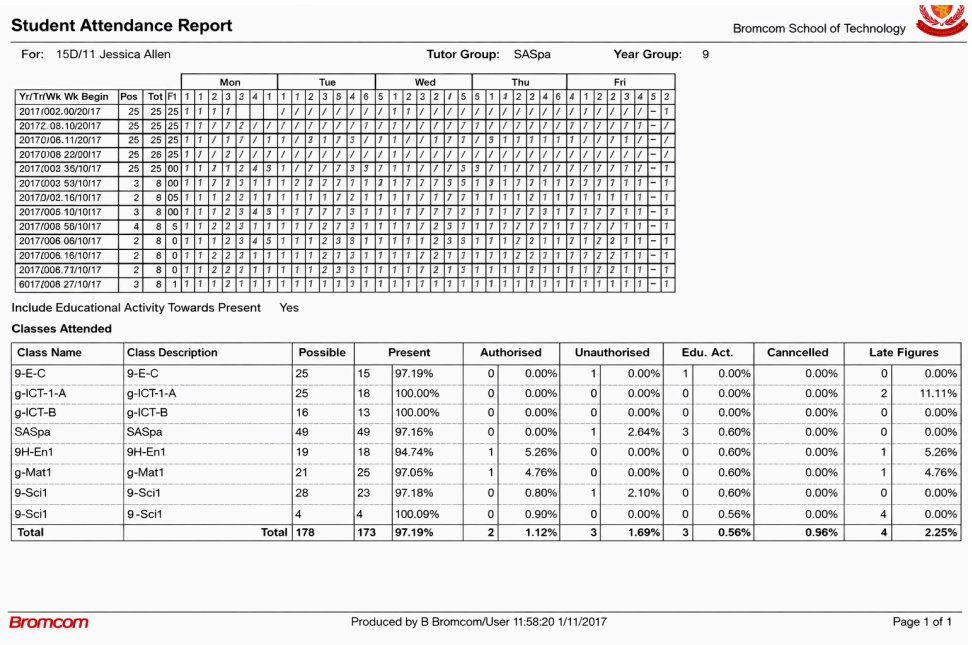
Attendance Viewing and Tracking will let instructors and administrators view a student's attendance history for analyzing missed class patterns and catching red flags that identify students who could be directly affected by missing classes. The views in the system are organized and can be filtered to analyze the attendance patterns by student, course, or date. We can facilitate academic integrity in staff and students through openness, accountability, and rapid monitoring.



	Date	Student Name	Status	Participation	Teacher's Notes	Month
1	Wed, Sep 9, 2020	James Ruber	Attended	★★★☆☆	James did not feel wel...	September
2	Wed, Sep 9, 2020	Melinda H. McFlur	Skipped	☆☆☆☆☆	Sick.	September
3	Tue, Sep 8, 2020	Melinda H. McFlur	Attended	★★★★☆	Melinda was energetic...	September
4	Tue, Sep 8, 2020	James Ruber	Attended	★★★★★	James was very well in...	September
5	Tue, Sep 8, 2020	Oliver N. Rockerbel	Attended	★★☆☆☆	Oliver did not particip...	September
6	Mon, Sep 7, 2020	Oliver N. Rockerbel	Skipped	☆☆☆☆☆	Vacation.	September
7	Mon, Aug 31, 2020	Melinda H. McFlur	Skipped	☆☆☆☆☆	Doctors appointment.	August
8	Mon, Aug 31, 2020	Oliver N. Rockerbel	Attended	★★★☆☆	Oliver was OK.	August
9	Mon, Aug 31, 2020	James Ruber	Attended	★★★★☆	James's project was gr...	August

Figure 4 shows the example of attendance tracking through the system.

The Attendance Reporting will help the system gather all the attendance information. It will show us the attendance in a way that's easy to understand, which is reported in terms of every day, every week or for the semester. Not only that, it can also make custom reports based on the student classes they are in and the courses they are taking. The attendance report then save these reports as an Excel file or a PDF file if we need to use them for management purposes. We can just look at them online anytime. Hence, this can be useful for teachers and authorities to observe patterns of attendance, detect abnormalities and make related deductions concerning performance in students or teaching techniques.



