ASSIGNMENT TITLE: ONLINE UNIVERSITY ATTENDANCE SYSTEM

CSF3023: SYSTEM THINKING AND LOGIC

COMPUTER SCIENCE (SOFTWARE ENGINEERING)

SUBMITTED TO: PROF. TS. DATO' DR. AZIZ DERAMAN

MEMBER'S NAME	MATRIC NUMBERS
MUHAMMAD AMMAR HASREEN BIN MOHD RAMLI	S79627
NIFAEL ZULMAJDIE BIN SAIFUL SHAHRIZAL	S79633
HUDA BINTI ROSNI	S79649
MUHAMMAD IHSAN HAFIZI BIN MOHD ZAHARI	S79653

TABLE OF CONTENT

Introduction

A student attendance management system is a digital solution designed to capture, monitor, and report student attendance across various learning environments (Marianne David, August 13, 2025). Attendance is important for any academic institution, as it is used to determine how engaged students are in class, monitor student attendance or behavior towards the teacher, and maintain student discipline. Managing student attendance during lecture periods has become a difficult challenge (Shahab Zebari, February 2018). Traditionally, a manual sign-in sheet, roll call, or paper register is used for tracking student attendance. The inefficiency of this approach is that it is very time-consuming for the lecturer, as they have fixed hours, and there is a risk of errors since a student could accidentally mark another's work.

These limitations indicate that it lacks structural logical control since there are no clear rules or validations in it. Logical thinking can easily be applied to an online attendance system. These include user authentication to verify attendance, recording of attendance by lecturers to mark attendance, student attendance check-in, viewing attendance, and generating reports. These steps increase accuracy, reduce human error, and are simple to use.

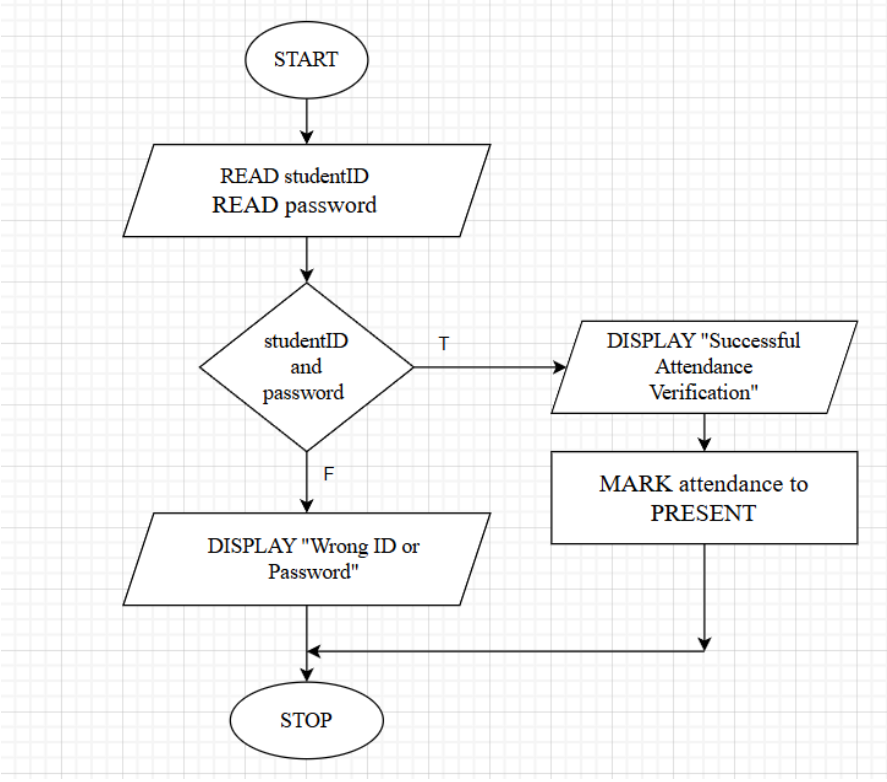
Functional Requirement 1 - User Authentication

User authentication refers to the process of verifying the identity of a user attempting to gain access to a computer network, system, or device (Awati, 2024). This function allow user to enter their user ID and password for authentication to verify their identity to access the system. It ensures that only authorized and registered users can use the system.

