A

Mini Project

On

# QR CODE BASED ATTENDANCE SYSTEM

(Submitted in partial fulfillment of the requirements for the award of Degree)

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

By

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Under the Guidance of

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# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

# CMR TECHNICAL CAMPUS

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**2020-2024**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**



# CERTIFICATE

This is to certify that the project entitled "**QR CODE BASED ATTENDANCE SYSTEM**" being submitted by **D. DHANASRI (207R1A0509)** in partial fulfillment of the requirements for the award of the degree of B.Tech in Computer Science and Engineering to the Jawaharlal Nehru Technological University Hyderabad, is a record of bonafide work carried out by them under our guidance and supervision during the year 2023-24.

The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma.

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     HOD

**Submitted for viva voice Examination held on** _____

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**D. DHANASRI (207R1A0509)**

# ABSTRACT

In higher education institutions, student participation in the classroom is directly related to their academic performance. However, the majority of student attendance registration is still conventionally done, which is tedious and time consuming, especially for those courses that involve large numbers of students. Over the years, attendance management has been conducted manually at most of the universities. To overcome the manual attendance issues, we proposed and implemented a smart attendance system with the aim to encourage the potential use of the Quick Response (QR) code as a future attendance management system, to track and record student attendance in lectures and exercises for all relevant courses.

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# 1. INTRODUCTION

# 1.INTRODUCTION

## 1.1 PROJECT SCOPE

A QR code-based attendance system involves creating unique QR codes for each participant. Users scan their QR code upon arrival, and the system records their attendance. The scope includes designing a user- friendly mobile app or web interface, a database to store attendance records, and integration with a QR code generator. It should also incorporate security measures to prevent fraudulent attendance and generate reports for easy tracking and analysis. Additionally, consider scalability and compatibility with various devices and platforms.

## 1.2 PROJECT PURPOSE

The purpose of a QR code-based attendance system is to streamline and automate the attendance tracking process in various settings, such as schools, workplaces, and events. It aims to enhance efficiency by replacing manual attendance taking with a quick and contactless method. This system allows participants to simply scan a QR code with their smartphones, marking their presence in real-time. It also provides accurate data for attendance records, reduces the likelihood of errors, and offers convenient data management. Overall, it modernizes attendance management while saving time and resources.

## 1.3 PROJECT FEATURES

A QR code-based attendance system offers a streamlined and efficient way to track attendance in various settings. This system generates unique QR codes for each participant, which can be easily scanned using asmartphone. It eliminates the need for manual attendance recording, reduces errors, and enhances data accuracy.

# 2.SYSTEM ANALYSIS

# 2. SYSTEM ANALYSIS

## SYSTEM ANALYSIS

System Analysis is the important phase in the system development process. The System is studied to the minute details and analyzed. The system analyst plays an important role of an interrogator and dwells deep into the working of the present system. A key question considered here is, "what must be done to solve the problem?" The system is viewed as a whole and the inputs to the system are identified. Once analysis is completed the analyst has a firm understanding of what is to be done.

## 2.1 PROBLEM DEFINITION

A QR code-based attendance system is designed to streamline attendance tracking by generating unique QR codes for individuals and scanning them upon entry, offering an efficient and contactless method for recording attendance in various settings, such as schools, workplaces, and events. This system enhances accuracy and reduces manual effort, improving overall attendance management.

## 2.2 EXISTING SYSTEM

In early years a punch card system was used for data storage, known as Hollerith cards, through which companies able to store and access via entering the card into the computer system. It is also commonly used nowadays as an attendance system in institutions. Employees wave their individual cards near a reader to punch in and out, ensuring the presence of the employee. There are quite a number of previous researches in the field of computer science developed students' attendance tracking system to improve record taking in class using technologies.

### 2.2.1 DISADVANTAGES OF EXISTING SYSTEM

Following are the disadvantages of existing system:
- Less Accuracy
- Low efficiency
- Security concerns
- High implementation cost
- Technical issues

## 2.3 PROPOSED SYSTEM

The proposed system by authors on aims to record all student participation based on the generated unique QR code of each course for each class day. The instructors, in turn, copy this QR code and paste it on the first slide to be displayed in the lecture. If the instructor policy is to allow late students in his class and would like to mark them as present or late, then the QR code should also be copied on one of thefour corners of asmany slides as the instructor wishes.

When the students are in class,the first thing that should be done is to pull out their smartphones, open the Mobile Module, and scan the QR code, then the Server Module runs an identity check on the registered students. This is done by comparing the facial image sent per transaction with the stored image on file for the student in question, the system will then control the location of student. Finally, a location check will be performed

### 2.3.1 ADVANTAGES OF THE PROPOSED SYSTEM

- Contactless attendance tracking
- Improved security
- Real-time reporting
- High accuracy
- High efficiency

## 2.4 FEASIBILITY   STUDY

The feasibility of the project is analyzed in this phase and a business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This isto ensure that the proposed system is not a burden to the company.

Three key considerations involved in the feasibility analysis:

- o  Economic Feasibility
- o  Technical Feasibility
- o  Social Feasibility

### 2.4.1 ECONOMIC FEASIBILITY

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products hadto be purchased.

### 2.4.2      TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technicalrequirements of the system. Any system developed must not have a high demand onthe available technical resources. The developed system must have a modest requirement as only minimal or null changes are required for implementing this system.

### 2.4.3 SOCIAL FEASIBILITY

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, insteadmust accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

## 2.5 HARDWARE & SOFTWARE REQUIREMENTS

### 2.5.1 HARDWARE REQUIREMENTS:

Hardware interfaces specify the logical characteristics of each interface betweenthe software product and the hardware components of the system. The following are some hardware requirements.

- Processor : Pentium IV or higher
- Hard disk : 512MB
- RAM : 256MB
- Input devices : Keyboard, mouse.