Student Attendance Report

Bromcom School of Technology

For: 15D/11 Jessica Allen **Tutor Group:** SASpa **Year Group:** 9

Yr/Tr/Wk Wk Begin	Pos	Tot	F1	Mon						Tue						Wed						Thu						Fri					
2017/002.00/20/17	25	25	25	1	1	1				/	/	/	/	/	/	1	1	/	/	/	/	/	/	/	/	/	/	/	/	/	/	–	1
20172.08.10/20/17	25	25	25	1	1	/	/	2	/	/	/	/	/	/	/	1	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	–	/
20170/06.11/20/17	25	25	25	1	1	/	1	/	/	1	1	/	3	1	/	3	/	1	1	/	/	1	1	/	3	1	1	1	1	1	/	/	/	1	/
20170/08 22/20/17	25	26	25	1	/	/	2	/	/	/	1	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	–	/
2017/003 36/10/17	25	25	00	1	1	1	2	4	5	1	/	7	7	7	3	7	1	1	/	/	7	3	3	7	1	7	7	7	7	7	7	7	7	–	1
2017/003 53/10/17	3	8	00	1	1	7	7	3	1	1	1	2	2	7	7	1	2	1	7	7	7	5	5	1	3	1	7	7	1	1	7	7	7	1	–	1
2017/002.16/10/17	2	8	05	1	1	1	2	2	1	1	1	1	1	7	2	1	1	1	1	7	7	2	1	1	1	1	1	2	1	1	1	1	1	1	–	1
2017/006.10/10/17	3	8	00	1	1	1	2	3	4	5	1	7	7	7	7	3	1	1	1	1	7	7	2	1	1	1	7	7	3	1	7	7	7	1	–	1
2017/008 56/10/17	4	8	5	1	1	2	2	3	1	1	1	1	7	2	7	3	1	1	1	1	7	7	2	5	7	1	1	7	7	7	7	7	1	1	–	1
2017/006.06/10/17	2	8	0	1	1	1	2	3	4	5	1	1	1	2	3	5	1	1	1	1	2	3	5	1	1	1	1	2	1	1	7	1	7	2	1	1	–	1
2017/006.16/10/17	2	8	0	1	1	2	2	2	1	1	1	1	1	2	7	3	1	1	1	1	7	2	1	7	1	1	7	2	7	1	7	7	7	2	1	1	–	1
2017/006.77/10/17	2	8	0	1	1	2	2	2	1	1	1	1	1	2	3	5	1	1	1	1	7	2	1	5	1	1	1	1	2	1	1	1	7	2	1	1	–	1
6017/008 27/10/17	3	8	1	1	1	1	2	1	1	1	1	1	1	1	1	3	1	1	1	1	7	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	–	1

Include Educational Activity Towards Present Yes

Classes Attended

Class Name	Class Description	Possible	Present		Authorised		Unauthorised		Edu. Act.		Canncelled	Late Figures	
9-E-C	9-E-C	25	15	97.19%	0	0.00%	1	0.00%	1	0.00%	0.00%	0	0.00%
g-ICT-1-A	g-ICT-1-A	25	18	100.00%	0	0.00%	0	0.00%	0	0.00%	0.00%	2	11.11%
g-ICT-B	g-ICT-B	16	13	100.00%	0	0.00%	0	0.00%	0	0.00%	0.00%	0	0.00%
SASpa	SASpa	49	49	97.16%	0	0.00%	1	2.64%	3	0.60%	0.00%	0	0.00%
9H-En1	9H-En1	19	18	94.74%	1	5.26%	0	0.00%	0	0.60%	0.00%	1	5.26%
g-Mat1	g-Mat1	21	25	97.05%	1	4.76%	0	0.00%	0	0.60%	0.00%	1	4.76%
9-Sci1	9-Sci1	28	23	97.18%	0	0.80%	1	2.10%	0	0.60%	0.00%	0	0.00%
9-Sci1	9-Sci1	4	4	100.09%	0	0.90%	0	0.00%	0	0.56%	0.00%	4	0.00%
Total	**Total**	**178**	**173**	**97.19%**	**2**	**1.12%**	**3**	**1.69%**	**3**	**0.56%**	**0.96%**	**4**	**2.25%**