Pseudocode

```
1. START
2.      READ studentID
3.      READ password
4.          IF studentID and password are true THEN
5.              DISPLAY “Successful Attendance Verification.”
6.              MARK attendance to PRESENT
7.          ELSE
8.              DISPLAY “Wrong ID or Password.”
9.          ENDIF
10. END
```

Flowchart



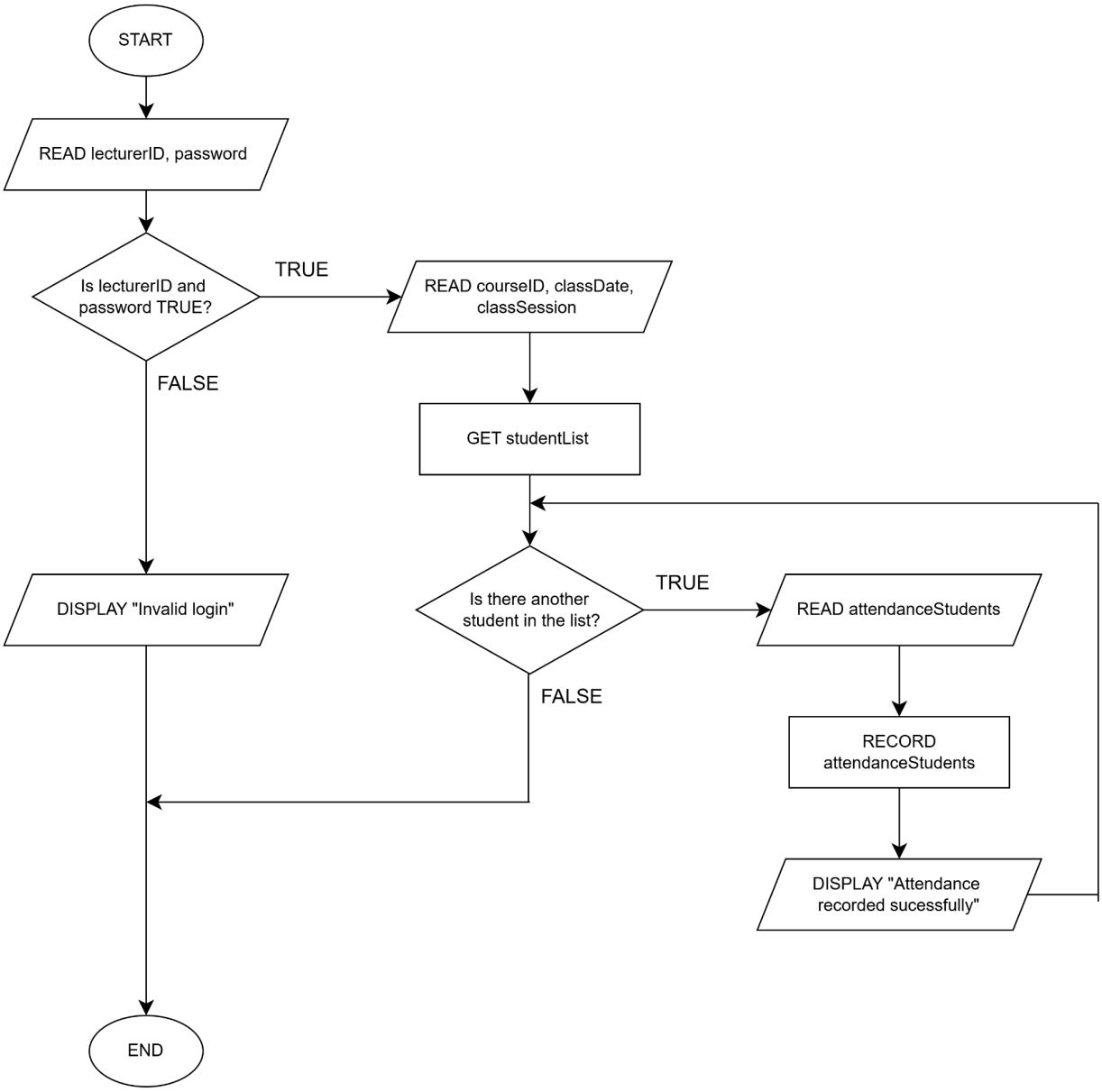
Functional Requirement 2 - Attendance Recording

This function allows the lecturer to initialize, manage, and record specific student attendance sessions. The lecturer can select the course, date, and class session, then mark students as present, absent, or late. All attendance data will be saved in the system database for future reference.

