STUDENT ATTENDANCE SYSTEM USING BARCODE

Submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering Degree in Computer Science and Engineering

by

Pavithra. S (38290063)

Pavithra. V (38290064)

DEPARTMENT OF COMPUTER SCIENCE
ANDENGINEERING SCHOOL OF COMPUTING

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited with Grade "A" by NAAC

JEPPIAR NAGAR, RAJIV GANDHI SALAI,
CHENNAI-600 119, TAMILNADU.

APRIL - 2021

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited with Grade "A" by NAAC
(Established under section 3 of UGC Act, 1956)
Jeppiar Nagar, Rajiv Gandhi Salai, Chennai-600 119.

www.sathyabama.ac.in

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **Pavithra. S (38290063)** and **Pavithra. V (38290064)** who carried out the project entitled "Student Attendance System Using Barcode Scan" under our supervision from November 2020 to April 2021.

Internal Guide
Dr. B. ANAKAYARKANNI M.E., Ph.D.

Head of the Department

Submitted for Viva Voice Examination held on

Internal Examiner External Examiner

DECLARATION

Pavithra.S (Reg No.38290063) and **Pavithra.V (Reg No. 38290064)** hereby declare that the Project Report entitled **"Student Attendance System Using Barcode"** done by us under the guidance of **Dr. B. Ankayarkanni M.E.,Ph.D.** is submitted in partial of the fulfillment of the requirements for the award of Bachelor of Engineering Degree in Computer Science and Engineering.

DATE :
PLACE : CHENNAI Signature of the Candidate

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr . T. SASIKALA, M.E., Ph.D.,** Dean, School of Computing and **Dr .S.VIGNESHWARI M.E., Ph.D.,** and **Dr . L. LAKSHMANAN, M.E., Ph.D.,** Head of the Department, Department of Computer Science and Engineering for providing us necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to our Project Guide **Dr. B. ANKAYARKANNI M.E.,Ph.D.,** for her valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Computer Science and Engineering** who were helpful in many ways For the Completion of the project.

ABSTRACT

All academic institutions have certain criteria for students regarding their attendance in class and examinations. The importance of student attendance in class cannot be over emphasized, as a result of this, administrators and lecturers of various academic institutions are concerned with the attendance irregularities.

In the process of admitting students into an examination hall, 70% of attendance must be met and also considered for grade computation, therefore there is a huge need for monitoring and recording students' attendance. This brings about the need to have a tool to control students' attendance. The existing model of manual attendance monitoring (using paper sheets and an old file system) is not efficient and it is also time consuming. These aforementioned shortcomings among others serve as justification for migrating from manual based to the proposed system. The system is based on qr code technology and the details of this system are presented in this paper. The system can be easily accessed by the lecturers and most importantly, the reports can be generated in real-time processing, thus, providing valuable information about the students.

(Keywords: attendance management, Barcode scanner, ID card, academic institution, examination management)

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ABBREVIATIONS

ABBREVIATIONS	EXPANSION
RFID	Radio Frequency Identification
SQL	Structured Query Language
SAS	Student Attendance System

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW OF PROJECT

It is well known fact that virtually all organizations whether commercial or educational need to maintain a properly record the attendance of its employees or students for effective functioning, planning, and management of the organization. In most academic institutions in developing countries, attendance is usually taken manually using paper sheets and the old file system approach by calling students' name.

According to it becomes troublesome for the management to regularly update the records and manually calculate the percentage of classes attended for the purpose of examinations and subsequent results processing. Lack of adequate attendance record keeping has indeed degenerated to a greater level. Many academic institutions are beginning to update their standards by issuing students with identification cards that are equipped with barcodes, ID chips, radio frequency identification (RFID) tags, and so on. This decision opens up a window to implement barcode identification systems in classrooms as a management tool to solve many of the problems faced by lecturers and the institutions' management in classroom attendance management.

Due to the inefficiency of traditional methods of attendance record keeping, a more secure and accurate barcode technology model is needed to be formulated and implemented. Barcode Identification is one of the automatic identification technologies more in vogue nowadays. A barcode is an optical machine-readable representation that contain data relating to the object in which it is attached. Initially barcodes were systematically use to represent data by changing the widths and spacing of parallel lines, and this kind of pattern is referred to as linear or one dimensional (1D).

Later they emerge into rectangles, dots, hexagons and other geometric patterns in two dimensions (2D). Although 2D systems use difference variation of symbols, they are also referred to as barcodes as well. Barcodes originally were recognized by

special optical scanners called barcode readers. Since their inception, barcodes were credited to Joseph Woodland (Charles, 2001), the concept of barcodes have grown from the initial linear barcodes "one dimensional" to the Matrix code "two dimensional"

and this invention have been applied to many areas of life which include supermarkets, pharmacies, warehouses, libraries, and shopping centres.

CHAPTER 2

LITERATURE SURVEY

There are numerous proposals for Automatic Attendance Management Systems in the literature and in the market. Nowadays, barcodes are frequently used in most industries, supermarkets, and wherever information needs to be read automatically.

Shoewu, Olaniyi, and Lawson (2011) proposed an electronic card-based solution to the lecture attendance problem in higher institutions in the developing countries. This system used a single-chip computer based on subsystems interfaced serially to the serial port of the digital computer. Some of the limitations of this system are that not all computer systems possess serial port.

Mahyidin (2008) also proposed student attendance management system using Radio Frequency Identification (RFID). The system makes use of student card in order to grant or denial the student from taking attendance. This technique also did not identify individual based on who he/she is which therefore, can lead to impersonation.