## 2.5.2 SOFTWARE REQUIREMENTS:

Software Requirements specifies the logical characteristics of each interface and software components of the system. The following are some software requirements,

- Operating system : Windows 7,Windows XP, Windows 8
- Languages : Python
- Tools : Python IDEL3.7 version, WampServer 2.4, MySql

# 3.ARCHITECTURE

# 3. ARCHITECTURE

## 3.1 PROJECT ARCHITECTURE

This project architecture shows the procedure followed for classification, starting from input to final prediction.
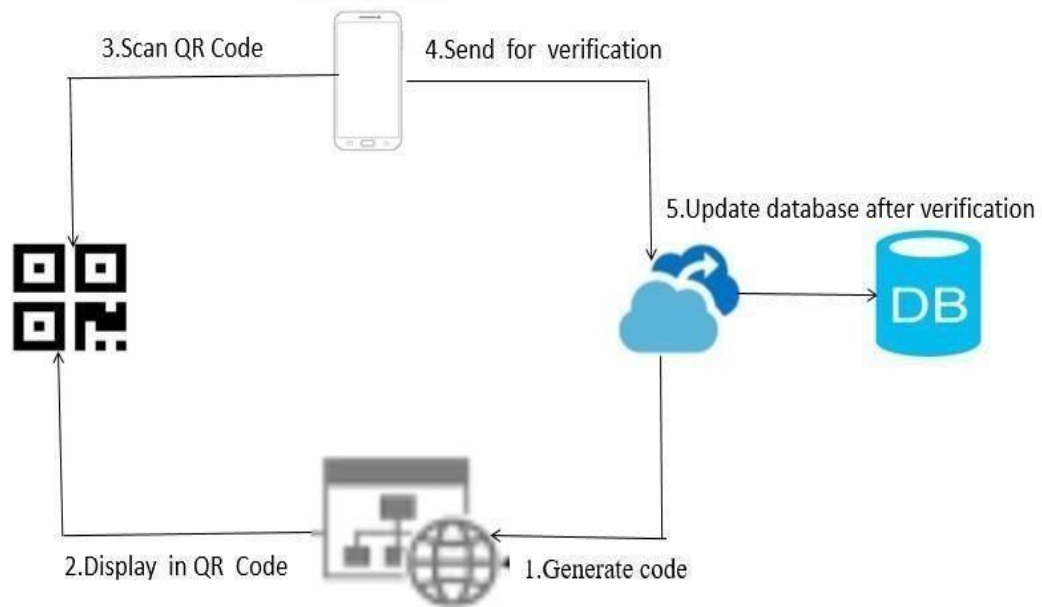


Figure 3.1: Project Architecture of QR Code Based
Attendance System

## 3.2 DESCRIPTION

A QR code-based attendance system is a modern and efficient method of recording attendance in various settings. It involves generating unique QR codes for individuals or participants, which they can easily access on their mobile devices. To mark attendance, individuals scan their QR code upon entry using a designated scanner or smartphone app.

This automated process eliminates the need for manual attendance sheets, reducing errors and saving time. The system can provide real-time attendance data, making it valuable for educational institutions, workplaces, and event organizers. Additionally, it offers a contactless and convenient way to track attendance.

The system works by generating QR codes for each participant and distributing them either digitally or in print. Participants can then present their QR codes using a mobile app or a dedicated device equipped with a camera. The system captures the QR code information through the camera, instantly marking the participant as present. This automated process eliminates the need for manual attendance taking, saving time and reducing the likelihood of errors.

Furthermore, the QR code-based attendance system enhances data accuracy and security. The digital nature of QR codes makes them resistant to duplication or tampering, ensuring the reliability of attendance records. Additionally, the system can generate real-time reports, providing administrators with valuable insights into attendance patterns and trends.

## 3.3 USE CASE DIAGRAM

In the use case diagram, we have basically one actor who is the user in the trainedmodel

A use case diagram is a graphical depiction of a user's possible interactions With a system. A use case diagram shows various use cases and different types of users the system has. The use cases are represented by either circles or ellipses. The actors are often shown as stick figures.
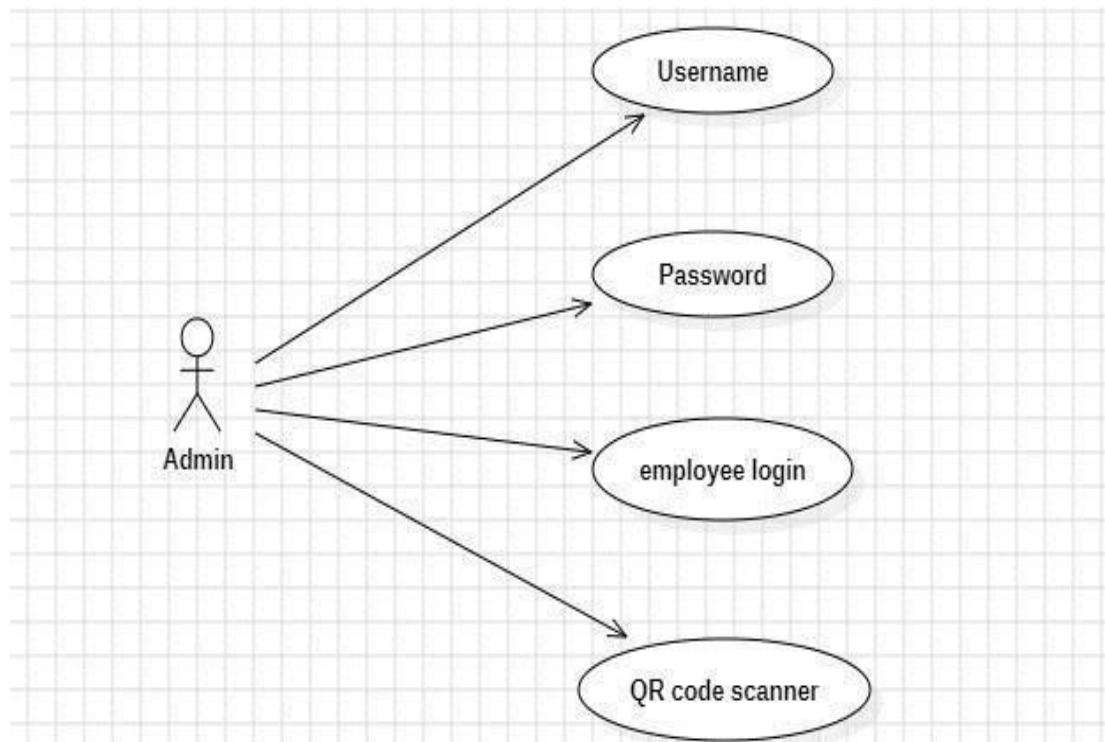


