A
Project Report
On

"Attendance System Using QR"

By
Dasnur Prashant Ghevarchand

Under the guidance of
Prof. S. S. Bonde

Department of Computer Science

K. S. K. W. Arts, Science and Commerce College, Cidco, Nashik

Year 2022-23

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Maratha Vidya Prasarak Samaj's

K.S.K.W. Arts, Science & Commerce College, Cidco.

Uttam Nagar, Nasik-8 Phone: (0253) 2391110

Email: cidcocollegenasik@rediffmail.com Principle: Mr. S.K. Kushare

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CERTIFICATE

This is to certify that the Project entitled

Attendance System Using QR

has been successfully completed by

Dasnur Prashant Ghevarchand

in partial fulfilment of the requirements for Project (CS –3611) Sem. –VI of B. Sc. (Computer Science), under graduate degree to Savitribai Phule University for the academic year 2022-2023.

SBonde .
Project Guide

SBonde .
Head of the Department

Patil
External Examiner

SBonde
26/7/23
Internal Examiner

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ABSTRACT

The rapid advancement of technology has revolutionized various aspects of our lives, including attendance management systems. Traditional methods for recording attendance often suffer from inaccuracies, time inefficiencies, and vulnerability to fraudulent practices. In this context, the utilization of QR (Quick Response) codes has emerged as a promising solution to streamline the attendance process, ensuring accuracy, efficiency, and enhanced security.

This abstract presents an overview of a QR code-based attendance system designed to automate and optimize the attendance tracking process. The system leverages the ubiquity of smartphones equipped with QR code scanning capabilities. Each student or participant is assigned a unique QR code, which can be easily generated and printed. By utilizing a dedicated mobile application, attendees can quickly scan their individual QR codes upon arrival, enabling automatic and real-time recording of attendance data.

The proposed system offers numerous advantages. Firstly, it eliminates the need for manual entry, reducing the potential for human error. Additionally, the automated process saves time for both instructors and participants, enabling efficient utilization of class or event time. Moreover, the system enhances security by generating unique QR codes that are difficult to replicate, minimizing the risk of attendance fraud. The captured attendance data can be securely stored and accessed, providing valuable insights for attendance analysis and reporting purposes.

Furthermore, the QR code-based attendance system promotes seamless integration with existing data management systems. The attendance data can be easily synchronized with student databases, facilitating accurate record-keeping and simplifying administrative tasks. The system's scalability allows it to be implemented in various settings, such as educational institutions, corporate environments, conferences, and workshops.

In conclusion, the QR code-based attendance system offers a robust and efficient solution to manage attendance effectively. By leveraging the power of QR codes and mobile technology, it eliminates the limitations of traditional attendance tracking methods, ensuring accuracy, efficiency, and security. The system presents a valuable tool for organizations seeking to streamline their attendance processes and enhance overall operational effectiveness.

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Chapter 1

INTRODUCTION

The management of attendance is a critical aspect of various organizations, including educational institutions, workplaces, and events. Traditional methods of attendance tracking, such as manual sign-in sheets or swipe cards, often suffer from inefficiencies, inaccuracies, and susceptibility to fraudulent practices. In recent years, the emergence of QR (Quick Response) code technology has revolutionized the way attendance is recorded and managed. By leveraging the widespread use of smartphones equipped with QR code scanning capabilities, a QR code-based attendance system offers a more efficient, accurate, and secure approach.

The use of QR codes as a means of attendance tracking has gained popularity due to its simplicity and effectiveness. Each participant or student is assigned a unique QR code that serves as their digital identity. This code can be easily generated and printed, making it accessible to all attendees. When participants arrive at a class, event, or workplace, they can quickly scan their QR code using a dedicated mobile application. The system then automatically records their attendance, eliminating the need for manual entry and reducing the potential for errors.

The QR code-based attendance system brings numerous benefits to both administrators and participants. For administrators, the system offers streamlined and accurate attendance management. The automated process saves time and resources, allowing for better utilization of class or event time. Moreover, the system provides real-time attendance data, enabling immediate visibility into participant numbers and ensuring timely interventions if necessary. The captured attendance data can be securely stored and accessed, simplifying administrative tasks and facilitating reporting and analysis.

Participants also benefit from the QR code-based attendance system. The process of scanning QR codes is quick and hassle-free, minimizing disruptions and enhancing the overall user experience. Moreover, the system enhances security by generating unique QR codes that are difficult to replicate, reducing the risk of attendance fraud. Participants can have confidence in the accuracy and integrity of their attendance records.

1.1 Statement of the problem

Traditional methods of attendance tracking in various settings, such as educational institutions, corporate environments, conferences, and workshops, are often plagued by several challenges. These challenges include inaccuracies in manual data entry, time inefficiencies, and vulnerability to fraudulent practices. As a result, there is a need for an innovative and reliable attendance system that can address these issues and streamline the attendance management process.Manual Record-Keeping: Traditional manual processes for cataloging and managing library resources are time-consuming and prone to errors. Handwritten records, index cards, and manual filing systems often lead to misplaced or lost information, making it difficult to maintain an accurate inventory and retrieve materials efficiently

1. Inaccuracy and Human Error: Manual entry of attendance data is prone to errors, leading to discrepancies in record-keeping. Illegible handwriting, misinterpretation of names, or accidental omissions can result in unreliable attendance records.

2. Time Inefficiencies: Traditional attendance methods often consume significant amounts of time, both for instructors or administrators responsible for recording attendance and for participants waiting in line to sign in. These inefficiencies can disrupt the flow of classes or events and waste valuable instructional time..

3. Limited Data Accessibility: Manual attendance tracking methods often lead to fragmented and disorganized data storage. This makes it difficult to retrieve and analyze attendance data for various reporting and analysis purposes, hindering the effective monitoring of attendance trends and patterns.

1.2 Objectives

Automation: The primary objective of implementing a QR code-based attendance system is to automate the attendance tracking process. By using QR codes, the system aims to eliminate manual entry, reducing the time and effort required for recording attendance.

Accuracy: Another objective is to enhance the accuracy of attendance data. QR codes provide a reliable and error-free method for capturing attendance, minimizing the chances of human error or intentional manipulation.

Efficiency: The system aims to improve the efficiency of the attendance process. Scanning QR codes is a quick and seamless method that saves time for both instructors and participants, allowing for optimized use of class or event time.

Security: Enhancing the security of attendance records is a crucial objective. QR codes offer a level of security by generating unique codes that are difficult to replicate, reducing the risk of attendance fraud and ensuring the integrity of attendance data.

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User-Friendly Interface: The attendance system should have a user-friendly interface, making it easy for both instructors and participants to use. This objective ensures that the system is accessible and can be adopted by users with varying levels of technical expertise.

1.3 Project Scope

The scope of an attendance system using QR codes encompasses various aspects related to attendance management and tracking. Here are the key components within the scope of such a system:

1. QR Code Generation: The system includes the ability to generate unique QR codes for each participant or student. These codes should be easily generated and printable for distribution.
2. Attendance Recording: The system should automatically record attendance in real-time when participants scan their QR codes using the mobile application. This process eliminates the need for manual entry and ensures accuracy and efficiency.