Victor, Jonathan, Reece, and Lemire (2003) presented a system that is based on student wolf pack club tracking system to improve the process of student wolf pack club ticket distribution for athletic events. This system did not, however, integrate any aspect of student attendance monitoring.

On the other hand, Saraswat and Kumar (2010), proposed fingerprint verification technique in taking attendance. Their proposed system makes use of fingerprint verification by using extraction of minutiae technique and system that automates the whole process of taking attendance.

Xue (2009), discusses a prototype system that uses facial recognition technology to monitor and authenticate user or student for attendance taking. A neural network-based algorithm was implemented to carry out face detection, and an eigen face method was employed to perform facial recognition. The

experimental results demonstrate the feasibility of near-real-time continuous user verification for high-level security information systems.

2.1 Existing System

The existing system is a manual entry for the students. Here the attendance will be

recorded in hand written registers. It usually is a tedious job to maintain the records for the users. The retrieval o f the information is not as eas y as the records are maintained in the hand written registers.

Registration systems are implemented in many institutions for various reasons. While the purpose of these systems is not a focus in this paper, it is clear that statistical information is required by most of those institutions that have a large number of students.

Since collecting attendance data in many institutions has not been computerized, the proposal of transforming the present system was alluring and decided to face the challenge and design a solution for it.

In the present attendance registration system, teachers have to either ask the students to write down their names on a piece of paper, or they have to provide a list of enrolled students and ask them to mark their names. This means that excessive manual efforts go into the process of classroom attendance registrations.

After the data has been collected, it takes even more time and efforts to transfer the data onto other systems for data analyses. One of the major flaws of the present system is the fact that, attendance registration information is not properly used to help improve course timetables and classroom bookings. Another important piece of information which the present system lacks is the time of individual attendance records. For example, a question of whether the majority of students were present at the beginning of a class or at later times could help in improving classroom related research.

2.2 Problems of Existing System

- The existing model of manual attendance monitoring (using paper sheets and an old file system) is not efficient and it is also time consuming.
- According to survey it becomes difficult for management to regularly update the records.
- By calculating the attendance percentage manually for the examinations and reports, errors may occur possibily.

- These errors will affect the students academic performance record.
- Suppose the wrong inputs are entered, the user finds it difficult to use.

CHAPTER 3

METHODOLOGY

3.1- Aim of the Project

To overcome the manual attendance issues, we proposed and implemented a smart attendance system with the aim to encourage the potential use of the barcode as a future attendance management system, to track and record student attendance.

3.2- Scope and Objective

Each barcode represents a unique id of students. Students just have to scan their cards using barcode scanner and the system notes down their attendance as per dates. System then stores all the student's attendance records and generates defaulter list. It also generates an overall report in excel sheet for admin.

3.3- Proposing System

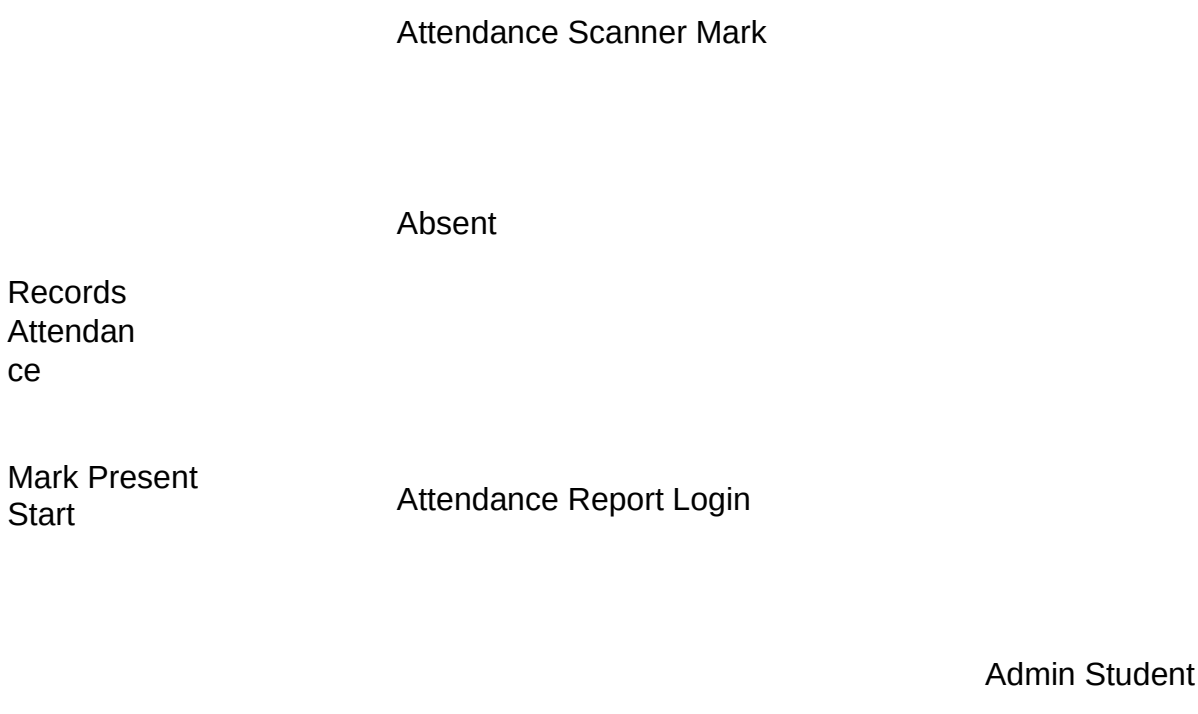
We are using python language for this project. This study focused on reducing effort on paper work and save the time required to generate accurate results from the student's attendance. The proposed system of attendance management is implemented using barcode technology. For this work, students have to sign in electronically with ID card at the beginnings of each class. Each student has their own ID card to fill in class attendance signing system.