Figure 3.2: Use Case Diagram for QR Code Based Attendance
System

## 3.4 CLASS DIAGRAM

Class diagram is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), andthe relationships among objects.
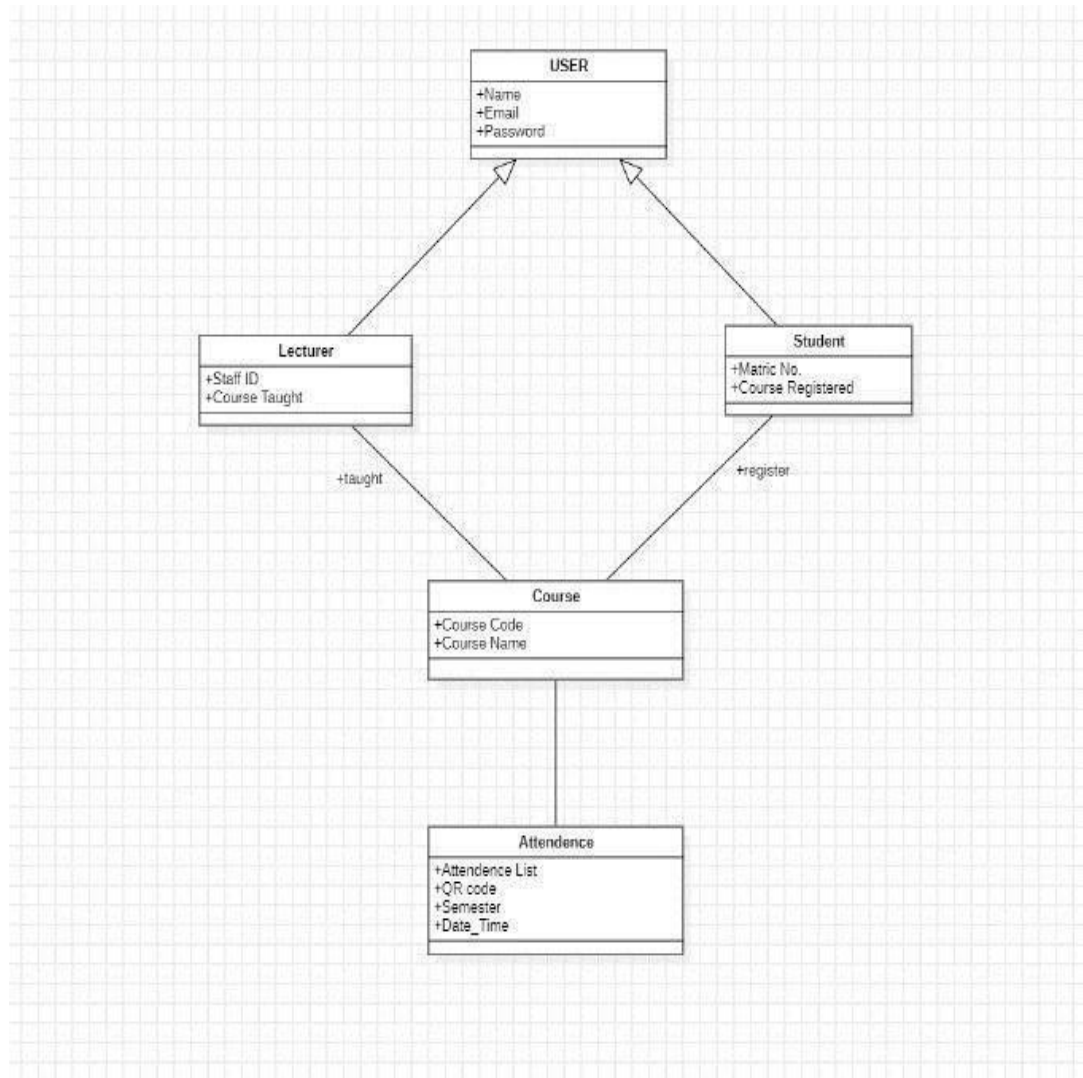


Figure 3.3: Class Diagram for QR Code Based Attendance System

## 3.5 SEQUENCE DIAGRAM

A sequence diagram shows object interactions arranged in time sequence. It depicts the objects involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are typically associated with use case realizations in the logical view of the system under development.
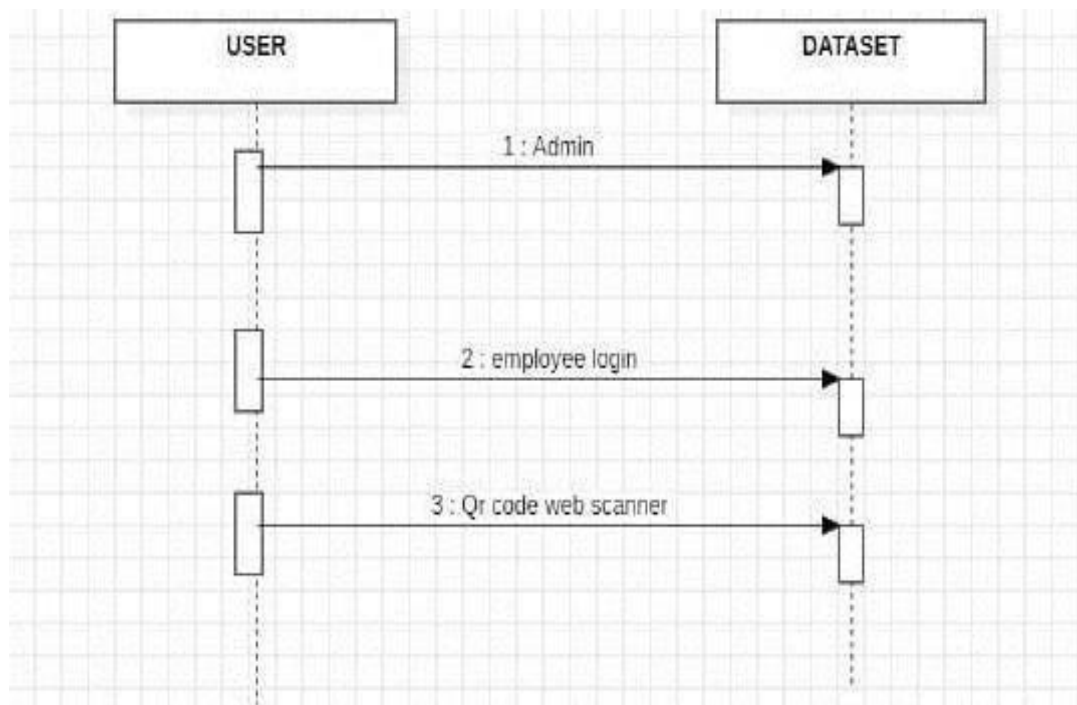