3 . Data Storage and Access: The attendance data captured through QR code scanning should be securely stored and easily accessible. A database or cloud storage solution can be utilized to store the attendance records,.

1.4 **Existing System**

The manual attendance system relies on traditional methods, such as paper-based attendance sheets or sign-in registers. In this system, participants or students are required to physically sign or mark their presence on the designated attendance sheet or register at the beginning of an event, class, or meeting. The attendance records are manually compiled and stored for future reference and analysis.

Manual-based attendance system offers a straightforward and accessible method for recording attendance. While it has advantages such as simplicity and immediate participant verification, it also has limitations, including potential errors and time-consuming data management. Organizations should evaluate their specific needs and consider implementing more advanced attendance systems to streamline processes, improve accuracy, and gain actionable insights from attendance data.

1.5 Proposed System

A proposed attendance system using QR codes can be an efficient and convenient way to track and manage attendance for various classes.. Here's an outline of how such a system could work:

1.Registration: Teacher or Student would need to register for the event or join the organization beforehand, providing their relevant details such as name, ID, or any other required information.

2.QR Code Generation: Once registered, a unique QR code would be generated for each participant or employee. This QR code would contain their identification information in an encrypted format.

3.Displaying QR Codes: Participants can receive their QR codes via email, mobile app, or a printed copy. The QR code could be displayed on their smartphones or printed on identification cards, making it easily accessible.

4.Scanning Process: When participants arrive at the venue or start their work shift, they would present their QR codes to the scanning device. The device would capture and decrypt the information from the QR code.

5.Verification and Attendance Recording: The system would verify the scanned QR code against the registered database to ensure the validity of the attendee. If the code is valid, the system would record the attendance of the participant or employee for that specific date and time.

Chapter 2

REQUIREMENT SPECIFICATION

Requirement analysis involved defining customer needs and objectives in the context of planned customer use, environments and identified system characteristics to determine requirements for system functions.

1.User Requirements: It entailed user involvement and statements of facts and assumptions that define the expectations of the system in terms of mission objectives, environment, constraints and measures of effectiveness and suitability.

Basically the users:

i) A system that improves on the efficiency of information storage and retrieval.
ii) A system that is easy to learn and use
iii) A system that is fast in processing transactions
iv) A system that is flexible, safe and convenient

2. Functional Requirements :

This is a necessary task, action or activity that was accomplished. The proposed system is able to:

i) Allow librarian to add new books and students and details
ii) Allow the librarian to delete book details
iii) Allow the students to search books
iv) Allow the librarian to edit student details.

Hardware Requirements:

1. Processor :core i3 and above.
2. Hard Disk :500 Gb.
3. Memory :8Gb.

Software Requirements:

1. Windows 10 and above.
2. XAMPP Server.
3. PHP, HTML and CSS.
4. MySQL Database.

Chapter 3

DIAGRAMS

4.1 E-R(Entity-Relationship) Diagram :-

E-R diagram enable to fully specify the data objects that are input & output from a system. The attributes that define the properties of these objects & their relationships.

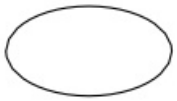
There are three basic notations that are used in E-R diagram :-

1. Entity :

   It is a object which you want to store information.

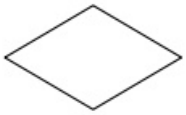
2. Attributes :

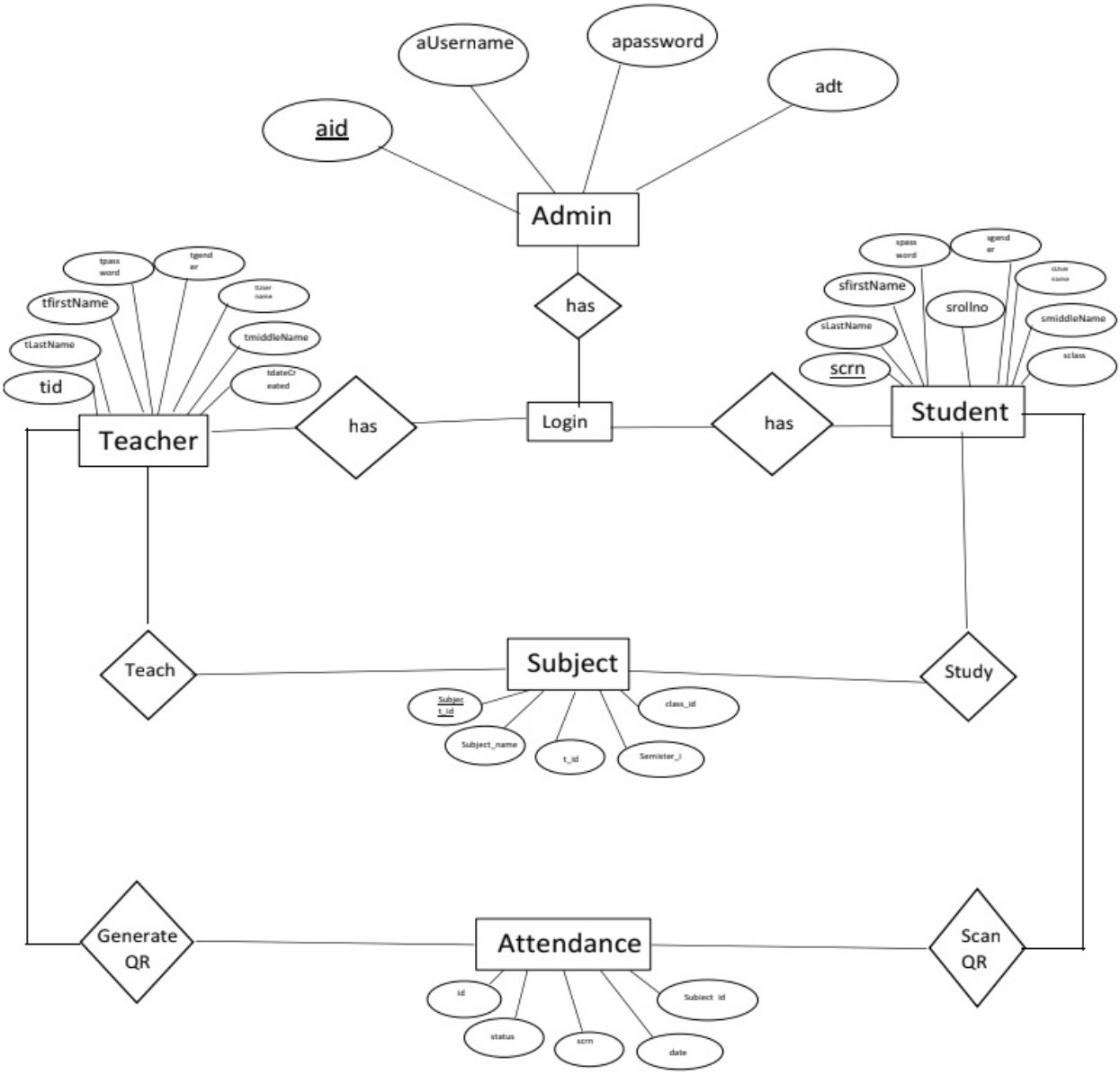
   It is the unique, distinguishing characteristics of entity.