By using this system, students can discipline themselves to always carry their student ID card as it is compulsory for attendance marking. The barcode reader reaches the barcode on the ID card and record the data in the server. In that way, data can be processed immediately and in a totally automated way. At the end of the semester, lecturers can get the calculation of the students' attendance percentage more efficiently and view the standard attendance report.

Bar code scanner used to scan the student card which contains the student identification number. The register number then send to the attendance system and it will remain displaying student record for 5 seconds before change to the state to

accept another student card number. Each recorded data will be sent to the database which developed using database processing application. Structured query language (SQL) used to query data to produce various kind of student attendance report. Students' attendance system (SAS) helps them to find the record easily.

3.4-ARCHITECTURE DIAGRAM



Attendance

Stop

3.4.1 Attendance Scanner

- Attendance scanner is the part of the application that represents the presentation of this scanner.

- It is created to scan the barcode of the students.

3.4.2 Records Attendance

- Attendance recorder is the part of the application that records the attendance of the students.

Mark Present: Those who show the barcode, will be marked as present.

Mark Absent: Those who didn’t show the barcode, by default it will be marked as absent.

3.4.3 Attendance Report

- Attendance report is the part of the application that handles the overall report of the attendance.

- From the above instructions, it is responsible for maintaining datas of the students.

3.4.4 Login

In login page there will be two module, admin and student module. 

Fig No 3.4.4

3.4.5 Admin Module

- Admin has the control to add or modify the overall reports of the students.

- Admin module handles the course updates, student datas and manage the overall reports of the staffs, students & attendance.

- Admin can also view all the datas to generate the reports for the future use.

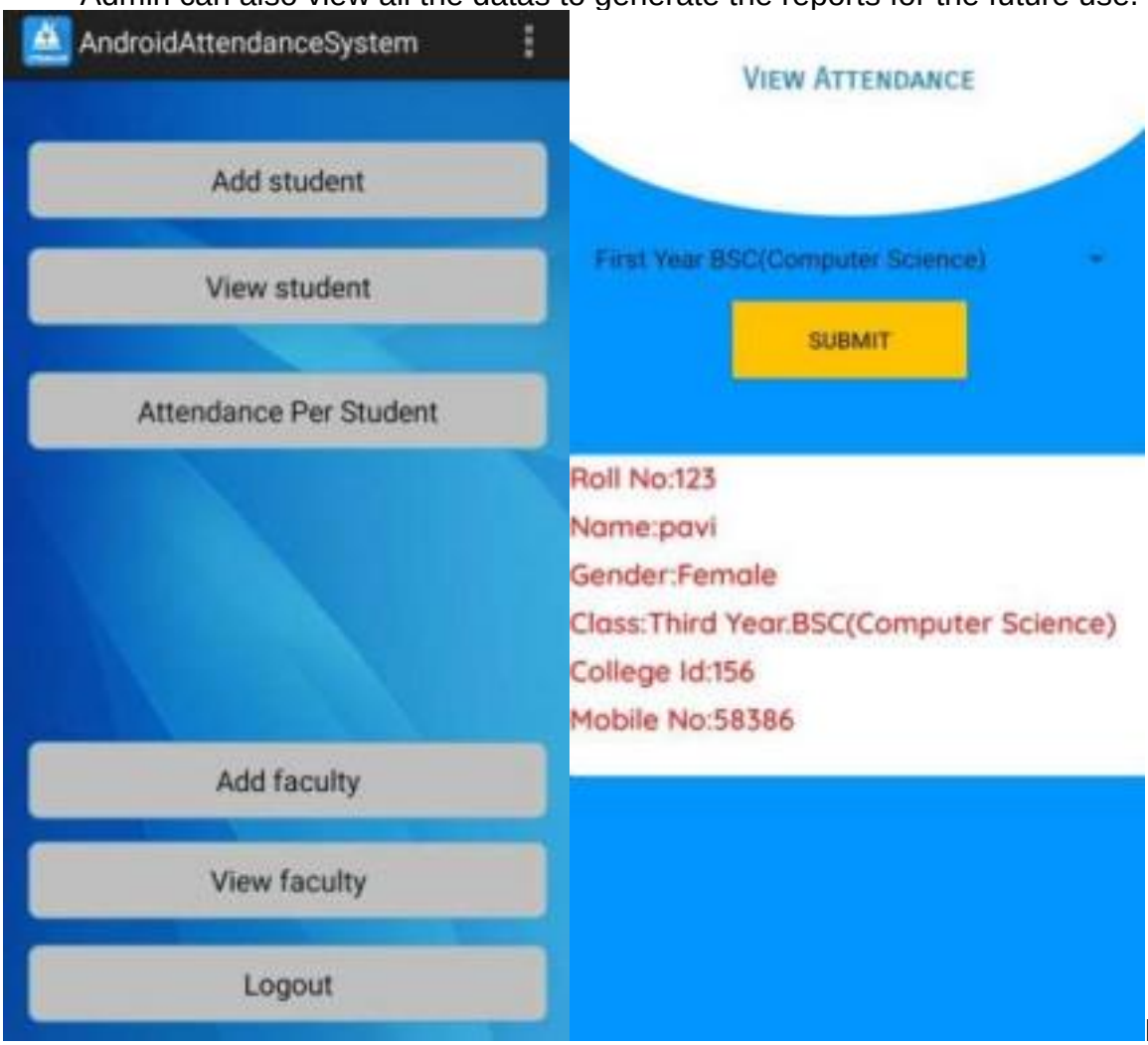


Fig No 3.4.5

3.4.6 Student Module

- In students module, they can verify their attendance and course details. • Students can also view their attendance percentage for examination results.