Figure 3.4: Sequence Diagram for QR Code Based Attendance System

# 4.IMPLEMENTATION

## 4.1 SAMPLE CODE :

```python
import os
from django.core.files.storage import FileSystemStorage
import pymysql
import  datetime
import pyqrcode
import png
from pyqrcode import QRCode
from django.shortcuts import render
from django.template import RequestContext
from django.contrib import messages
from django.http import HttpResponse
global username

def test(request):
if request.method == 'GET':
return render(request, 'test.html', {})

def AdminLoginAction(request):
global username
if request.method == 'POST':
username = request.POST.get('t1', False)
password = request.POST.get('t2', False)
if username == 'admin' and password == 'admin':
context= {'data':'Hello! Administrator'}
return render(request, 'AdminScreen.html', context)
else:
context= {'data':'login failed. Please retry'}
return render(request, 'AdminLogin.html', context)
def AdminLogin(request):
if request.method == 'GET':
return render(request, 'AdminLogin.html', {})
def UserLogin(request):
if request.method == 'GET':
return render(request, 'UserLogin.html', {})
def index(request):
if request.method == 'GET':
return render(request, 'index.html', {})
```

```
def AddEmp(request):
if request.method == 'GET':
return render(request, 'AddEmp.html', {})

def ViewEmpAttendanceAction(request):
if request.method == 'POST':
empid = request.POST.get('t1', False)
from_date = request.POST.get('t2', False)
to_date = request.POST.get('t3', False)
from_dd = str(datetime.datetime.strptime(from_date, "%d-%b-%Y").strftime("'%Y-%m-%d'"))
to_dd = str(datetime.datetime.strptime(to_date, "%d-%b-%Y").strftime("'%Y-%m-%d'"))
presence_days = 0
salary = 0
columns = ['Employee ID', 'Presence Date']
output = '<table border=1 align=center width=100%>'
font = '<font size="" color="black">'
output += "<tr>"
for i in range(len(columns)):
output += "<th>"+font+columns[i]+"</th>"
output += "</tr>"
con = pymysql.connect(host='127.0.0.1',port = 3306,user = 'root', password = 'root',
database = 'emp_attendance',charset='utf8')
with con:
cur = con.cursor()
cur.execute("select     emp_salary     FROM     employee_details     where
employeeID='"+empid+"'")
rows = cur.fetchall()
for row in rows:
salary= row[0]
break
con = pymysql.connect(host='127.0.0.1',port = 3306,user = 'root', password = 'root',
database = 'emp_attendance',charset='utf8')
with con:
cur = con.cursor()
cur.execute("select  *  from  mark_attendance   where  employeeID='"+empid+"' and
attended_date between "+from_dd+" and "+to_dd)
rows = cur.fetchall()
for row in rows:
presence_days = presence_days + 1
```

```
output += "<tr>"
output += "<td>"+font+str(row[0])+"</td>"
output += "<td>"+font+str(row[1])+"</td></tr>"
output+="<tr><td>"+font+"Attended
Days : "+str(presence_days)+"</font><td>"+font+"Current Salary = "+str(((salary/30) *
presence_days))+"</td></tr>"
context= {'data': output}