Pseudocode

1. START
2. READ lecturerID, password
3. IF lecturerID AND password are true THEN
    - 3.1 READ courseID, classDate, classSession
    - 3.2 GET studentList for courseID
    - 3.4 FOR each student in studentList
        - 3.4.1 READ attendanceStatus
        - 3.4.2 RECORD attendanceStatus
    - 3.5 END FOR
    - 3.6 DISPLAY "Attendance recorded successfully.”
4. ELSE
    - 4.1 DISPLAY “Invalid login.”
5. END IF
6. END

Flowchart


START
READ lecturerID, password
Is lecturerID and password TRUE?
TRUE
READ courseID, classDate, classSession
FALSE
GET studentList
DISPLAY "Invalid login"
Is there another student in the list?
TRUE
READ attendanceStudents
FALSE
RECORD attendanceStudents
DISPLAY "Attendance recorded sucessfully"
END

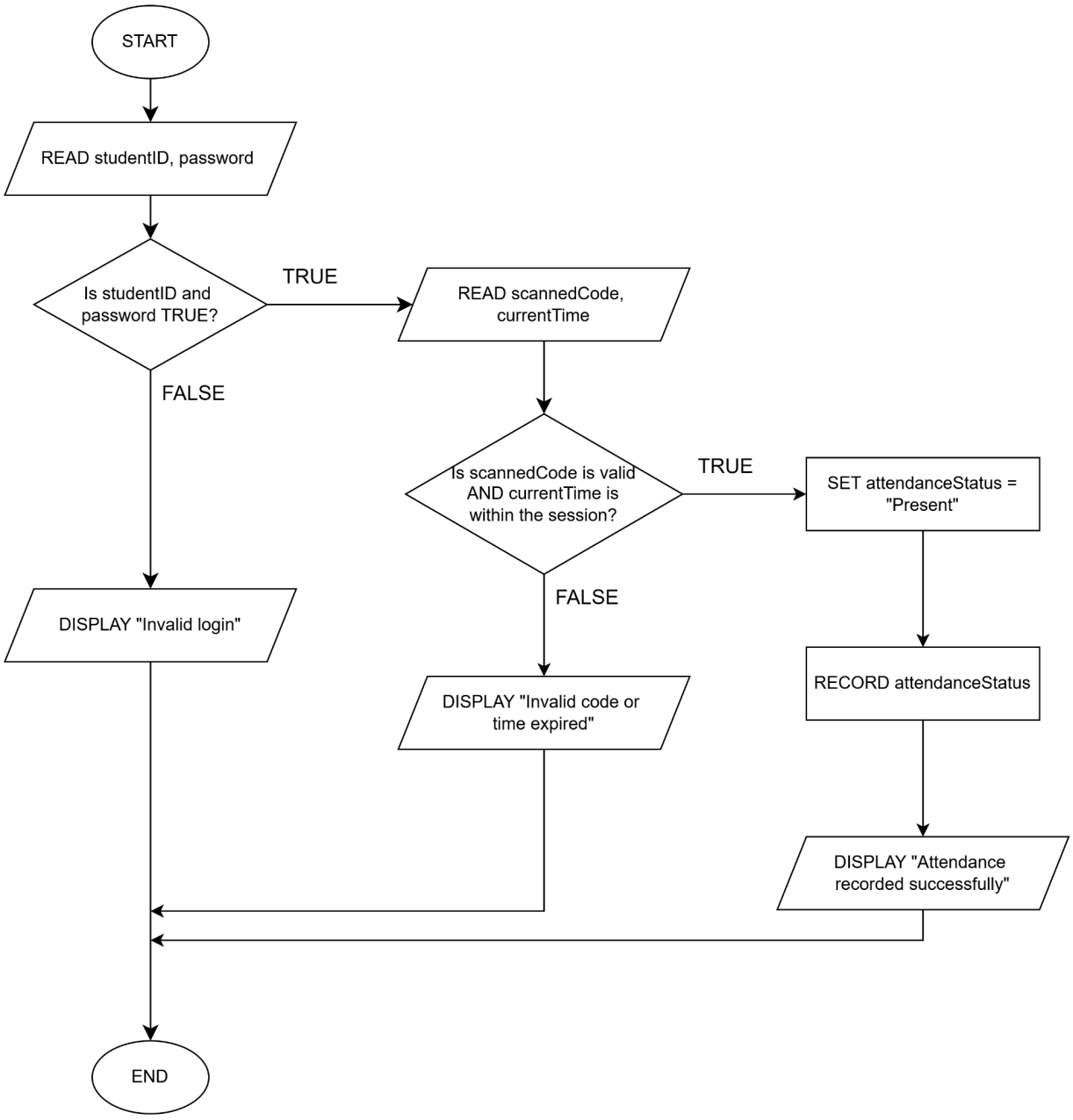
Functional Requirement 3 - Student Attendance Check-in