Fig No 3.4.6

3.5 System Requirements

i) Software Requirements

- Windows 7,8,10
- My SQL 2008
- PyCharm

ii) Hardware Requirements

- Processor-i5
- Hard disk-8 GB
- Memory-4 GB RAM
- Attendance scanner

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Working

The system should be designed in such a way that only authorized people should be allowed to access some particular modules. The records should be modified by only

administrators and no one else. The user should always be in control of the application and not the vice versa. The user interface should be consistent so that the user can handle the application with ease and speed. The application should be visually, conceptually clear.

Students will be more regular in attending their classes since now no attendance sheet signature is required, so no friend or any other student can make an attendance on behalf of other as barcodes are unique for every student.

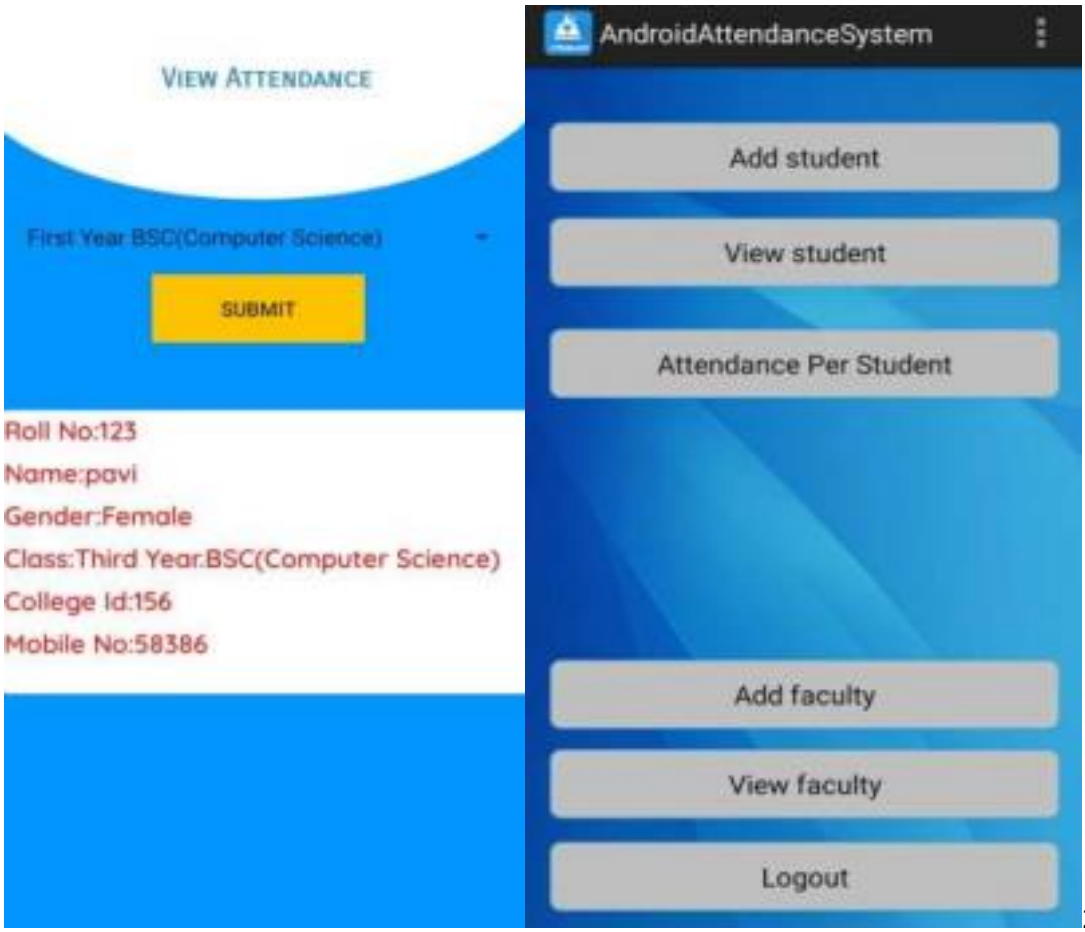
Teachers do not need to waste their time approximately 15min of 1hour for taking attendance of students. No need to maintain attendance sheet as the attendance are electronically stored in database. The system helps the faculty to easily find out defaulters. User may easily get attendance history of a particular student. It saves time, cost, efforts and institute resources.

4.2 Analysis of Result

Result design for this application “Student Attendance Management System” generally refers to the reports and information that are generated by the system from many end-users; result is the main reason for developing the system and the basis on which they evaluate the usefulness of the application.

The output is designed in such a way that it is attractive, convenient, and informative. Forms are designed with various features, which make the console output more pleasing. As the outputs are the most important sources of information to the users,

better design should improve the system's relationships with user and also help in decision making. Form design elaborates the way output is presented and the layout available for capturing information.



CHAPTER 5
CONCLUSION

School attendance determines the academic achievement of a student. Student attendance system can reduce the time spent by teacher in calculating the percentage of attendance for a student as well as for a class.