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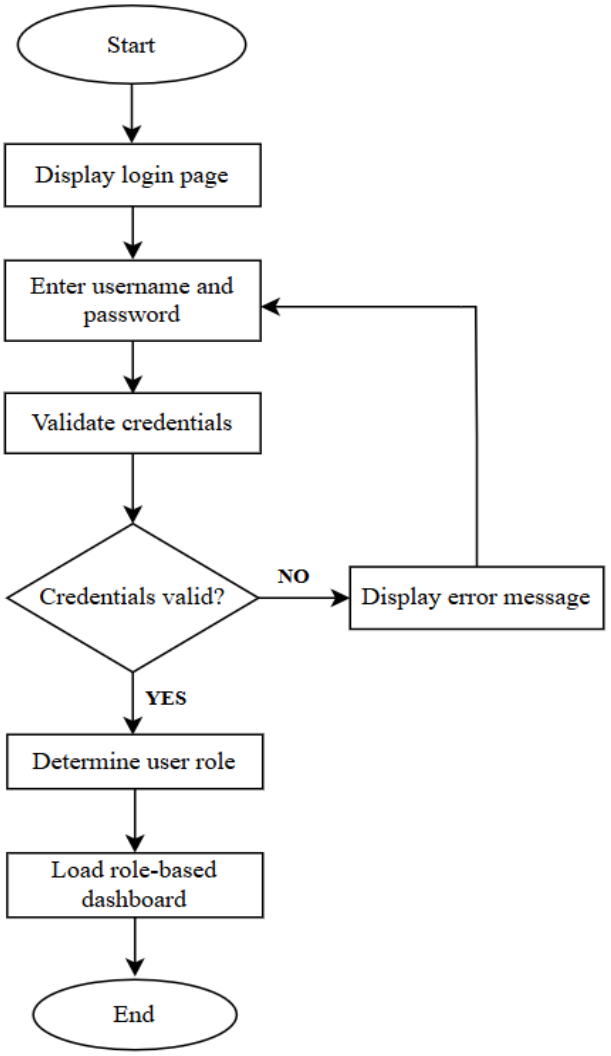
Figure 5 shows that the example of attendance report in PDF file.