This function allows students to check in their attendance during the allowed class time. Students must be logged in and can only check in once per class session. The system will record the check-in time and update the attendance status automatically.

Pseudocode

1. START
2. READ studentID
3. READ password
4. IF studentID AND password are true THEN
    - 4.1 READ scannedCode, currentTime
    - 4.2 IF scannedCode is VALID AND currentTime IS WITHIN classSession THEN
        - 4.2.1 SET attendanceStatus = “Present”
        - 4.2.2 RECORD attendanceStatus FOR studentID
        - 4.2.3 DISPLAY “Attendance recorded successfully.”
    - 4.3 ELSE
        - 4.3.1 DISPLAY “Invalid code or time expired.”
    - 4.4 END IF
5. ELSE
    - 5.1 DISPLAY “Invalid login.”
6. END IF
7. END

Flowchart


START
READ studentID, password
Is studentID and password TRUE?
TRUE
FALSE
READ scannedCode, currentTime
Is scannedCode is valid AND currentTime is within the session?
TRUE
FALSE
SET attendanceStatus = "Present"
RECORD attendanceStatus
DISPLAY "Attendance recorded successfully"
DISPLAY "Invalid login"
DISPLAY "Invalid code or time expired"
END

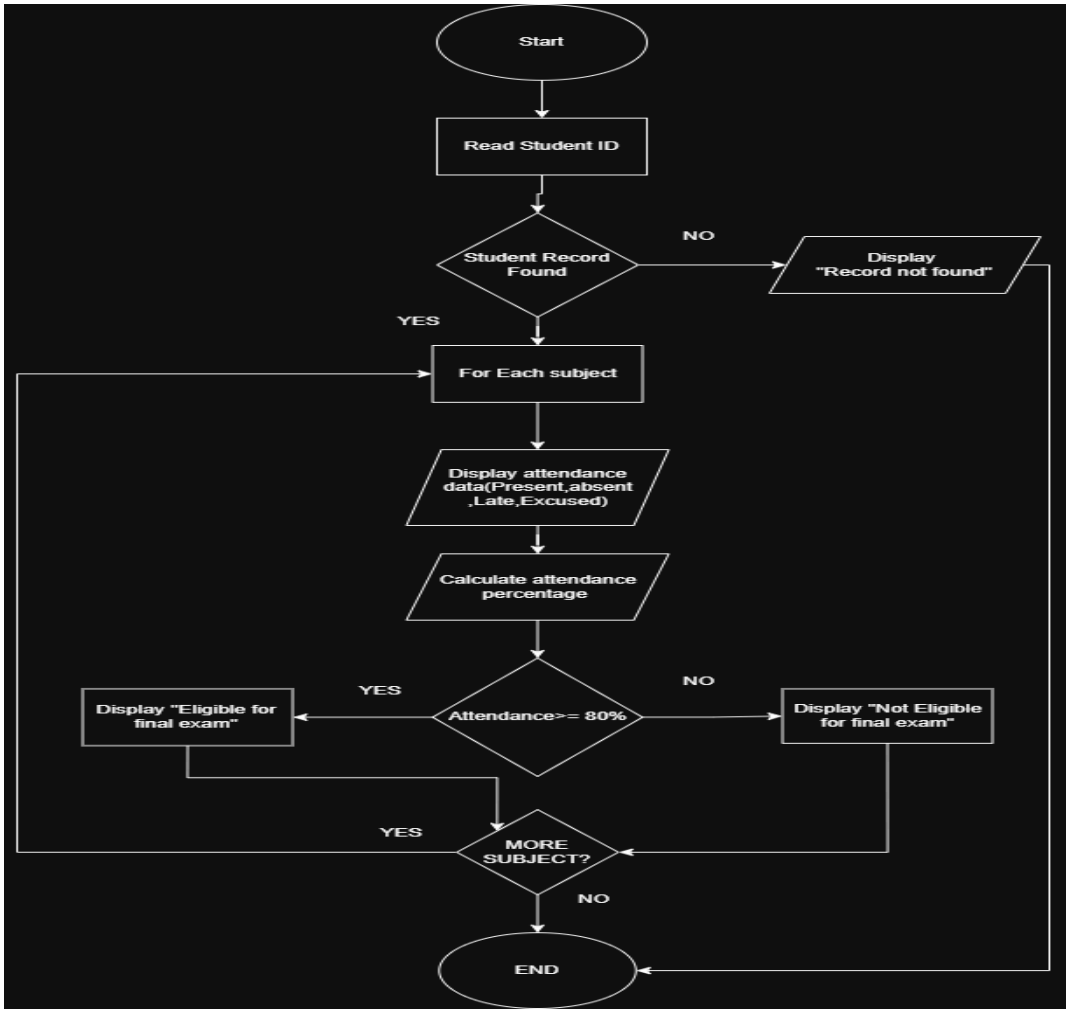
Functional Requirement 4 - Attendance Viewing