Computerizing classroom attendance tracking has many advantages over the old system. Data from classrooms can easily be transformed into databases for possible later analyses or usages. This may help in improving the design of timetables and classroom reservation decisions.

A major disadvantage, however, is maintaining the software program of the system. The goal of this work was to test and evaluate a real-time, system using barcode on students ID card. The results from the tests that were conducted on the system

collectively show that the system design is suitable for technological challenges that require real-time solutions. Furthermore, the success of these tests left no doubt that barcode solutions are easy to implement, inexpensive in terms of cost, and effective in terms of reliability and efficiency. A minor concern, however, might be in the area of maintenance.

REFERENCES

1) Wright, A.W. 2011. “Radio Frequency Identification Classroom Management System”. B. Sc. project, California Polytechnic State University. http://digitalcommons.calpol.edu/imesp/70 Retrieved on Dec. 20th, 2015.

2) Application Notes. 2008. “Introduction to RFID Technology”. CAENRFID: The Art of Identification.

3) Fisherman, C. 2001. “The Killer App - Bar None”. Retrieved 2010-04-19.

4) Mahyidin, M. 2008. “Student Attendance Using RFID System”. Thesis, Electrical and Electronics Engineering Department, University of Malaysia, Pahang. Retrieved March 2nd, 2015.

5) Kassim, M. H. Mazlan, N. Zaini, and M.K. Salleh. 2012. “Web Based Student Attendance System Using RFID Technology”. 2012 IEEE Control and System Graduate Research Colloquium, no. Icsgrc, pp. 213–218.

6) Saraswat, C. and Kumar, A. 2010. “An Efficient Automatic Attendance System Using Fingerprint Verification Technique”. International Journal on Computer Science & Engineering. 2(2):264-269.

7) Seideman, T. (n.d.). “Barcodes Sweep the World. Wonder of Modern Technology”.

8) Shoewu, O., O.M. Olaniyi, and A. Lawson. 2011. “Embedded Computer-Based Lecture Attendance Management System”. African Journal of Computing & ICT. 4 (3): 27- 36.

9) Tabassam, N., P. Saim, K. Arash, and K. Azhar. 2009. “Development of Academic Attendance Monitoring System Using Fingerprint Identification. International Journal of Computer Science and Network Security. 9(5):164-168.

10) Lim, T.S., S.C. Sim, and M.M. Mansor. 2009. “RFID Based Attendance System”.Oct.2009 IEEE Symposium on Industrial Electronics and Applications, No. Isiea.778–782.

11) Victor, S., M. Jonathan, J. Reece, and J. Lemire. 2003. “Student Wolf Pack Club Tracking System”. North Carolina State University.

12) Xue Dong Yang. 2009. “A Facial Presence Monitoring System for Information Security, Computational Intelligence in Biometrics: Theory, Algorithms, and Applications”. CIB 2009. IEEE Workshop on, March 30 2009-April 2 2009, 69 – 76.

13) Zatin Singhal and Rajneesh Kumar Gujral. 2012. “Anytime Anywhere- Remote

Monitoring of Attendance System Based on RFID using GSM Network". International Journal of Computer Applications (0975 – 8887): 39 (3).

14) Yong, Z.Q. and L. Ji. 2006. "The Design of Wireless Fingerprint Attendance System. 2006". International Conference on Communication Technology. 1–4.

APPENDICES

A. Source code

```
import qrcode as qr
with open ('QR_GEN','r') as gen:
 Reading_name = gen.readlines()
 for names in Reading_name:
 name = names.replace("\n",'')
 img = qr.make(name)
 img.save(f"{name}.jpg")
print("QR code generated for all students")
```

```
import cv2 as cv
from pyzbar.pyzbar import decode
import numpy as np
import time

original_name_list = []
Total_list = []
```



```
with open('student.txt', 'w') as notes:
 notes.write("")

with open('QR_GEN', 'r') as gen:
 Reading_name = gen.readlines()
 for names in Reading_name:
 original_name_list.append(names.replace("\n", ''))
def write_data(name):
 if name not in Total_list:
 Total_list.append(name)
 with open('student.txt', 'a+') as notes:
 name ="".join(str(name))
 notes.write(name+ '\n')
```

```
 return Total_list



def check_names(name):

 if name in original_name_list:

 if name not in Total_list:

 print('\n' + "Total students = " + str(len(Total_list)+1) + '\n' + '!! You are
Marked present !! ')

 write_data(name)
```



```
 else:

 print('!! You are not enrolled in the Class !!')

time.sleep(2)



video = cv.VideoCapture(0)



while True:

 _, frame = video.read()



 for barcode in decode(frame):

 # print(decode(frame))

 present_name = barcode.data.decode('utf-8')  pts

= np.array([barcode.polygon], np.int32)  pts =

pts.reshape((-1, 1, 2))
```