return render(request, 'AdminScreen.html', context)

def ViewEmpAttendance(request):
if request.method == 'GET':
font = '<font size="" color="black">'
output = '<tr><td>'+font+'Choose Emp ID</td><td><select name="t1">'
con = pymysql.connect(host='127.0.0.1',port = 3306,user = 'root', password = 'root',
database = 'emp_attendance',charset='utf8')
with con:
cur = con.cursor()
cur.execute("select employeeID FROM employee_details")
rows = cur.fetchall()
for row in rows:
output += '<option value="'+row[0]+'">'+row[0]+'</option>'
output += "</select></td></tr>"
context= {'data1': output}
return render(request, 'ViewEmpAttendance.html', context)

def ViewAttendance(request):
if request.method == 'GET':
return render(request, 'ViewAttendance.html', {})

def ViewAttendanceAction(request):
if request.method == 'POST':
global username
empid = username
from_date = request.POST.get('t1', False)
to_date = request.POST.get('t2', False)
from_dd = str(datetime.datetime.strptime(from_date, "%d-%b-%Y").strftime("'%Y-%m-
%d'"))
to_dd = str(datetime.datetime.strptime(to_date, "%d-%b-%Y").strftime("'%Y-%m-%d'"))
presence_days = 0
salary = 0
```

```python
columns = ['Emp ID', 'Attended Date']
output = '<table border=1 align=center width=100%>'
font = '<font size="" color="black">'
output += "<tr>"
for i in range(len(columns)):
output += "<th>"+font+columns[i]+"</th>"
output += "</tr>"
con = pymysql.connect(host='127.0.0.1',port = 3306,user = 'root', password = 'root',
database = 'emp_attendance',charset='utf8')
with con:
cur = con.cursor()
cur.execute("select       emp_salary       FROM       employee_details       where
employeeID='"+empid+"'")
rows = cur.fetchall()
for row in rows:
salary= row[0]
break
con = pymysql.connect(host='127.0.0.1',port = 3306,user = 'root', password = 'root',
database = 'emp_attendance',charset='utf8')
with con:
cur = con.cursor()
cur.execute("select  * from mark_attendance   where  employeeID='"+empid+"' and
attended_date between "+from_dd+" and "+to_dd)
rows = cur.fetchall()
for row in rows:
presence_days = presence_days + 1
output += "<tr>"
output += "<td>"+font+str(row[0])+"</td>"
output += "<td>"+font+str(row[1])+"</td></tr>"
output+="<tr><td>"+font+"Attended
Days : "+str(presence_days)+"</font><td>"+font+"Current Salary = "+str(((salary/30) *
presence_days))+"</td></tr>"
context= {'data': output}
return render(request, 'UserScreen.html', context)

def ViewEmp(request):
if request.method == 'GET':
columns = ['Emp ID', 'Name', 'Phone No', 'Designation', 'Salary']
output = '<table border=1 align=center width=100%>'
font = '<font size="" color="black">'
```

```
output += "<tr>"
for i in range(len(columns)):
output += "<th>"+font+columns[i]+"</th>"
output += "</tr>"
con = pymysql.connect(host='127.0.0.1',port = 3306,user = 'root', password = 'root',
database = 'emp_attendance',charset='utf8')
with con:
cur = con.cursor()
cur.execute("select * FROM employee_details")