Attendance tracking for students is an element of a university or school's online platform that enables them to view and keep track of their attendance records for all the subjects they are enrolled in. This usually shows a summary of attendance percentages of all the subjects, accompanied by a record of dates marked as attended, absent, and late or excused from class. This is an important element of self-tracking that enables the student to confirm if the attendance is accurate and whether they have attained the 80% attendance necessary for a final examination.

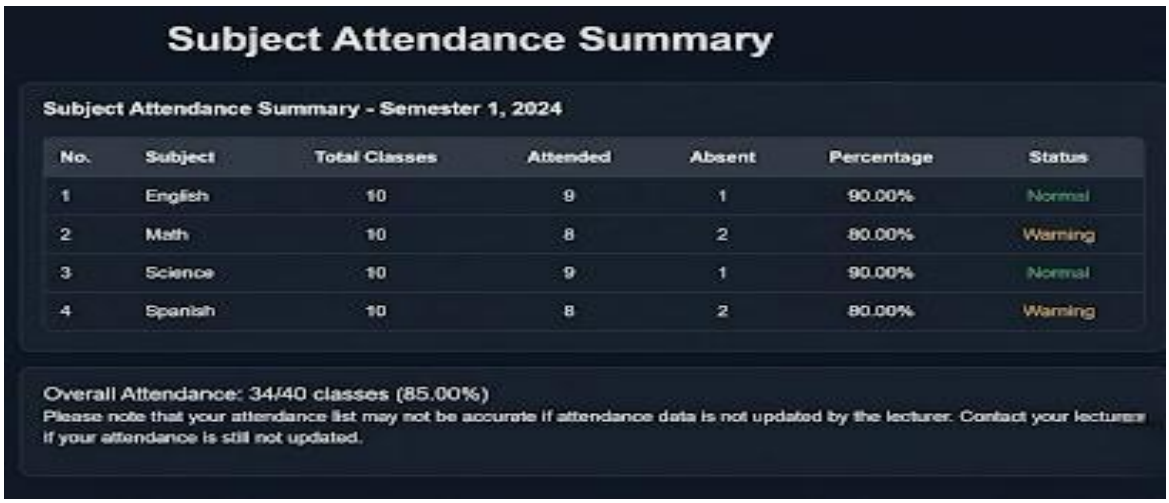
Pseudocode

```
1. Start
2. Input student ID
3. Retrieve StudentRecord using StudentID
4. If (StudentRecord ==exist) then
5.     For each subject in StudentRecord
6.         Display SubjectName
7.         Display ToralClasses
8.         Display ClassessAttended
9.         Display ClassesLate
10.        Display ClassesExcused
11. Attendance Perentage= (ClassesAttended/TotalClasses)*100
12. Display Attendance percentage
13. If (Attendance Percentage >= 80)Then
14.     Display “eligible for final Examination”
15. Else
16.     Display” Not eligible for final examination.”
17. End if
18. Display
19. AttendanceDates with Status
20. End for
21. Else
22. Display “Student Record not found.”
23. End if
24. End
```