3. Relationships :

   How two entities share information in the database structure.





ER-Diagram

1-1 : One to One relationship.

1-M : One to Many relationship.

M-1 : Many to One relationship.

M-M : Many to Many relationship.

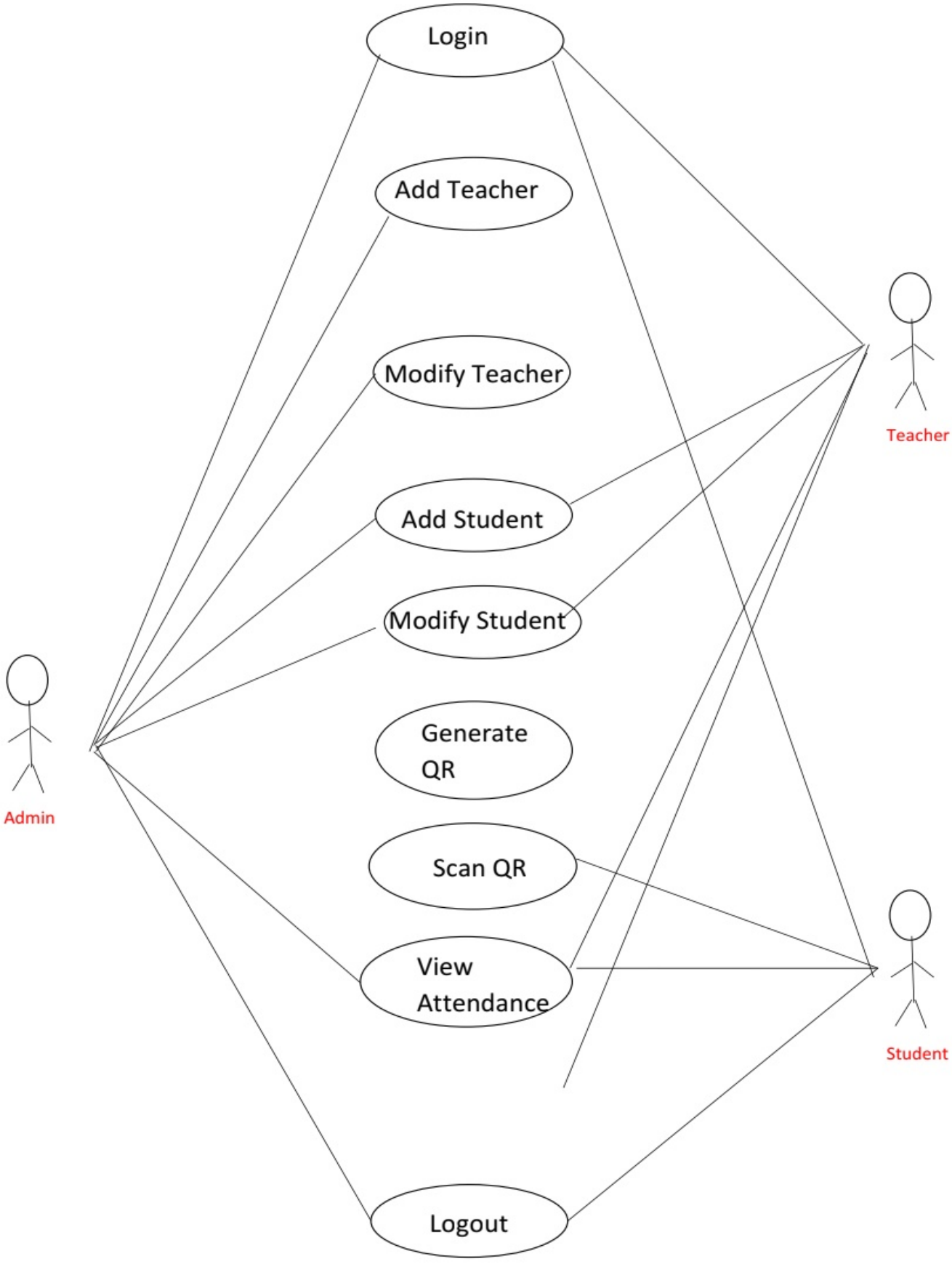
4.2 UML Diagrams:-

UML stands for Unified Modelling Language. It is a general purpose modelling language which is designed to provide a standard way to visualize the design of a system.

4.2.1 Use Case Diagram :-

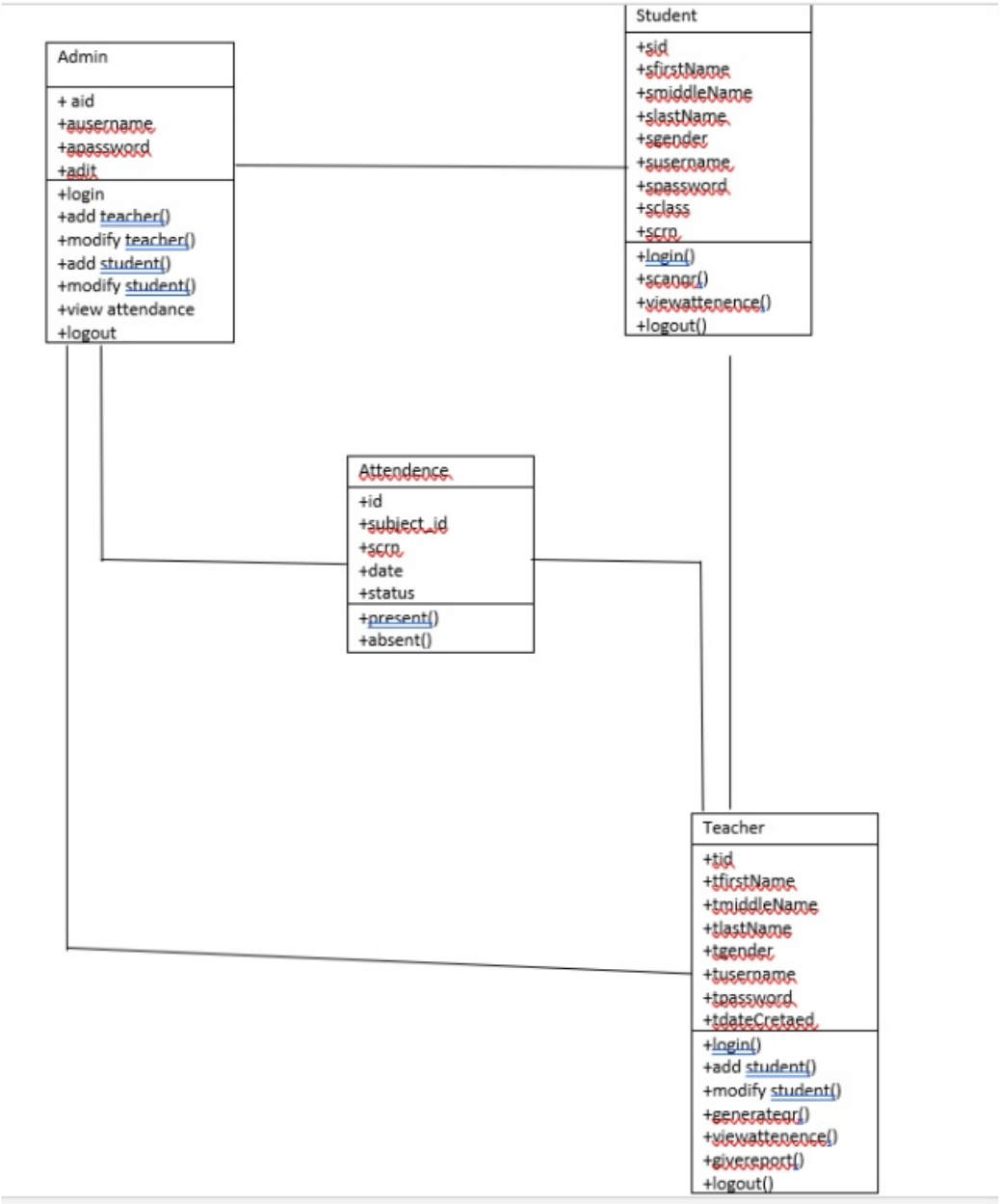
A Use Case diagram use to interact with the system to solve a problem.
Use Case diagram commonly contains : Subject, Usecases, Actors, Dependancy, Association, Generalization and Relationship between them.