rows = cur.fetchall()
for row in rows:
output += "<tr>"
output += "<td>"+font+str(row[0])+"</td>"
output += "<td>"+font+str(row[1])+"</td>"
output += "<td>"+font+str(row[2])+"</td>"
output += "<td>"+font+str(row[3])+"</td>"
output += "<td>"+font+str(row[4])+"</td></tr>"
context= {'data': output}
return render(request, 'AdminScreen.html', context)


def UserLoginAction(request):
global username
if request.method == 'POST':
username = request.POST.get('t1', False)
index = 0
emp_name = None
con = pymysql.connect(host='127.0.0.1',port = 3306,user = 'root', password = 'root',
database = 'emp_attendance',charset='utf8')
with con:
cur = con.cursor()
cur.execute("select employeeID, empployeeName FROM employee_details")
rows = cur.fetchall()
for row in rows:
if row[0] == username:
emp_name = row[1]
index = 1
break
if index == 1:
context= {'data':'welcome '+emp_name}
return render(request, 'UserScreen.html', context)
```

```
else:
context= {'data':'login failed. Please retry'}
return render(request, 'UserLogin.html', context)

def DownloadAction(request):
if request.method == 'POST':
global username
infile = open("EmployeeAttendance/static/qrcodes/"+username+".png", 'rb')
data = infile.read()
infile.close()

response = HttpResponse(data, content_type='image/png')
response['Content-Disposition'] = 'attachment; filename=%s' % username+".png"
return response

def AddEmpAction(request):
if request.method == 'POST':
global username
ids = request.POST.get('t1', False)
name = request.POST.get('t2', False)
phone = request.POST.get('t3', False)
desg = request.POST.get('t4', False)
sal = request.POST.get('t5', False)
output = "none"
con = pymysql.connect(host='127.0.0.1',port = 3306,user = 'root', password = 'root',
database = 'emp_attendance',charset='utf8')
with con:
cur = con.cursor()
cur.execute("select employeeID FROM employee_details")
rows = cur.fetchall()
for row in rows:
if row[0] == empid:
output = ids+" employee already exists"
break
if output == 'none':
db_connection = pymysql.connect(host='127.0.0.1',port = 3306,user = 'root', password =
'root', database = 'emp_attendance',charset='utf8')
db_cursor = db_connection.cursor()
student_sql_query                       =                   "INSERT                 INTO
employee_details(employeeID,empployeeName,phoneNo,designation,emp_salary)
```

```
VALUES('"+ids+"','"+name+"','"+phone+"','"+desg+"','"+sal+"')"
db_cursor.execute(student_sql_query)
db_connection.commit()
url = pyqrcode.create(ids)
url.png('EmployeeAttendance/static/qrcodes/'+ids+'.png', scale = 6)
username = ids
print(db_cursor.rowcount, "Record Inserted")
if db_cursor.rowcount == 1:
output = 'Emp Details Saved with ID : '+ids
context= {'data':output}
return render(request, 'Download.html', context)
```
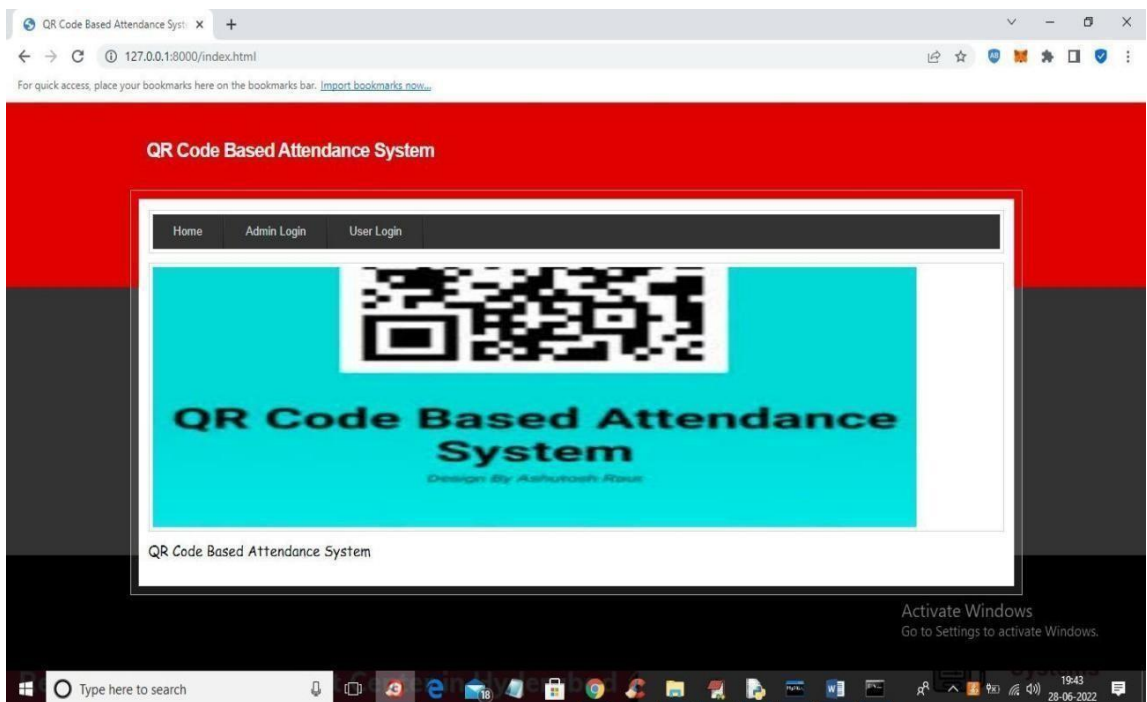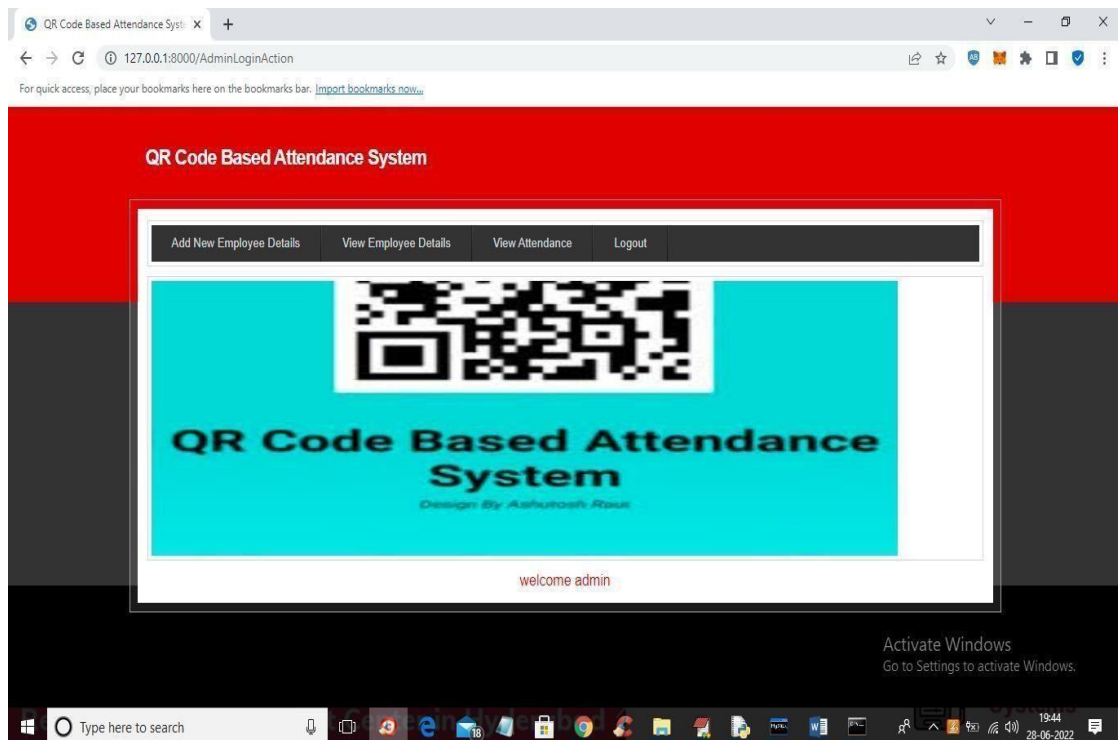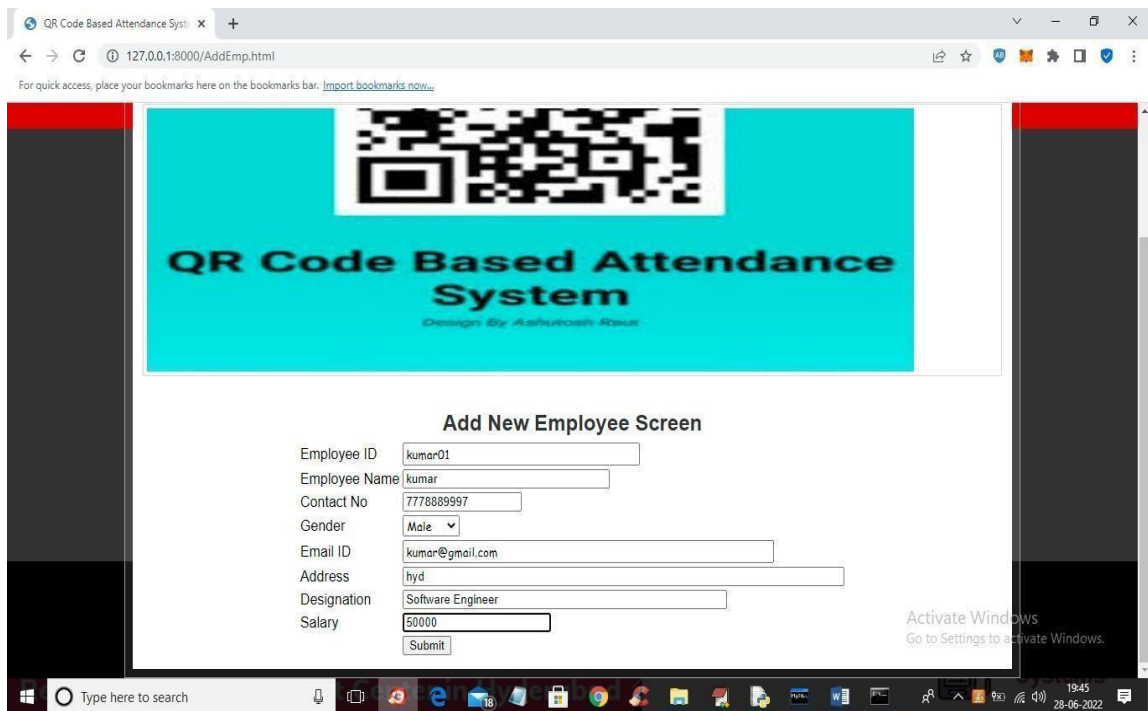
# 5.SCREENSHOTS