Flowchart



Example of display:



Subject Attendance Summary

Subject Attendance Summary - Semester 1, 2024

No.	Subject	Total Classes	Attended	Absent	Percentage	Status
1	English	10	9	1	90.00%	Normal
2	Math	10	8	2	80.00%	Warning
3	Science	10	9	1	90.00%	Normal
4	Spanish	10	8	2	80.00%	Warning

Overall Attendance: 34/40 classes (85.00%)

Please note that your attendance list may not be accurate if attendance data is not updated by the lecturer. Contact your lecturer if your attendance is still not updated.

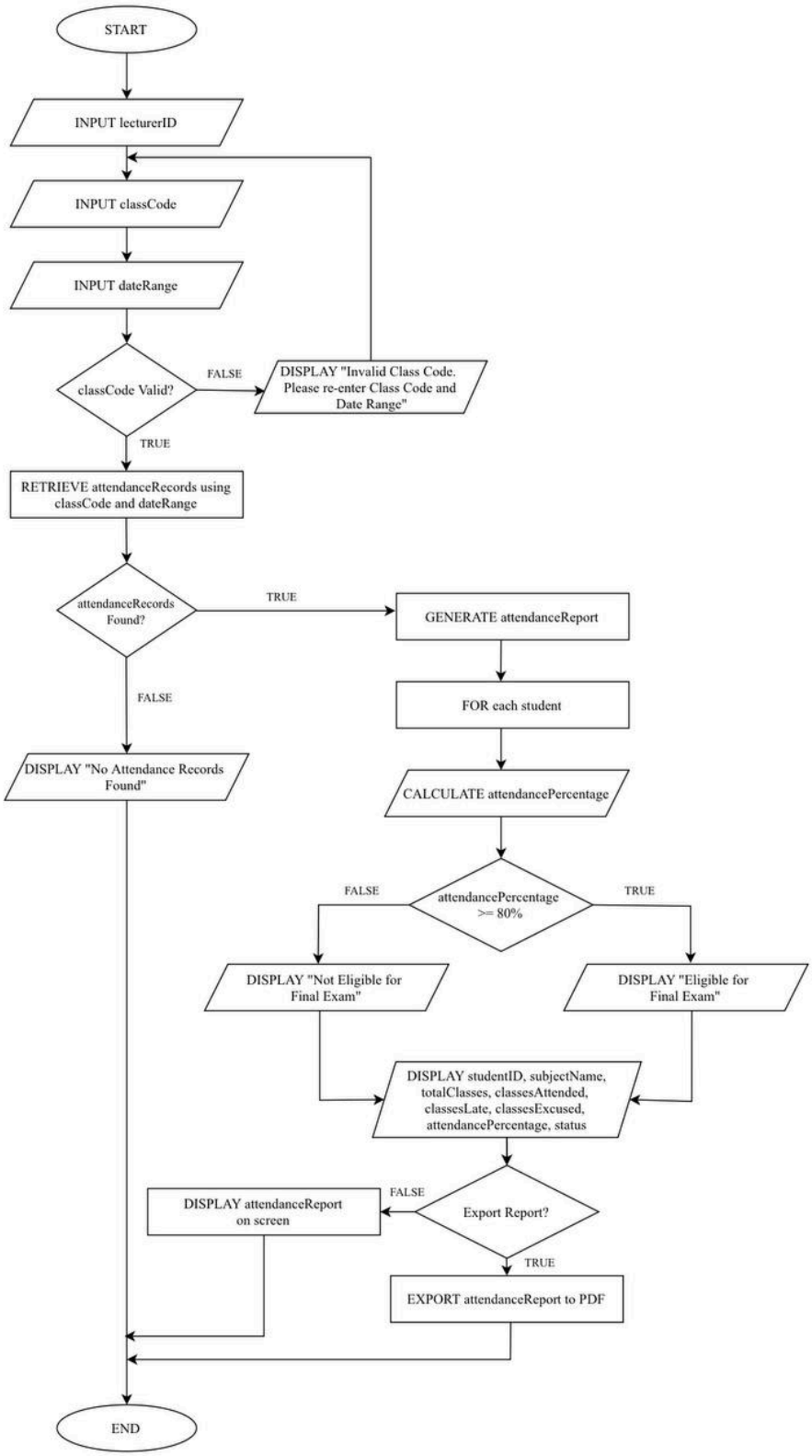
Functional Requirement 5 - Attendance Report Generation