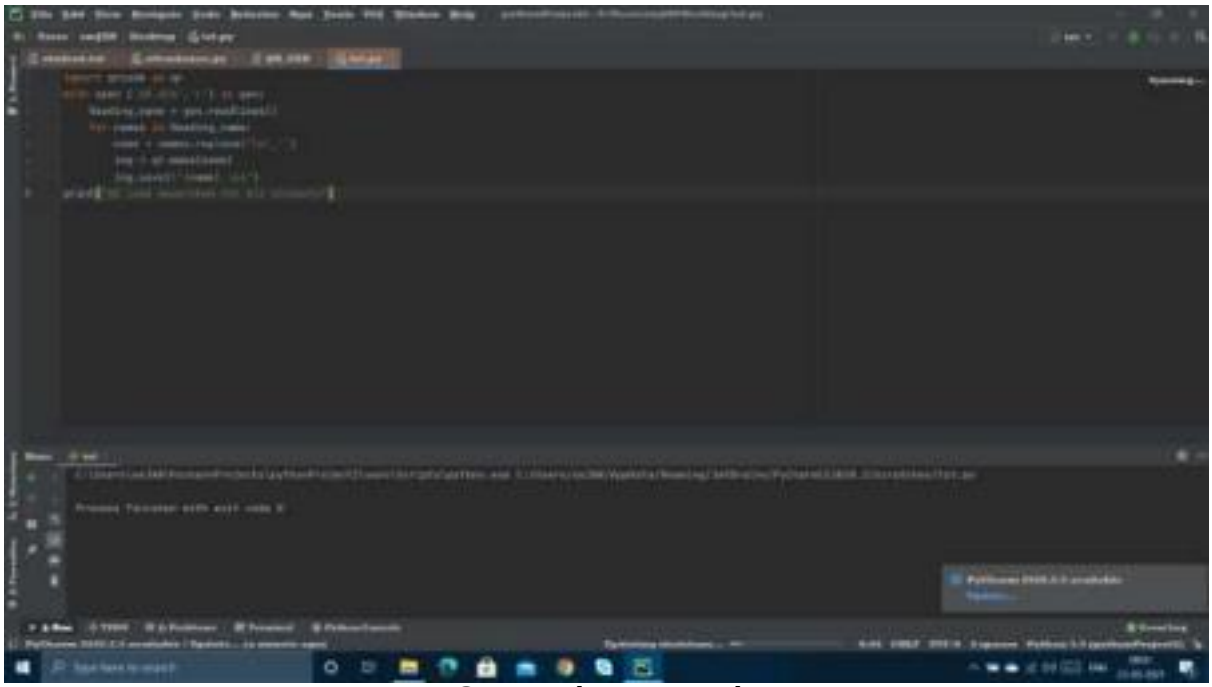
```
 cv.polylines(frame, [pts], True, (255, 0, 0), 2)
check_names(present_name)
 cv.imshow('Attendance Monitor', frame)

 if cv.waitKey(20) & 0xFF==ord('s'):
 break
```

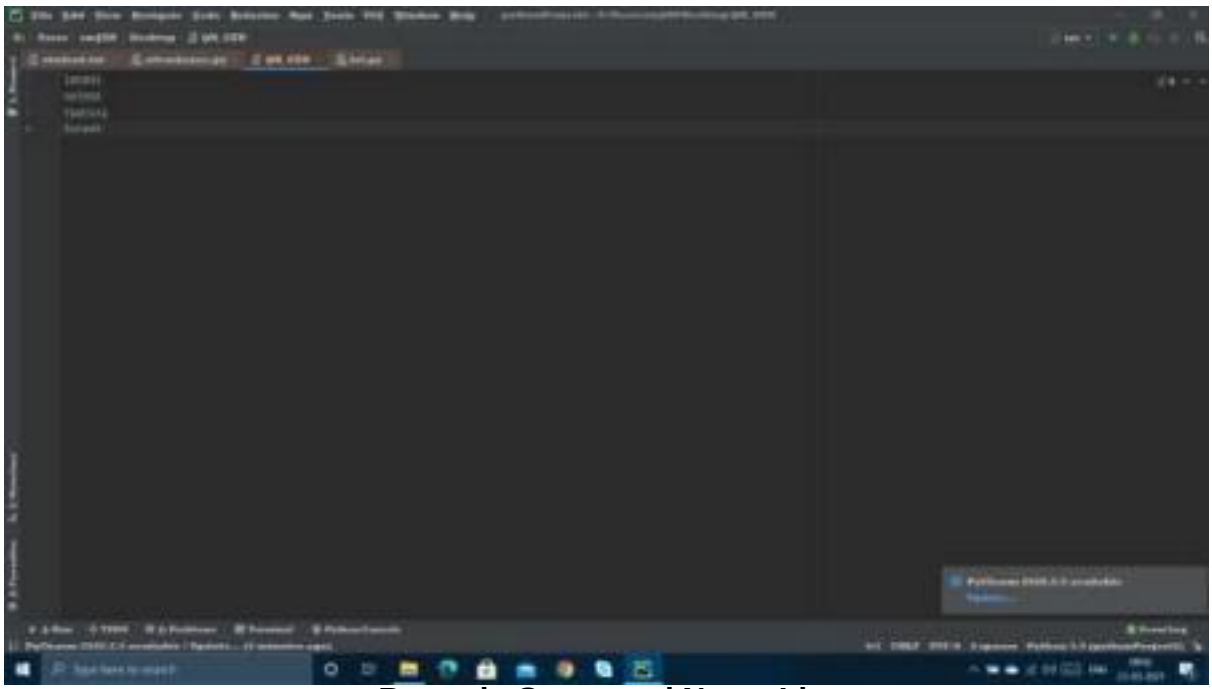


```
for iterate in original_name_list:
 if iterate not in Total_list:
 with open('student.txt', 'a+') as notes:
notes.write(iterate + '' - ABSENT'' + '\n')
video.release()
cv.destroyAllWindows()
```