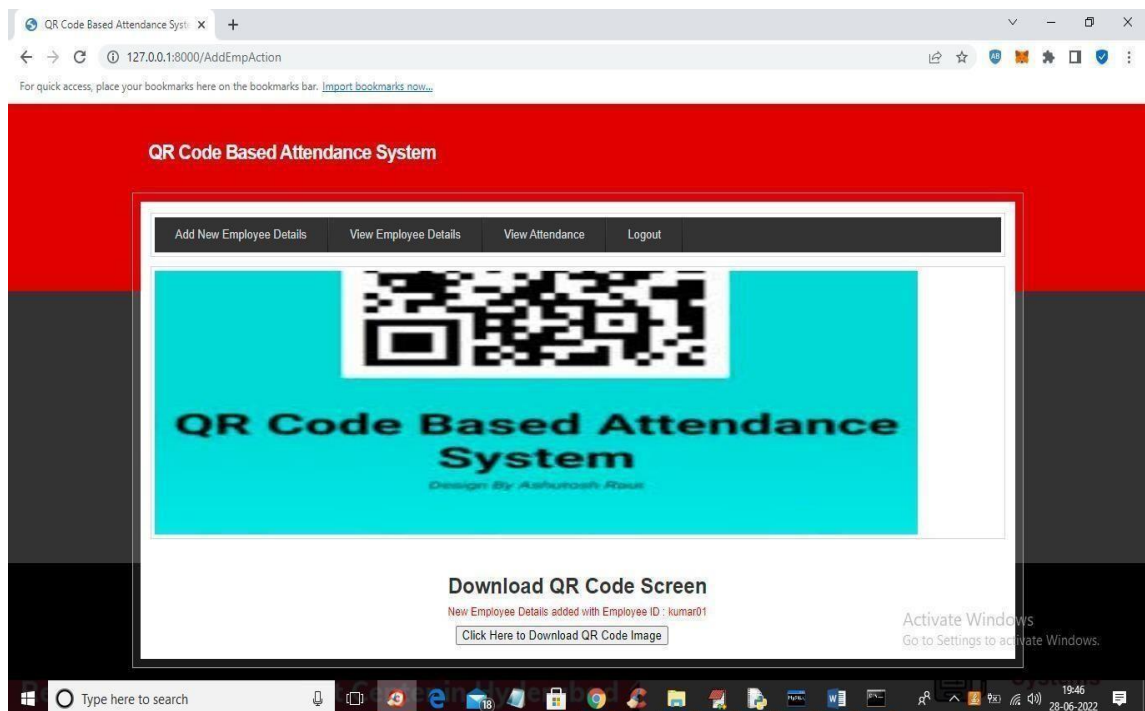Screenshot 5.1: Python Web Server



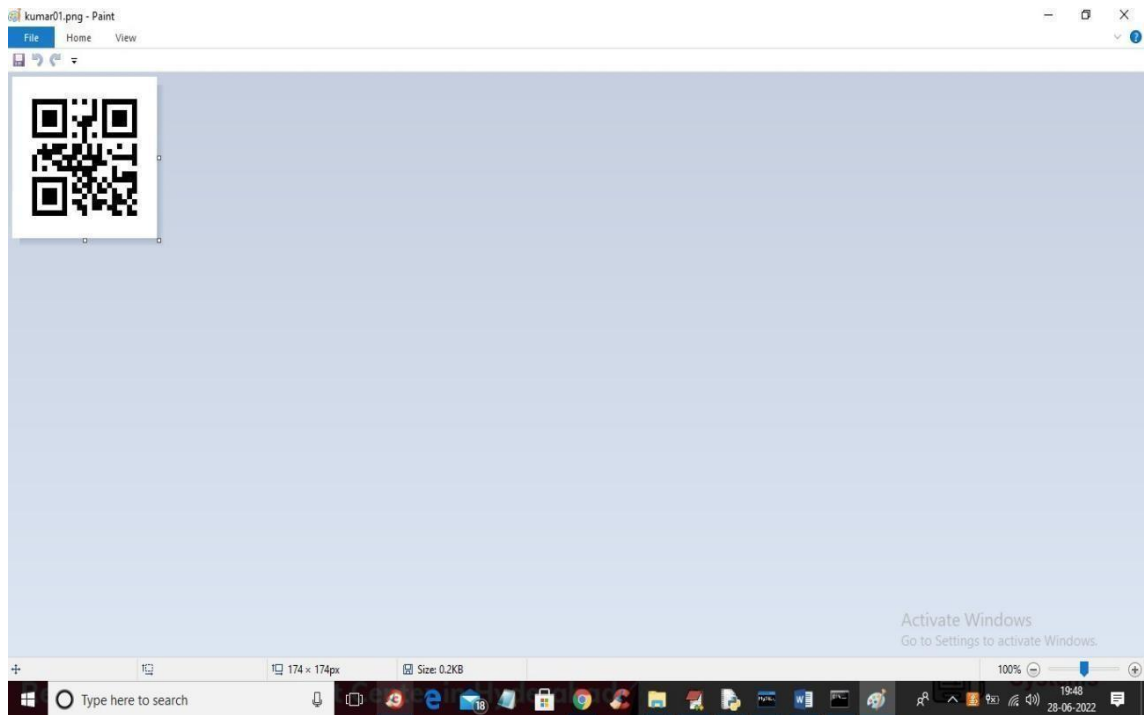Screenshot 5.2: Home page

Screenshot 5.3: Admin Login Screen
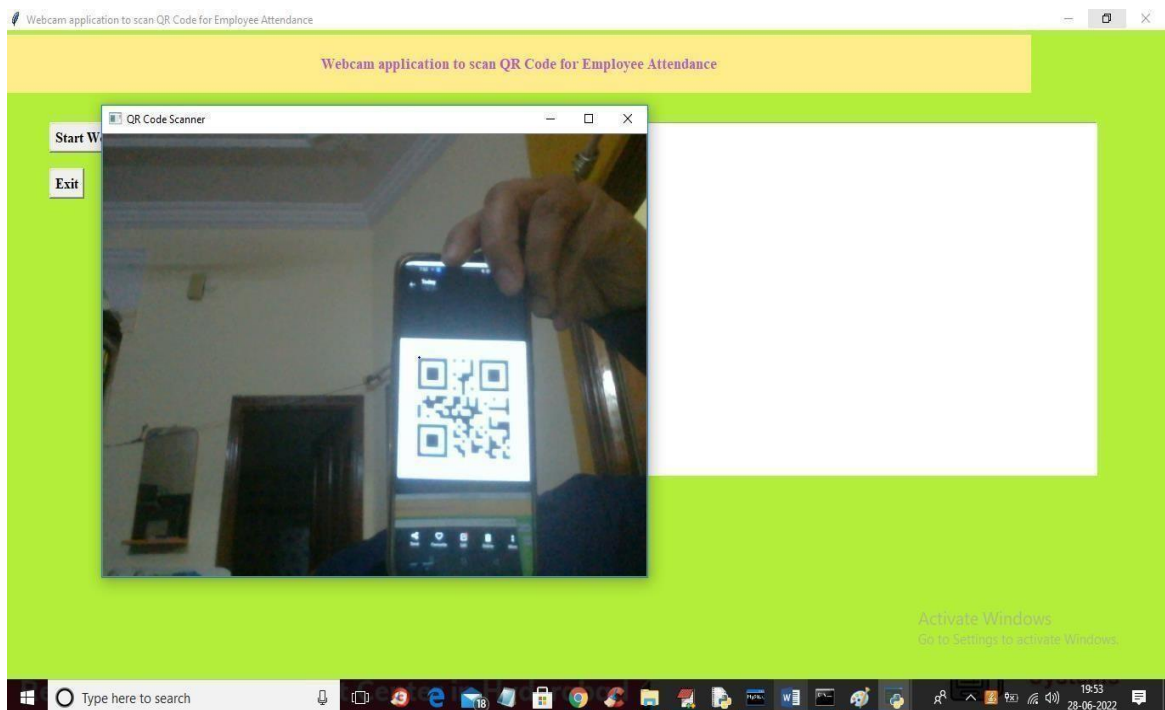


Screenshot 5.4: Employe Details

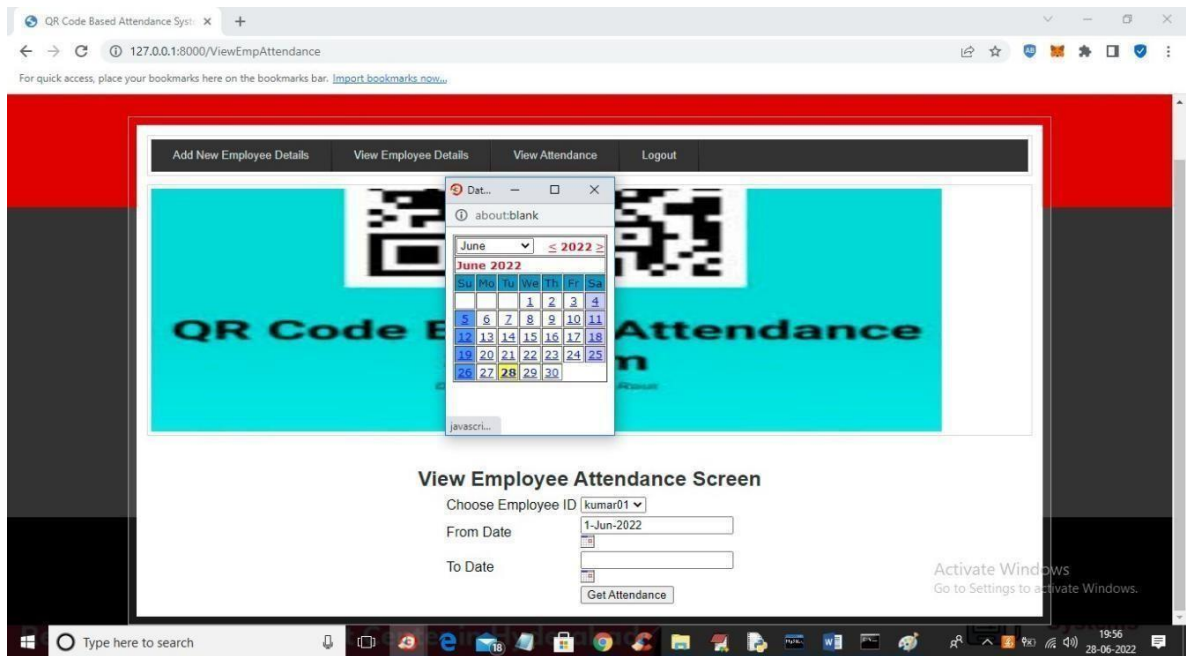Screenshot 5.5: Adding Employee Details



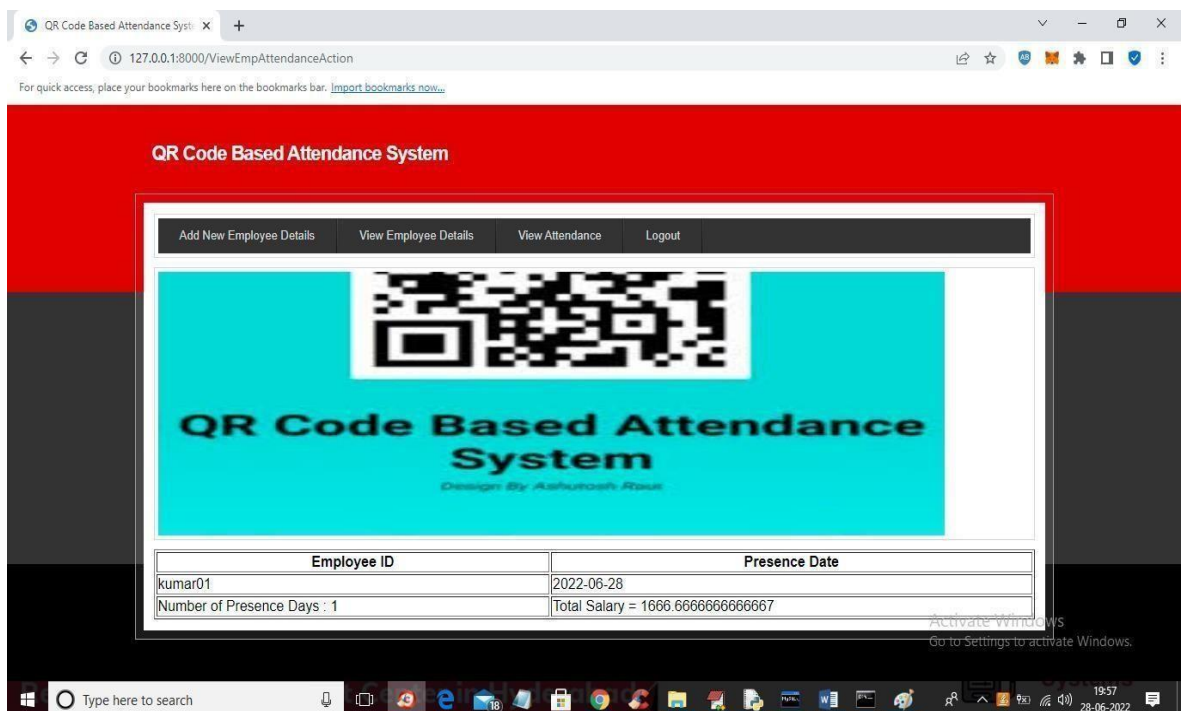Screenshot 5.6: Download QR Code Screen

Screenshot 5.7:Screen  QR Code Image



Screenshot 5.8: QR Code Detection

Screenshot 5.9: View Employee Attendance Screen



Screenshot 5.10: View Employee Attendance

# 6.TESTING

# 6. TESTING

## 6.1 INTRODUCTION  TO  TESTING

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable  fault or weakness in a work product. It provides a way tocheck the functionality of components, sub assemblies, assemblies and/or a finished product It is the process of  exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

## 6.2 TYPES OF TESTING

### 6.2.1 UNIT TESTING

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it  is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction andis invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performsaccurately to the documented specifications and contains clearly defined inputs and expected results.

### 6.2.2 INTEGRATION TESTING

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the combination of components is correct and consistent.Integration testing is specifically aimed at exposing the problems that arise from  the combination of components.

### 6.2.3 FUNCTIONAL TESTING

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items:

Valid Input             : identified classes of valid input must be accepted.

Invalid Input           : identified classes of invalid input must be rejected.

Functions               : identified functions must be exercised.

Output                  : identified classes of application outputs must be exercised.

Systems/Procedures : interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

## 6.3 TEST CASES

### 6.3.1 CLASSIFICATION

| S.NO | Test Case | Excepted Result | Result | Remarks (IF Fails) |
|------|-----------|-----------------|--------|--------------------|