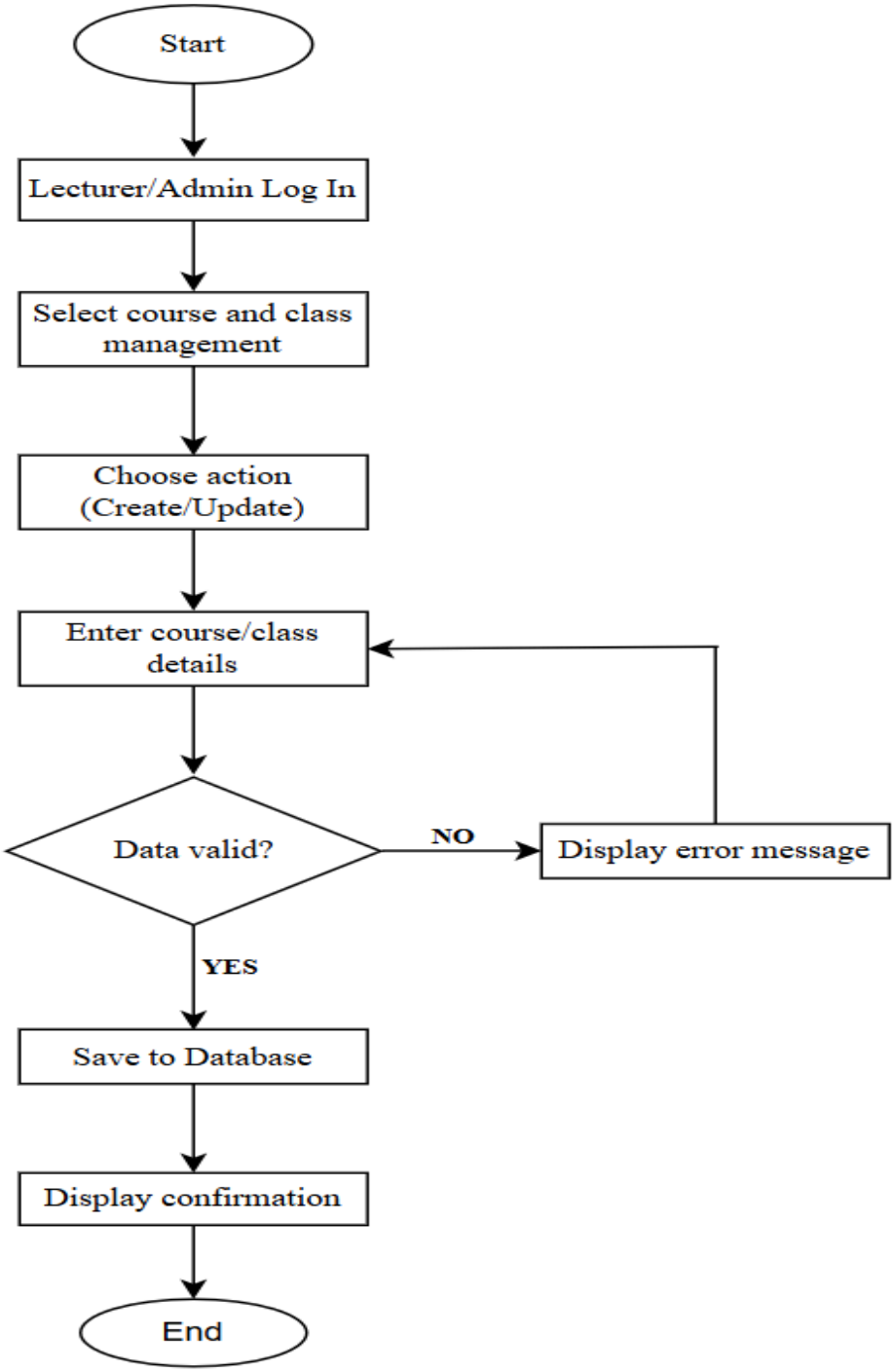
2.2 FLOWCHARTS AND PSEUDOCODES

Flowcharts:

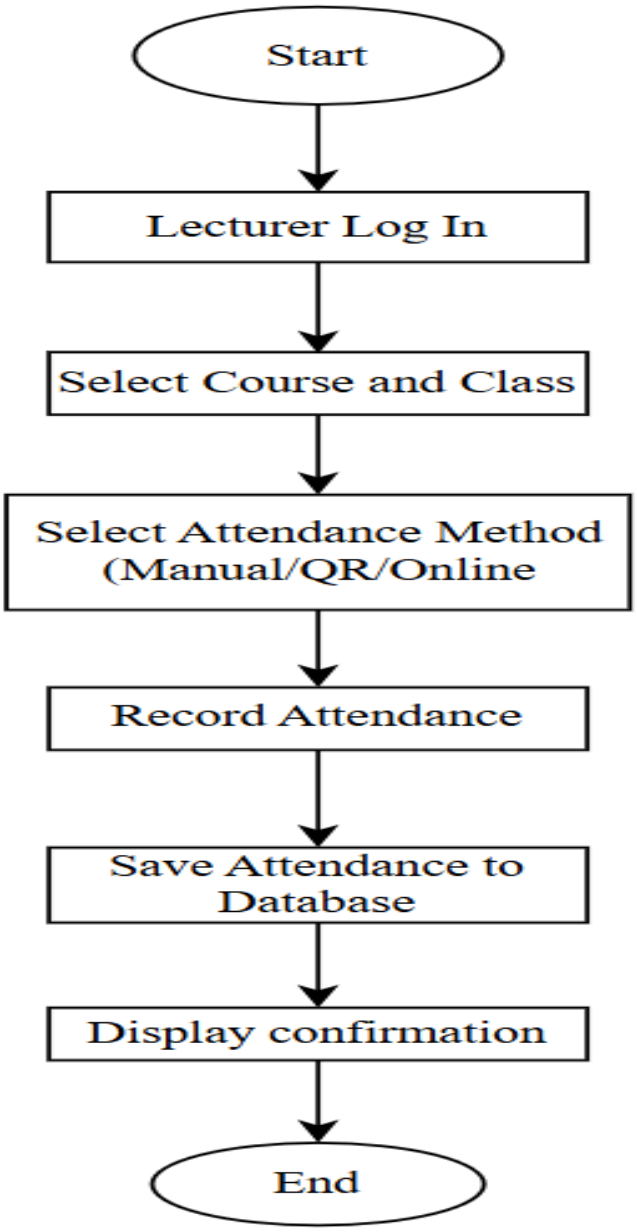
1. User Authentication and Authorization