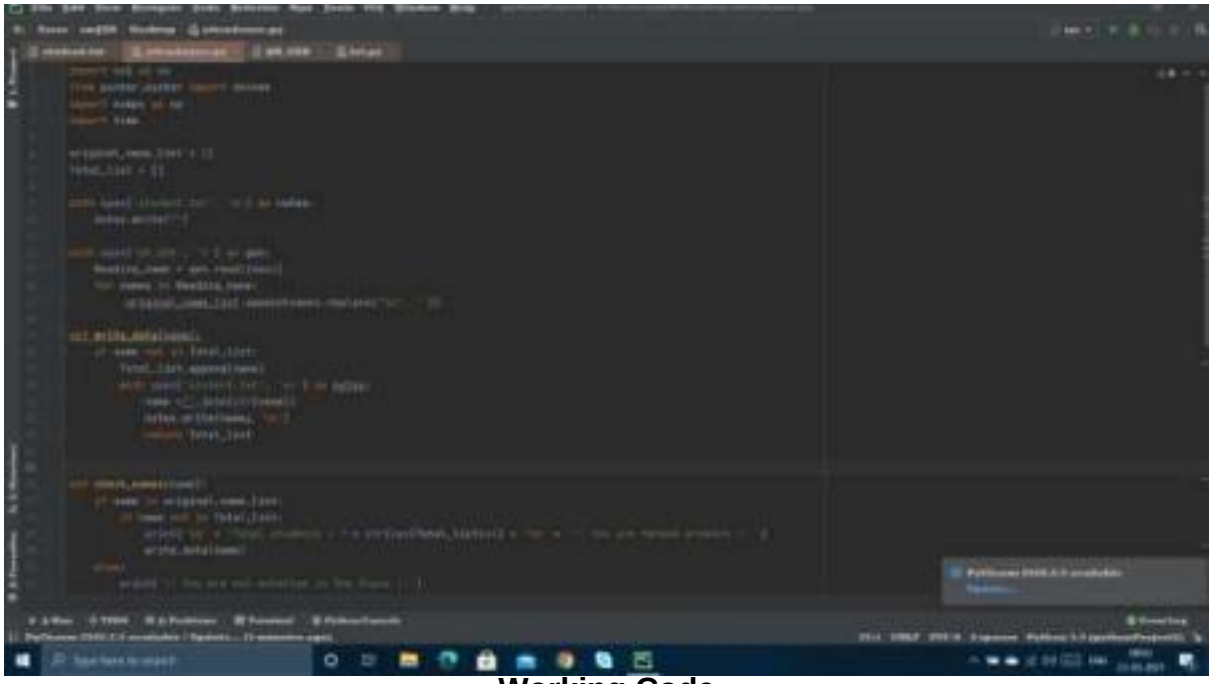
B. Screenshots



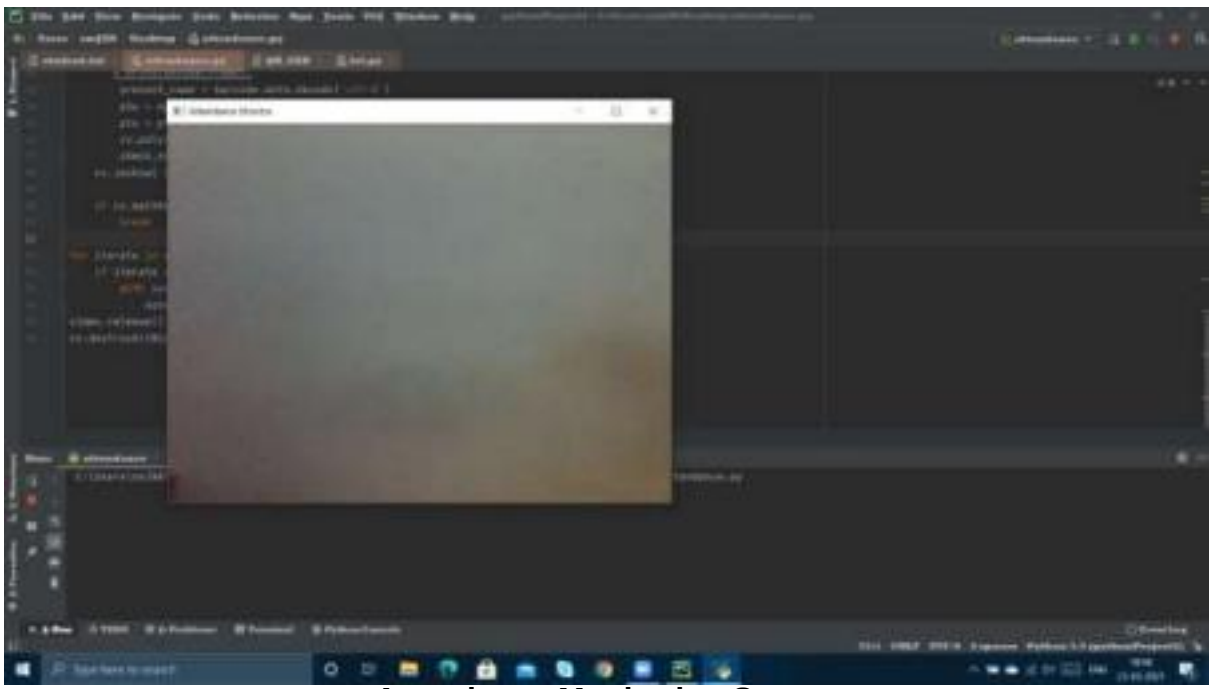
Generating Barcode



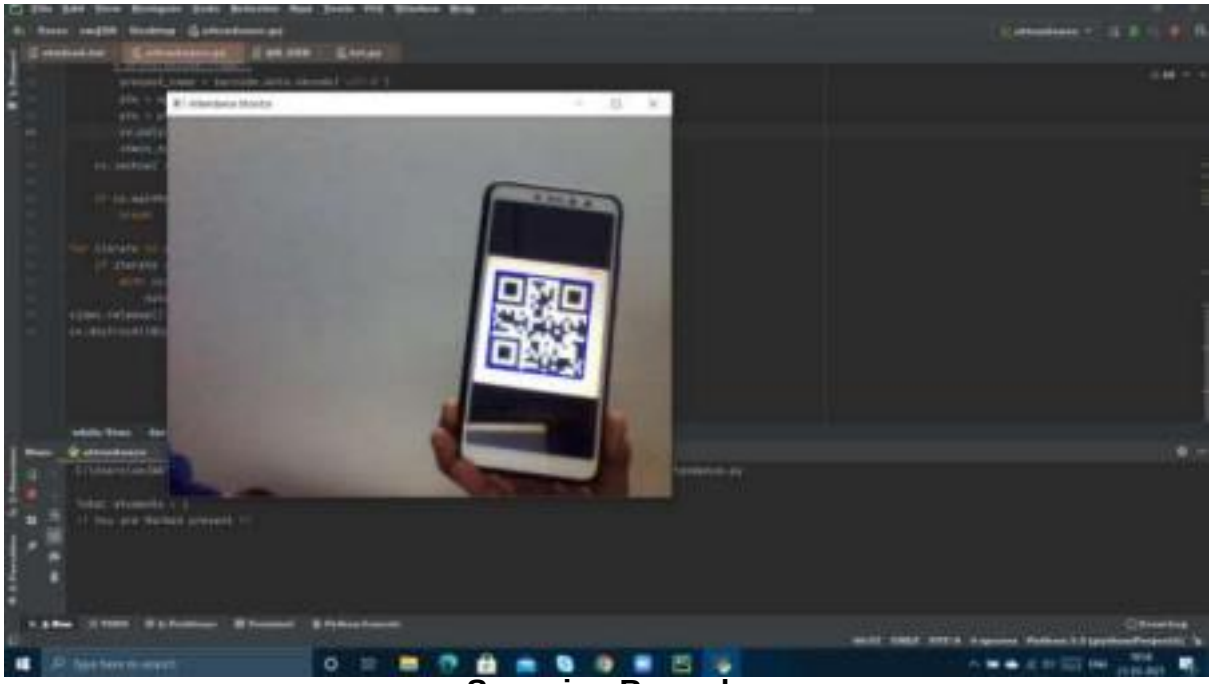