| 1 | User Register | If user registration successfully. | Pass. | If already user email exist then it fails |
| 2 | User Login | If username and password is correct then it will getting validpage. | Pass | Un Register Users will notlogged in. |
| 3 | User View User | Show our dataset.t | Pass | If Data set not Displayed fail. |
| 4 | View Fast HistoryResults | The Four Alarm Should be Displayed. | Pass | The Four AlarmScore Not Displayed fail. |
| 5 | User Prediction | Displayed Review with true results. | Pass | Results Not trueFail |

| 6 | Show Detection process | Detection process | Pass | Results Not true Fail |
| 7 | Show Eye Blink Process | Display Eye Blink Process | Pass | If Results not Displayed Fail |
| 8 | Admin login | Admin can login credential. If success he get his home page. | Pass | Invalid login details will not allowed here. |
| 9 | Admin can activate the register users | Admin can activate the register user id | Pass | If user Id not found then it won't login |
| 10 | | Accuracy and F1 Score | | Displayed fail |

# 7. CONCLUSION

# 7.CONCLUSION & FUTURE SCOPE

## 7.1 PROJECT CONCLUSION

QR code-based attendance systems have become increasingly popular in recent years as they offer an efficient and convenient way to manage attendance in various settings such as schools, universities, and workplaces. One of the main advantages of QR code-based attendance systems is that they are fast and easy to use. Another benefit of QR code- based attendance systems is that they reduce the likelihood of errors and fraud. Overall, QR code-based attendance systems can be an effective and efficient way to manage attendance, but they should be implemented carefully and with consideration for the potential limitations and challengesinvolved**.**

## 7.2 FUTURE SCOPE

Our future work will focus on providing missed class topics and notes available to students. Full control to professor with more secured and enhanced options.

Finally we conclude, if we integrates this attendance monitoring system with Face identification tool then system will solve the real world attendance problem.

# 8.BIBLIOGRAPHY

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## 8.2  GITHUB  LINK

https://github.com/saiashritha01/QRcode-Attendance-system