{
Include :- Compulsory Field.
Extend :- Optional Field.
}


Login
Add Teacher
Modify Teacher
Add Student
Modify Student
Generate QR
Scan QR
View Attendance
Logout
Admin
Teacher
Student

4.2.2 Class Diagram :-

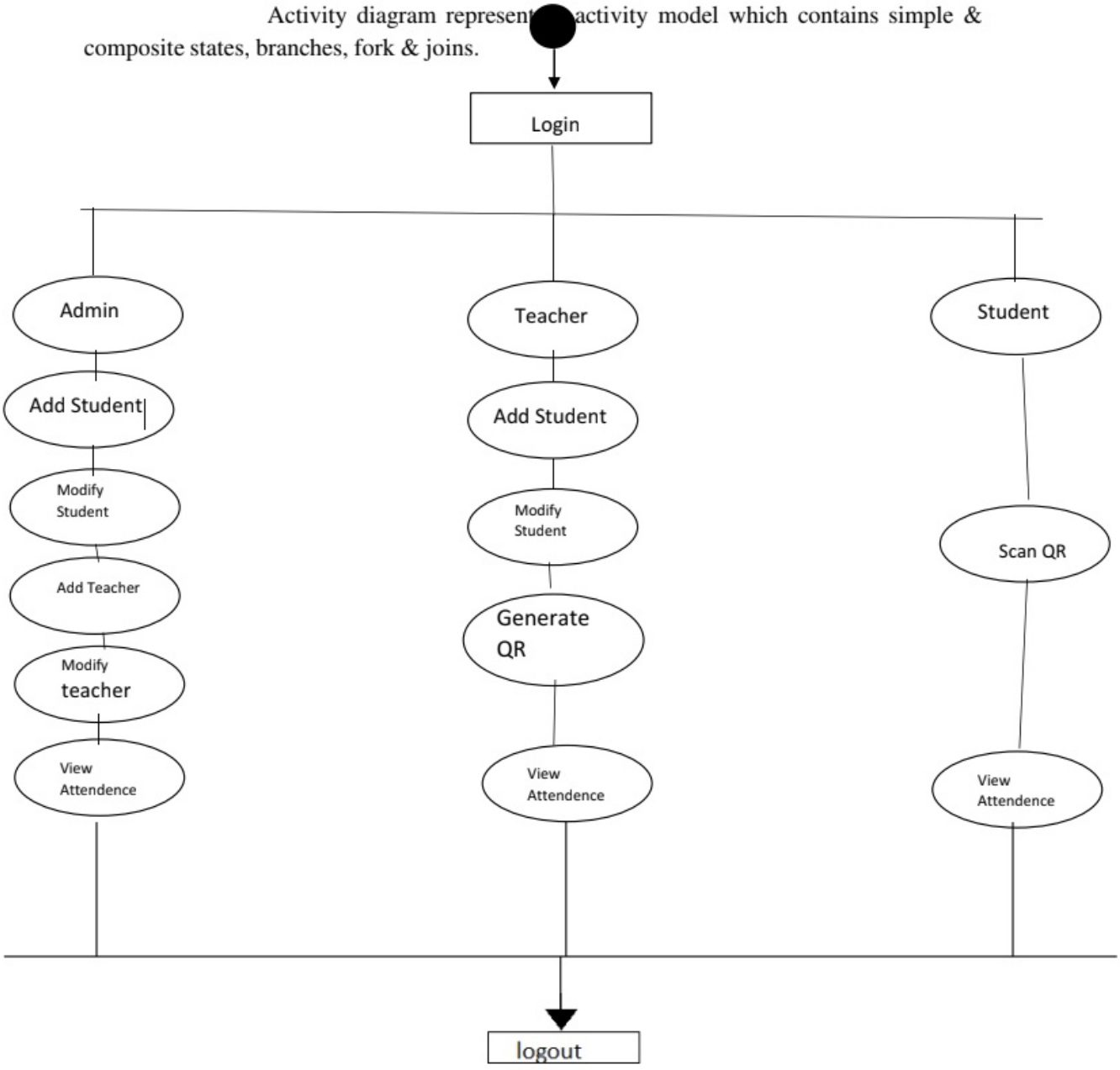
It is a type of static structure diagram. That describes the structure of system by showing the system's classes, their attributes, operations and the relationship among objects.



4.2.3 Activity Diagram :-

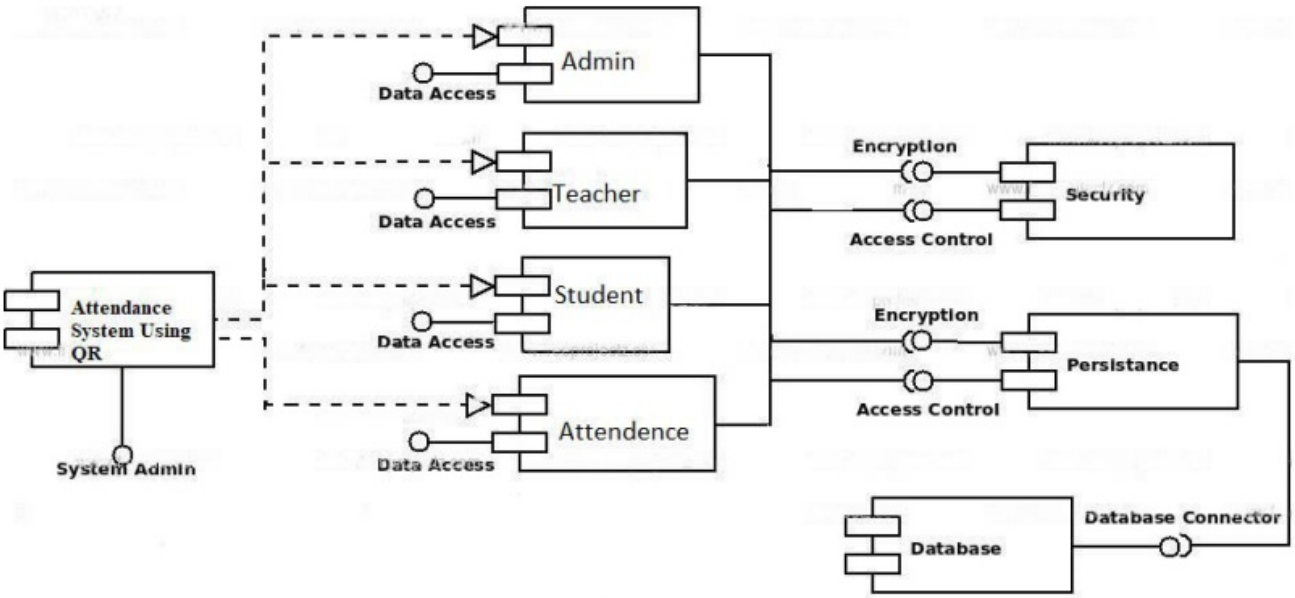
Activity diagram emphasize the flow of control from activity to activity. An activity is an ongoing non-atomic execution within a static machine.