The Attendance Report Generation feature allows lecturers or administrators to generate student attendance records for a selected class and date range. The lecturer enters their ID and class code, then selects the required date range. The system validates the class code before retrieving and filtering the relevant attendance data. If the attendance records are found, the system generates an attendance report; otherwise, an appropriate message is displayed. This feature helps lecturers to manage student attendance efficiently and reduces manual errors in record-keeping.

Pseudocode

```
START
    INPUT lecturerID
    INPUT classCode, dateRange
    WHILE classCode is NOT valid DO
        DISPLAY “Invalid Class Code. Please re-enter Class Code and Date Range”
        INPUT classCode, dateRange
    END WHILE
    RETRIEVE attendanceRecords using classCode and dateRange
    IF attendanceRecords are found THEN
        GENERATE attendanceReport
        FOR each student in attendanceRecords DO
          CALCULATE attendancePercentage = (classesAttended/totalClasses) * 100%
          IF attendancePercentage >= 80% THEN
            DISPLAY “Eligible for Final Exam”
          ELSE
            DISPLAY “Not Eligible for Final Exam”
          END IF
          DISPLAY studentID, subjectName, totalClasses, classAttended, classesLate,
          classesExcused, attendancePercentage, status
        END FOR
    IF export attendanceReport THEN
      EXPORT attendanceReport to PDF
    ELSE
      DISPLAY attendanceReport on screen
    END IF
    ELSE
        DISPLAY “No Attendance Records Found”
    END IF
END
```

Flowchart


START
INPUT lecturerID
INPUT classCode
INPUT dateRange
classCode Valid?
FALSE
DISPLAY "Invalid Class Code. Please re-enter Class Code and Date Range"
TRUE
RETRIEVE attendanceRecords using classCode and dateRange
attendanceRecords Found?
TRUE
GENERATE attendanceReport
FOR each student
CALCULATE attendancePercentage
FALSE
DISPLAY "No Attendance Records Found"
attendancePercentage >= 80%
FALSE
TRUE
DISPLAY "Not Eligible for Final Exam"
DISPLAY "Eligible for Final Exam"
DISPLAY studentID, subjectName, totalClasses, classesAttended, classesLate, classesExcused, attendancePercentage, status
Export Report?
FALSE
TRUE
DISPLAY attendanceReport on screen
EXPORT attendanceReport to PDF
END

REFERENCES

Awati, R. (2024, December 9). *What is user authentication?* TechTarget. https://www.techtarget.com/searchsecurity/definition/user-authentication

David, M. (2025, August 13). *Student attendance management system: Best practices and tools*. MiHCM. https://mihcm.com/resources/blog/student-attendance-management-system-best-practices-and-tools/

Jacksi, K., Mohammed, F. H., & Zebari, S. (2018). *Student attendance management system*. *Scholars Journal of Engineering and Technology, 6*(2), 49–53. https://www.researchgate.net/publication/323511629_Student_Attendance_Management_System

Scribd. (n.d.-b). Students attendance management system da. Scribd. https://www.scribd.com/document/508780966/Students-Attendance-Management-System-Da