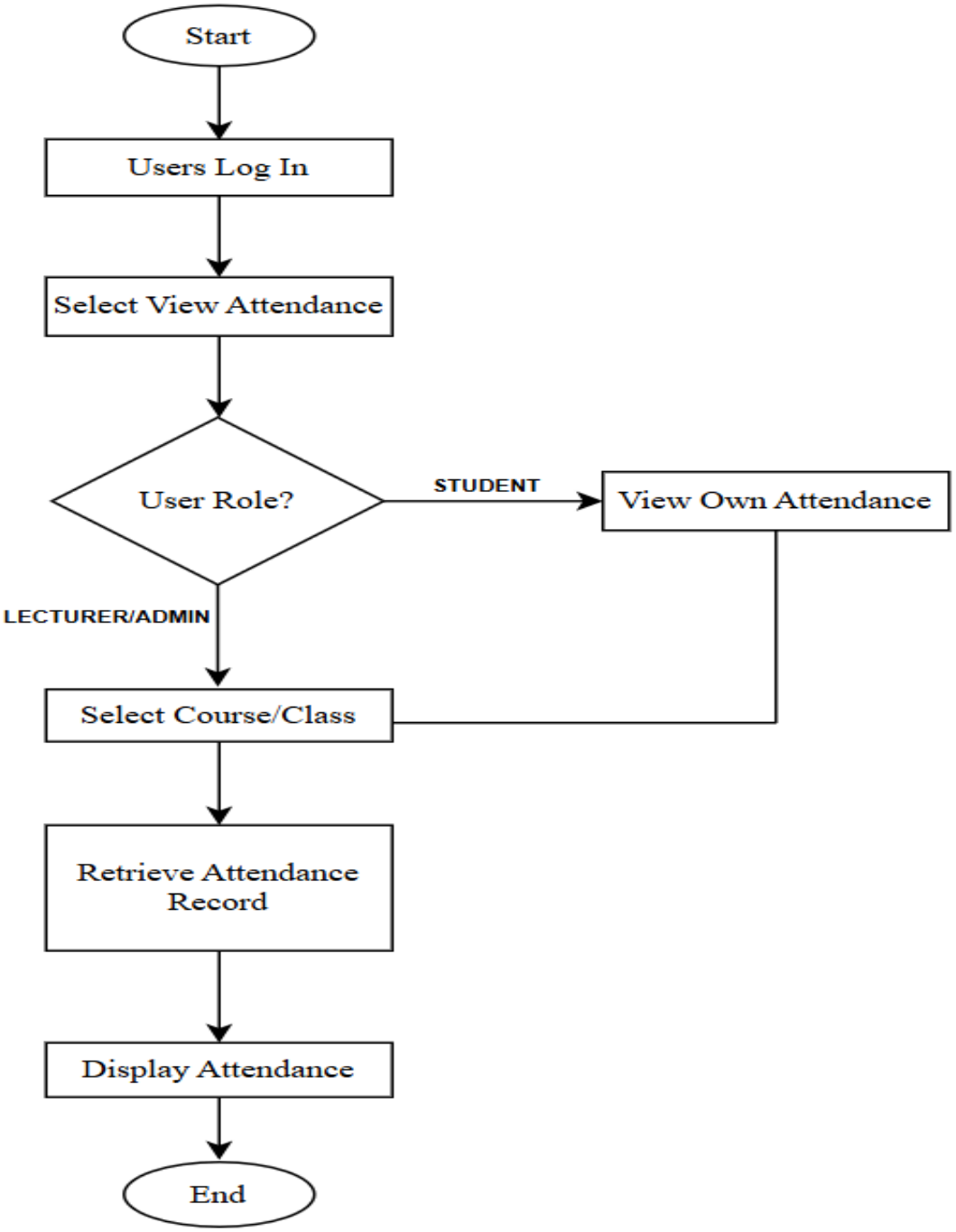
2. Course and Class Management



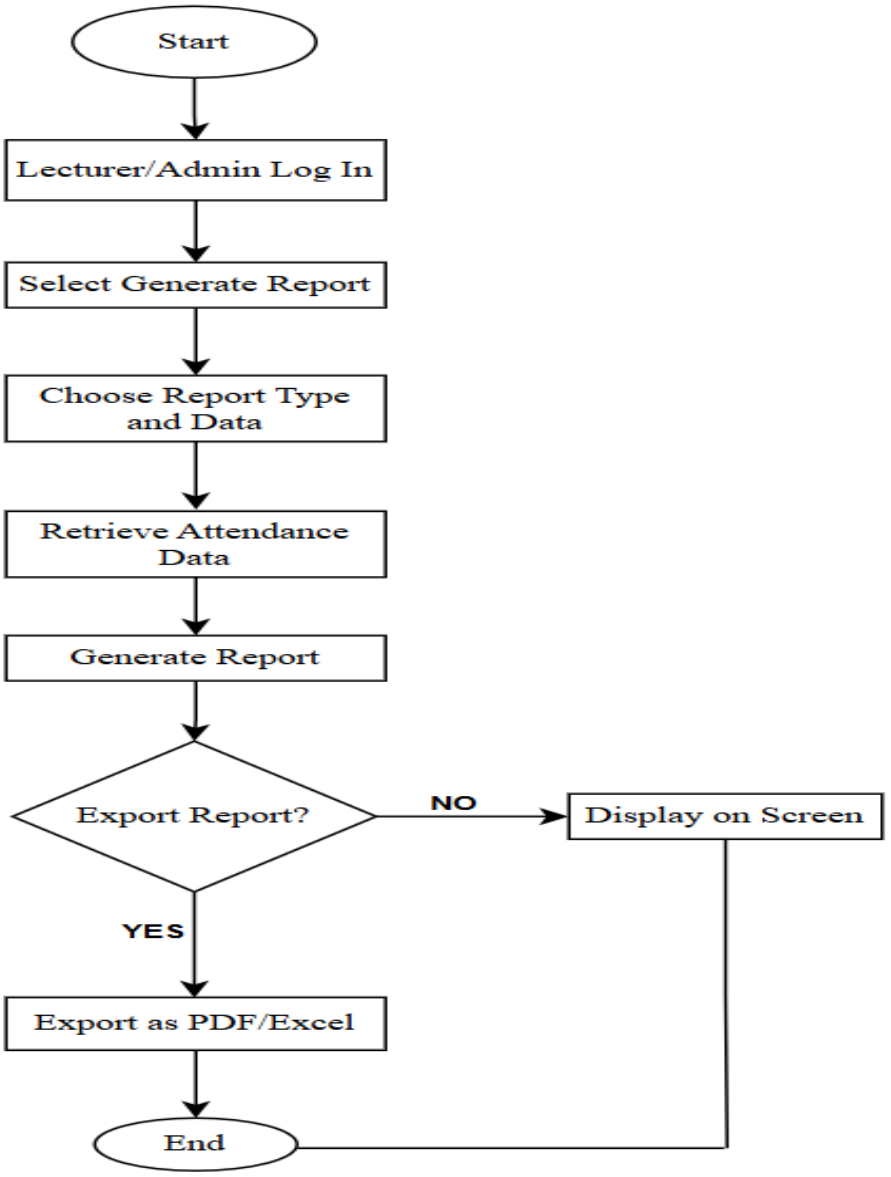
3. Attendance Recording



4. Attendance Viewing and Tracking



5. Attendance Report Generation



Pseudocodes:

1.User Authentication and Authorization

```
START
DISPLAY
DO
    PROMPT user to username and password
    VALIDATE entered credentials

    IF credentials are valid THEN
        DETERMINE user role
        LOAD dashboard based on role
        SET login_success = TRUE
    ELSE
        DISPLAY error message
        SET login_success = FALSE
    ENDIF

WHILE login_success = FALSE
END
```

2.Course and Class Management

```
START
Lecture/Admin logs in
SELECT course and class management
CHOOSE action (create or update)
REPEAT
    ENTER course/class details
    VALIDATE entered data

    IF data is valid THEN
        SAVE data to database
        DISPLAY confirmation message
        SET process_complete = TRUE
   ELSE
        DISPLAY error message
        SET process_complete = FALSE
  END IF

UNTILL process_complete = TRUE
END
```

3. Attendance Recording

```
START
Lecturer logs in
SELECT course and class
SELECT attendance method
    (Manual OR QR code OR Online)
RECORD student attendance
SAVE attendance data to database
DISPLAY confirmation message
END
```

4. Attendance Viewing and Tracking

```
START

User logs in
SELECT view attendance option
DETERMINE user role

IF user role = Student THEN
    RETRIEVE student's own attendance record