Activity diagram represent activity model which contains simple & composite states, branches, fork & joins.



Activity Digram

6.Componet Diagram:



Advantages:

1.Efficiency: QR code-based attendance systems are highly efficient. They allow for quick and easy recording of attendance without the need for manual paperwork or time-consuming processes. Attendees can simply scan their QR codes using a smartphone or a dedicated QR code scanner, reducing the time and effort required for attendance tracking.

2.Accuracy: QR codes provide a high level of accuracy in attendance tracking. Each QR code contains unique information that identifies the individual or the item being tracked. This eliminates the possibility of errors or misidentification that can occur with manual attendance recording or other conventional methods.

3.Automation: QR code attendance systems can be integrated with automated processes, such as data collection, storage, and analysis. This automation reduces administrative tasks and ensures that attendance records are accurately captured and securely stored without relying on manual intervention.

4.Cost-effective: QR code attendance systems can be cost-effective compared to traditional methods. There is no need for physical attendance sheets, ID cards, or additional hardware devices. The implementation cost is relatively low, as QR codes can be generated and printed inexpensively, and the scanning process can be performed using widely available smartphones or tablets

Limitations:

While using a QR code-based attendance system offers several advantages, it also has certain limitations. Here are some limitations to consider:

1. Dependence on QR Code Scanning: The accuracy of the attendance system depends on successfully scanning the QR codes. Factors like low-quality or damaged QR codes, poor lighting conditions, or incorrect scanning techniques can lead to scanning failures and inaccurate attendance records.
2. Privacy Concerns: QR code attendance systems involve collecting and storing personal data, such as attendance records and user information. It's essential to implement proper data protection measures to ensure privacy and comply with applicable data protection regulations.
3. Cost and Infrastructure: QR code attendance systems may require initial investment in infrastructure, such as QR code generation and scanning devices. Additionally, maintenance costs and system updates should be considered for long-term usage

Data Dictionary:

1. admin:

Field Name	Data Type	Description
aid	int	Not null
ausername	varchar	Not null
apassward	varchar	Not null
adt	datetime	Not Null

2.Teacher :

Field Name	Data Type	Description
tid	int	Not null
tfirstName	varchar	Not null
tmiddleName	varchar	Not null
tlastName	varchar	Not null
tgender	varchar	Not null
tdateCreated	datetime	Not null
tpassword	varchar	Not null
tusername	varchar	Not null

3.fystudent :

Field Name	Data Type	Description
srollno	int	Not null
sfirstName	varchar	Not null
smiddleName	varchar	Not null
slastName	varchar	Not null
sgender	varchar	Not null
sdateCreated	datetime	Not null
tpassword	varchar	Not null
tusername	varchar	Not null

scrn	int	Not null
sclass	varchar	Not null

4.systudent :

Field Name	Data Type	Description
srollno	int	Not null
sfirstName	varchar	Not null
smiddleName	varchar	Not null
slastName	varchar	Not null
sgender	varchar	Not null
sdateCreated	datetime	Not null
tpassword	varchar	Not null
tusername	varchar	Not null
scrn	Int	Not null
Sclass	Varchar	Not null

5.tystudent:

Field Name	Data Type	Description
srollno	int	Not null
sfirstName	varchar	Not null
smiddleName	varchar	Not null
slastName	varchar	Not null
sgender	varchar	Not null
sdateCreated	datetime	Not null
tpassword	varchar	Not null
tusername	varchar	Not null
scrn	Int	Not null
Sclass	Varchar	Not null

6.class:

Field Name	Data Type	Description
class_id	int	Not null
Class_name	varchar	Not null

7.semester:

Field Name	Data Type	Description
semester_id	int	Not null
Semester_name	varchar	Not null

8. subjects:

Field Name	Data Type	Description
subject_id	int	Not null
subject_name	varchar	Not null
tid	int	Not null
semester_id	int	Not null
Class_id	int	Not null

9. fyattendance :

Field Name	Data Type	Description
id	int	Not null
Subject_id	Int	Not null
scrn	Int	Not null
date	date	Not null
status	int	Not Null

10. syattendance :

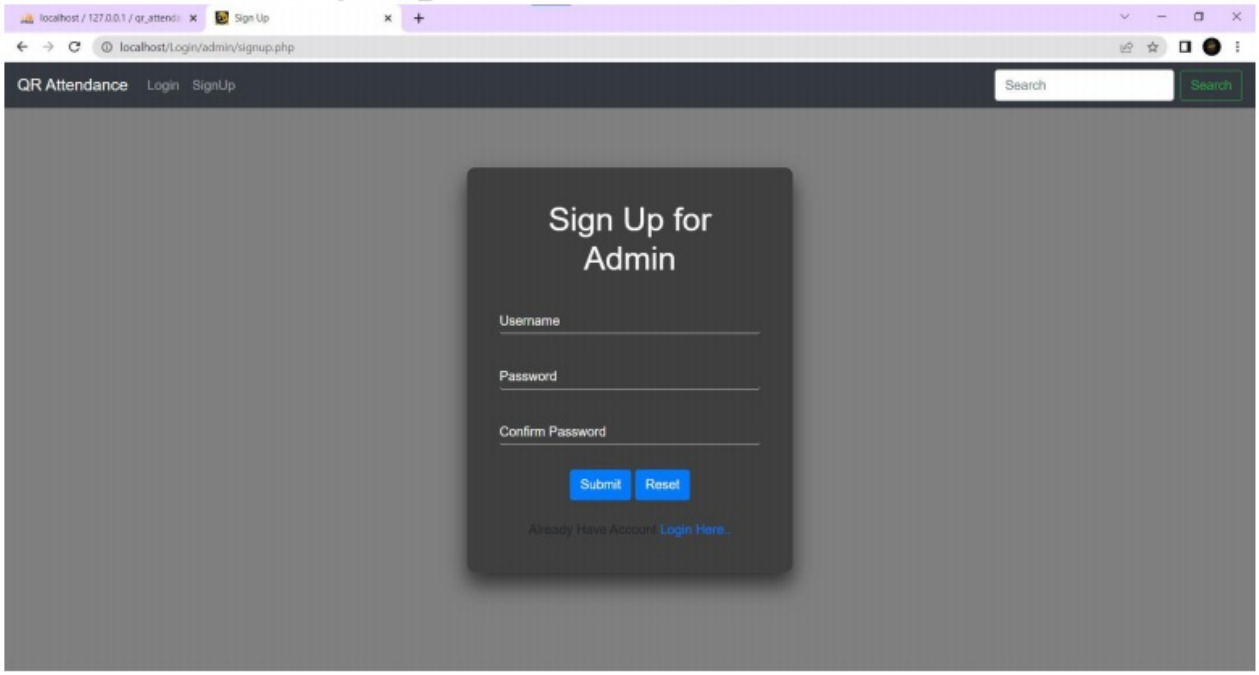
Field Name	Data Type	Description
id	int	Not null
Subject_id	Int	Not null
scrn	Int	Not null
date	date	Not null
status	int	Not Null