Barcode Generated Name List



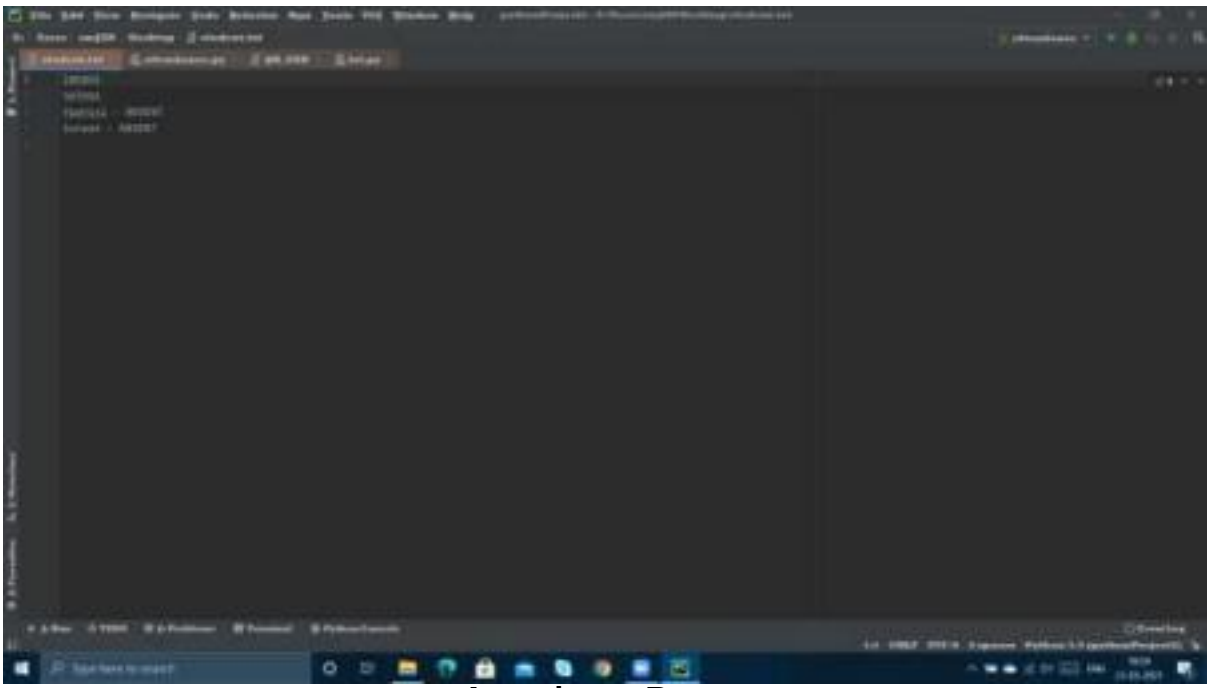
Working Code



Attendance Monitoring Screen



Scanning Barcode



Attendance Report