    DISPLAY attendance
ELSE IF user role = Lecturer OR Admin THEN
    SELECT course and class
    RETRIEVE attendance records
    DISPLAY attendance
ENDIF

END
```

5. Attendance Report Generation

```
START

Lecturer/Admin logs in
SELECT generate report option
CHOOSE report type and required data
RETRIEVE attendance data from database
GENERATE attendance report
ASK user whether to export report

IF user chooses YES THEN
    EXPORT report as PDF or Excel
ELSE
    DISPLAY report on screen
ENDIF

END
```

3. REFERENCES

1. Bakhri, F., Ekhsan, H. M., & Hamid, J. N. (2025). *Students' attendance monitoring system with SMS notification. Journal of Computing Research and Innovation, 5(1).* https://ir.uitm.edu.my/id/eprint/43550/

2. Rashid, A. M. (2024). *Smart campus: A review on smart attendance systems as an efficient approach. Journal of Engineering & Technological Advances, 8(2).* https://doi.org/10.35934/segi.v8i2.85

3. Sidek, N. Z. B. M., Salim, S., Abdul Salam, A., Ismail, M. Z., & Abdul Jamil, M. M. A. (2016). *Attendance tracking system based on contactless smartcard. Journal of Engineering Technology, 4(1), 27–35.* https://ejournal.unikl.edu.my/index.php/jet/article/view/255

4. Haris, S. A., & Paidi, Z. (2023). *Student attendance system using facial recognition based on deep learning. In Research Exhibition in Mathematics and Computer Sciences (REMACS 5.0) (pp. 271–272).* https://ir.uitm.edu.my/id/eprint/100836/