11. tyattendance :

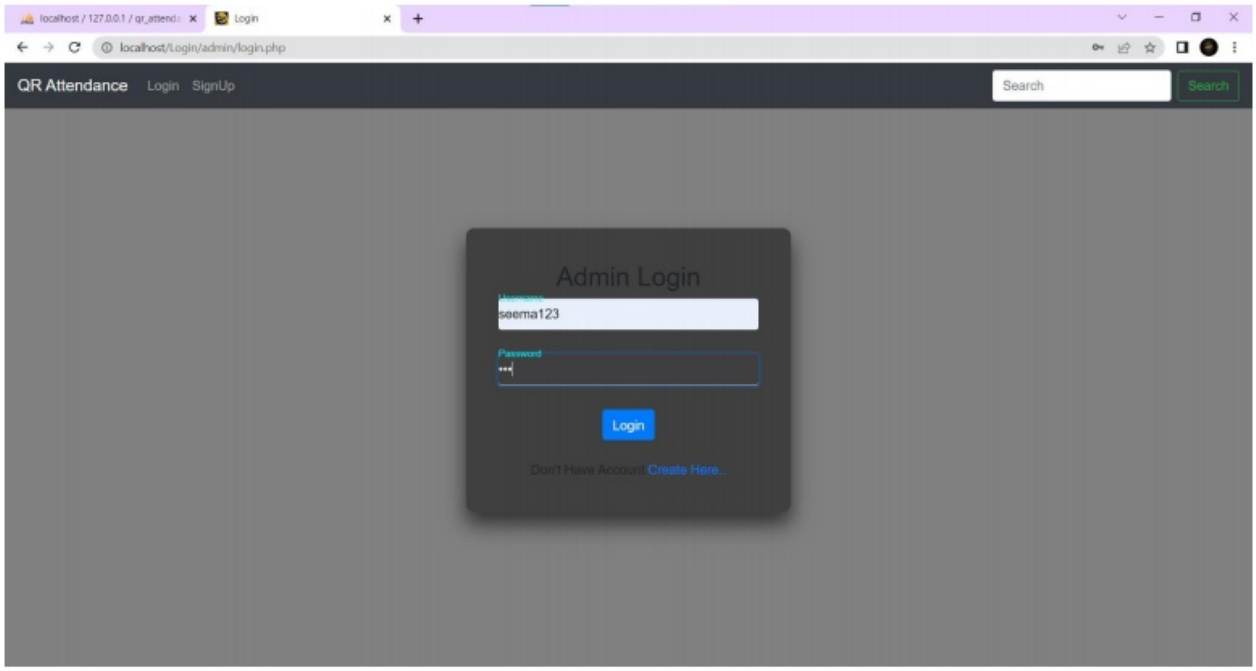
Field Name	Data Type	Description
id	int	Not null
Subject_id	Int	Not null
scrn	Int	Not null
date	date	Not null
status	int	Not Null

Input and Output Screen:

1. Admin Sign up:

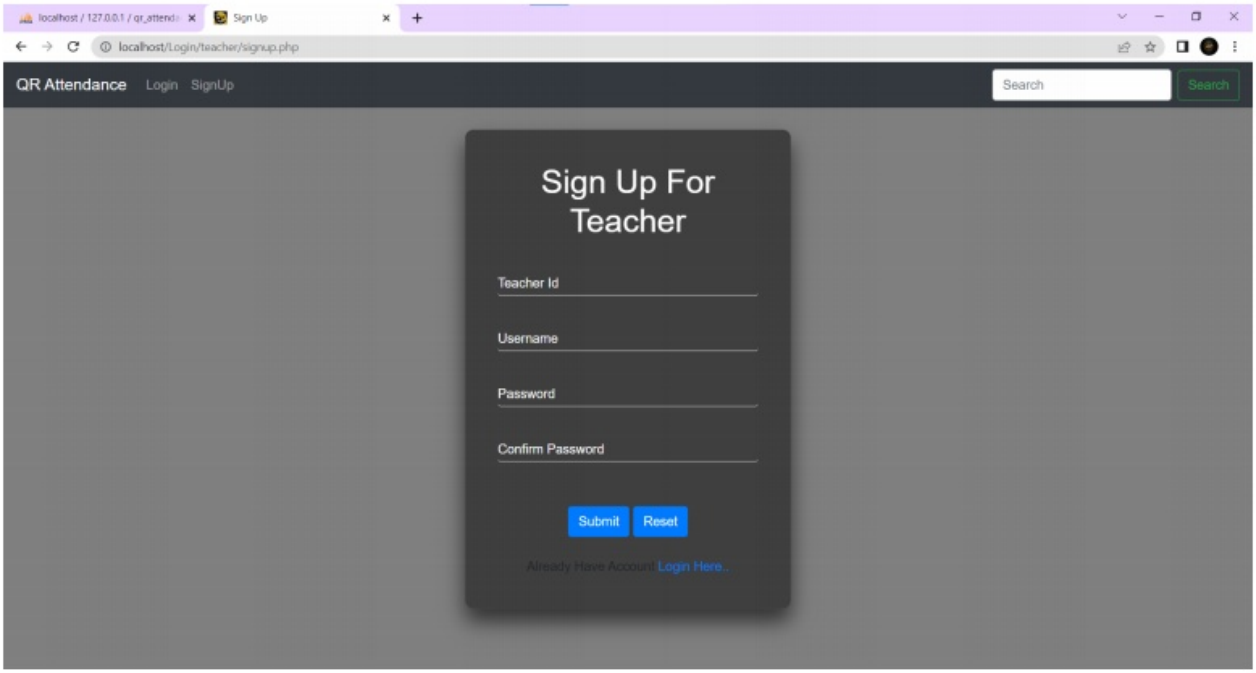


2. AdminLogin Page:

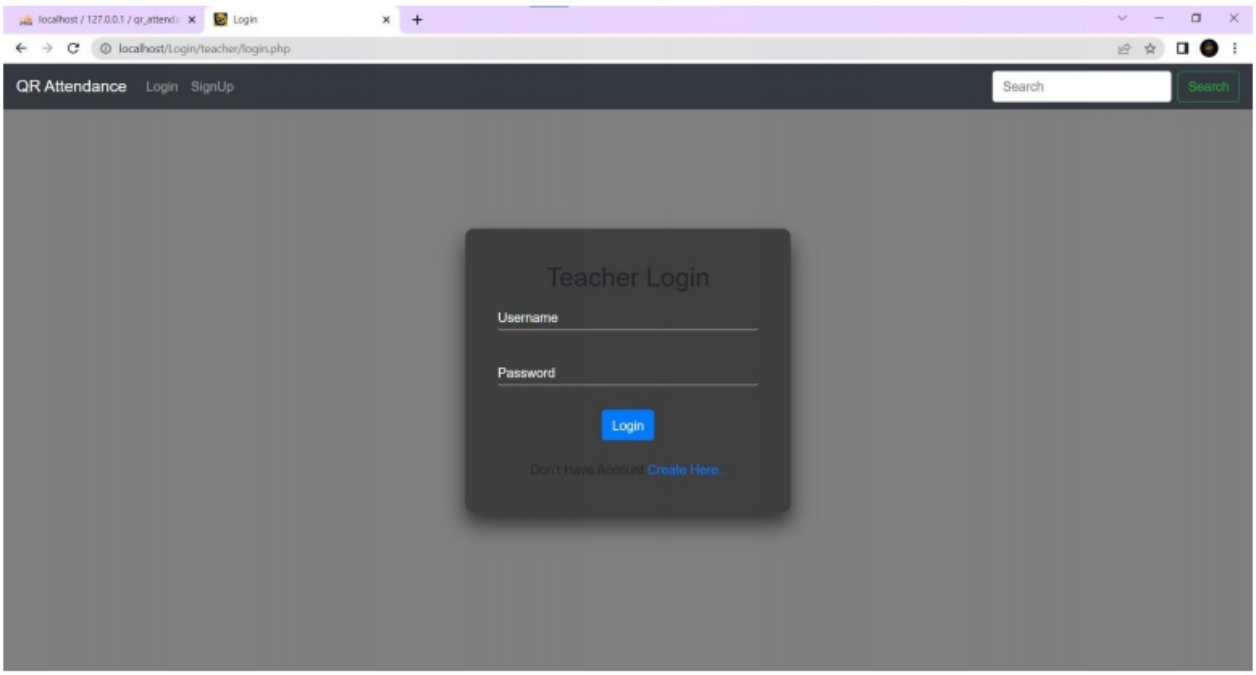


Input and Output Screen:

3. Teacher Sign up:

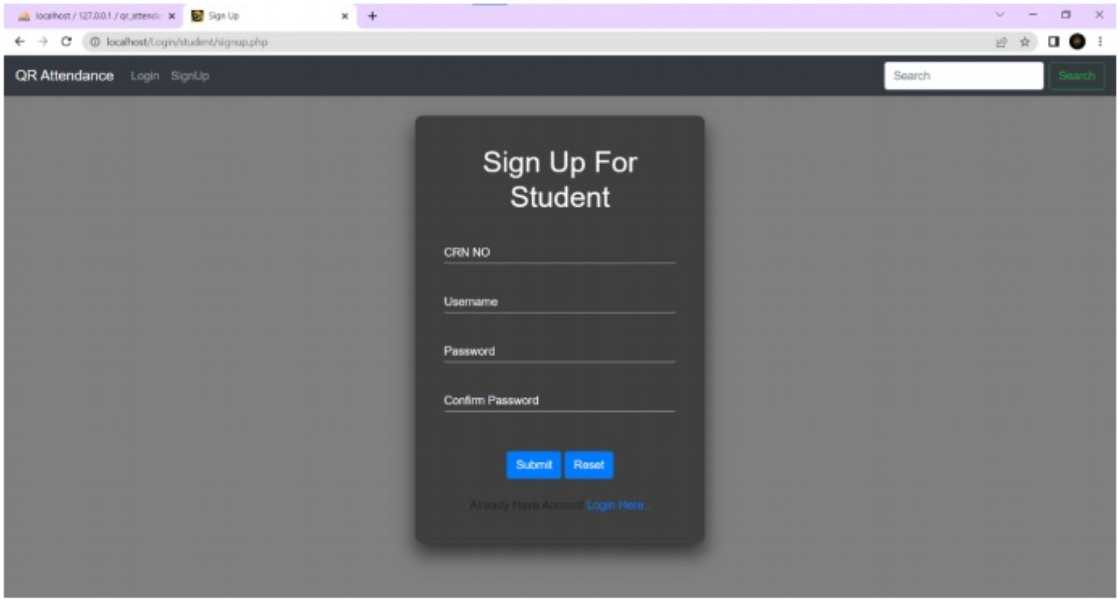


4. Teacher Login Page:

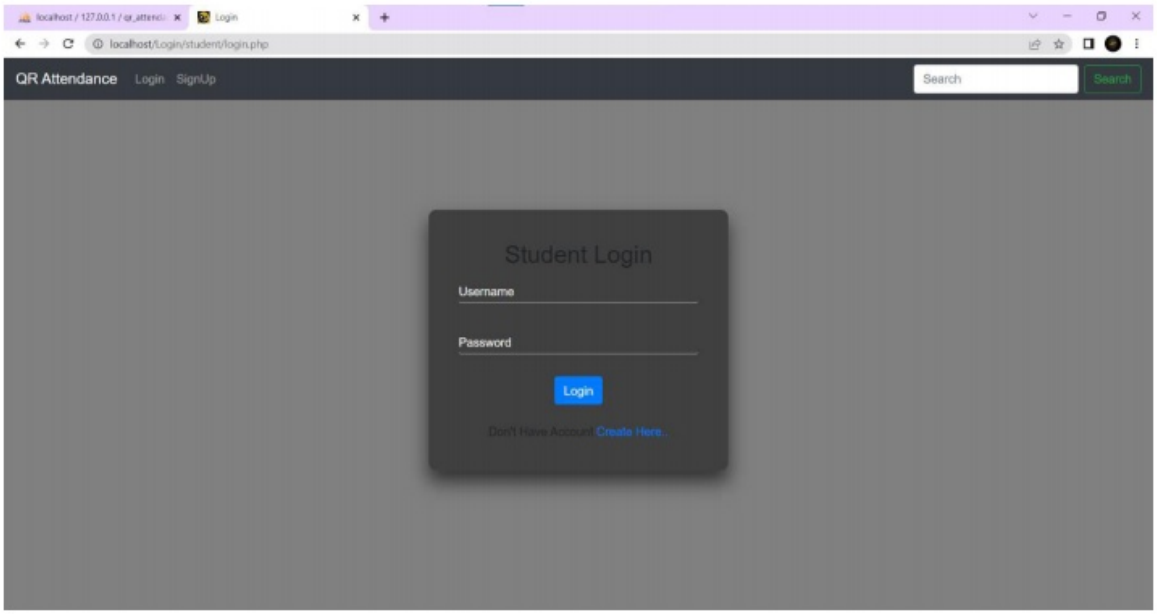


Input and Output Screen:

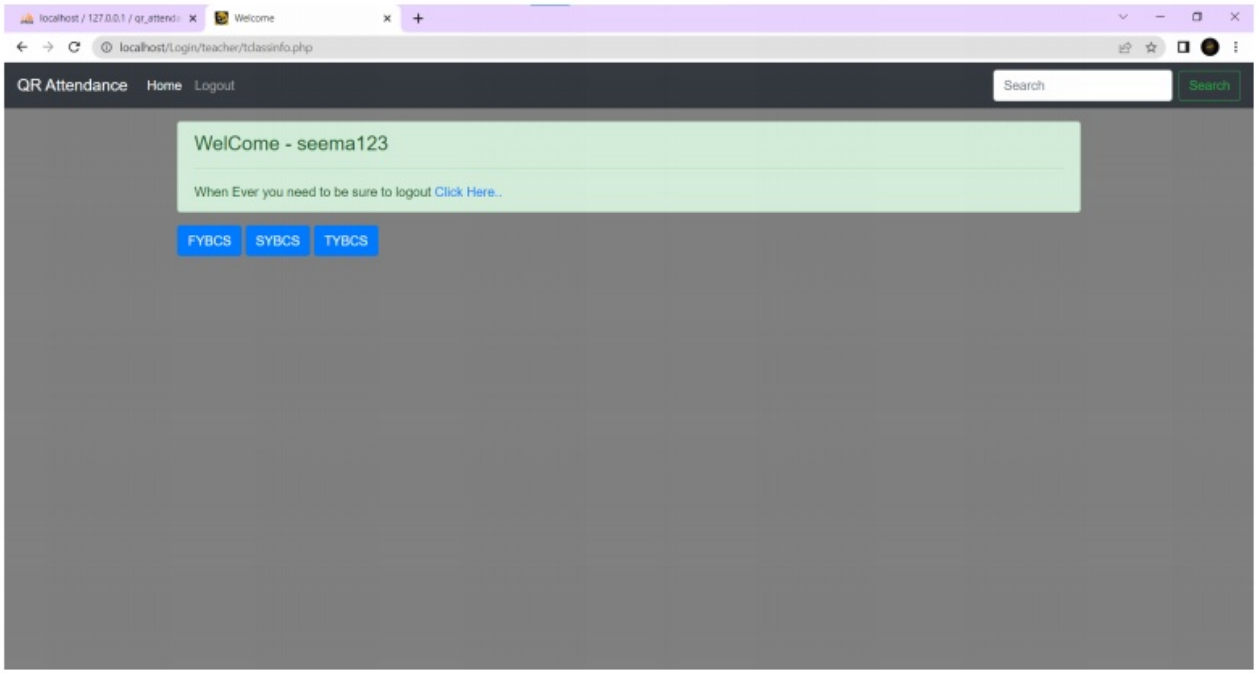
5. Student Sign up:



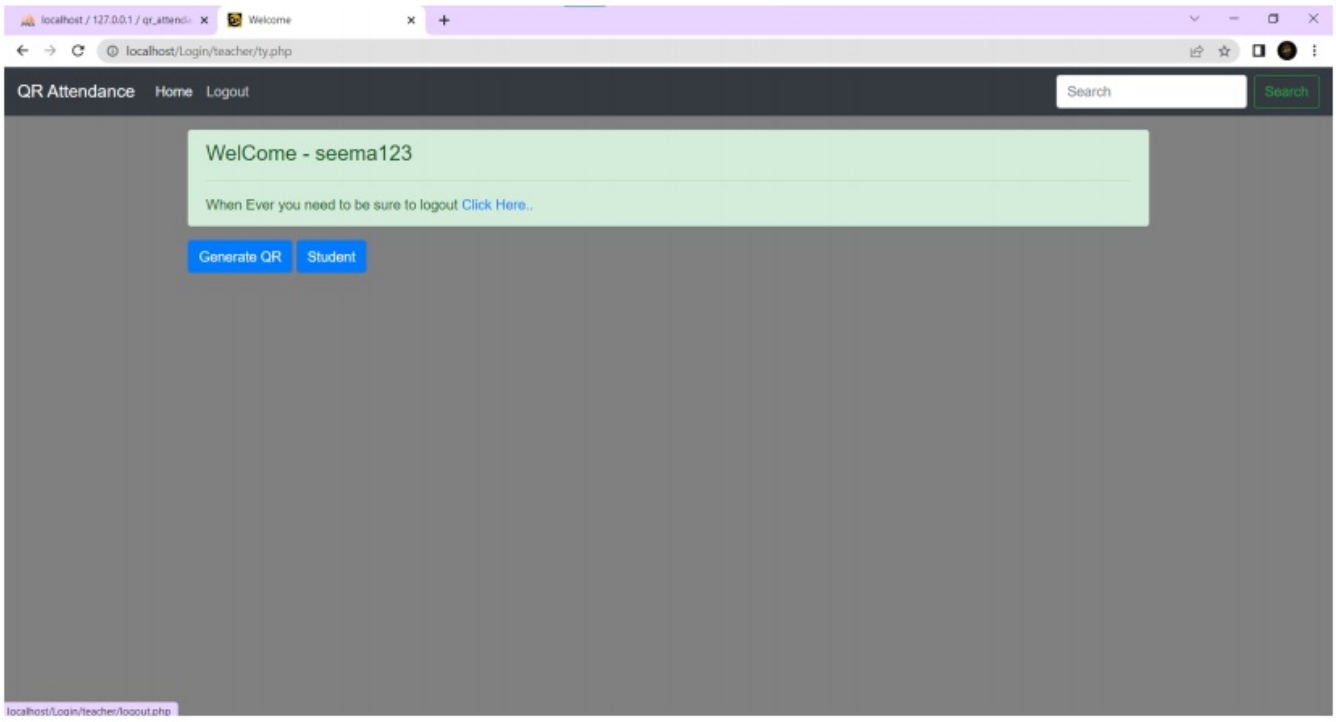
6. Student Login Page:



7.Welcome



8. Generate QR or Edit Student:



9.Genarated QR

Conclusion:

The conclusion can be drawn that the QR code-based attendance system is an efficient and effective solution for managing attendance in various settings.

1.Accuracy and Reliability: QR codes provide a reliable and accurate means of recording attendance. Each QR code contains unique information that can be linked to an individual student, employee, or attendee. Scanning the QR code ensures that the correct person is present, reducing the chances of errors or fraudulent attendance.

2.Efficiency and Time-saving: The QR code-based system streamlines the attendance process by eliminating the need for manual registration or verification. Attendees can simply scan their QR codes using a smartphone or dedicated scanner, and their attendance is instantly recorded. This saves time for both the attendees and the administrators responsible for managing attendance records.

3.Real-time Data: The system generates real-time data, allowing administrators to monitor attendance instantly. This enables quick decision-making and timely intervention if necessary. Administrators can easily access attendance reports and identify patterns or trends, aiding in planning and resource allocation.

4.Cost-effective: Implementing a QR code-based attendance system can be cost-effective compared to traditional methods.

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