
# J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY YMCA, FARIDABAD

## Depratment of Computer Engineering

**PROJECT REPORT ON**

# " 3C Parking Solution "

**Presented to :-**

**Prof. Atul Mishra**

**Supervised by :-**

**Dr. Umesh**

**Design & Developed by :-**

**Akash**

**(19001003503)**

**Nitish**

**(19001003509)**

**Class : CE 71**

# ACKNOWLEDGEMENT

We thank the people who were a part of this project in numerous ways, people who gave their unending support right from the stage the project idea was conceived.

The four things that go on to make a successful endeavour are dedication, hard work, patience and correct guidance.

We would like to thank our mentor **Dr. Umesh** who has always been the source of inspiration.

We are also thankful to **Prof. Atual Mishra** our project coordinator for all the help he has rendered to ensure the successful completion of the project.

We take this opportunity to offer sincere thanks to **Dr. Umesh** who was very much kind enough to give us an idea and guide us throughout our project work.

We are also thankful to **Dr. Umesh** and **Prof. Atual Mishra** for helping us out in Project Documentation.

We are thankful to all teaching staff (C.E) who shared their experience and gave their suggestion for developing our project in better way.

Last but not the least we would like to thank all our friends and family and family members for their support, and all others who have contributed to the completion of this project directly or indirectly.

# CANDIDATE'S DECLARATION

I hereby certify that the work which is being carried out in this Minor Project titled **"3C Parking Solution**" in fulfilment of the requirement for the degree of Bachelor of Technology in Computer Engineering and submitted to **"J. C. Bose University of Science and Technology, YMCA, Faridabad"**, is an authentic record of my own work carried out under the supervision of Dr. Umesh.

The work contained in this thesis has not been submitted to any other University or Institute for the award of any other degree or diploma by me.

Akash

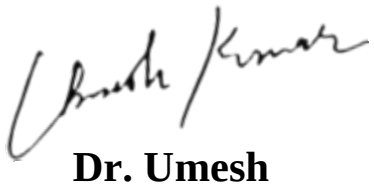
(190010003503)

Nitish

(190010003509)

# CERTIFICATE

This is to certify that the work carried out in this project titled **"3C Parking Solution"** submitted by Akash & Nitish to **"J. C. Bose University of Science and Technology, YMCA, Faridabad"** for the award of the degree of Bachelor of Technology in Computer Engineering is a record of Bonafede work carried out by him under my supervision. In my opinion, the submitted report has reached the standards of fulfilling the requirements of the regulations to the degree



**Dr. Umesh**
(Assistant Professor)
Department of Computer Engg,
J. C. Bose University of Science and Technology, YMCA, Faridabad

# INTRODUCTION

- 3C Parking Solution is for managing the records of the incoming and outgoing vehicles in a parking house.

- As we all know that the world is fighting Covid-19 pandemic, we are here to design and develop a 3-C parking solution for colleges and schools. There is a crucial problem of vehicle parking in these areas. The vehicle parking area has many lanes/slots for car parking. So to park a vehicle one has to look for all the lanes. Moreover this involves a lot of manual labour and investment. Instead of vehicle caught in towing the vehicle can park on safe and security with low cost.

- The objective of this project is to build a Vehicle Parking management system without any sensors that enables the time management and control of vehicles by scanning QR code of user. The system that will track the entry and exit of vehicles, maintain a listing of vehicles within the parking lot, and determine if the parking lot is full or not and it will automatically show the nearest available parking spot for the convenience of the user without any human contact.

# OBJECTIVES

- To create a 3-C parking model that can be very helpful in these pandemic times in schools and colleges. It will provide the location of the available space in parking lot to the user according to their vehicles. This project is based on 3-C requirements of the current pandemic hit world :

  C : Complete
  C : Cheap
  C : Contactless
- Maintain records in short time of period.
- Determines the parking area is full or not.
- Enhances the visitor's experience.

# SCOPE

- In the modern age. Many people have vehicles. Vehicle is now a basic need. Every place is under the process of urbanization. There are many corporate offices and shopping centres etc. There are many recreational places where people used to go for refreshment. So, all these places need a parking space where people can park their vehicles safely and easily. Every parking area needs a system that records the detail of vehicles to give the facility. These systems might be computerized or non-computerized. With the help of computerized system we can deliver a good service to customer who wants to park their vehicle into the any organization's premises.

- 3C Parking Solution is an automatic system which delivers data processing in very high speed in systematic manner. Parking is a growing need of the time. Development of this system is very useful in this area of field. We can sell this system to any organization. By using our system they can maintain records very easily. Our system covers the every area of parking management. In coming future there will be excessive need of Vehicle parking management system.

# DEFINITION OF PROBLEM

- Now a days in parking like valet parking they maintain just with the tokens and they have records the vehicle details in books so that during some critical situations like police enquiry of terrorist car or vehicle robbery that case it is difficult to find the details of particular vehicle but in this case is easy to find in 1 to 2 seconds
- By parking the vehicle in public place the vehicle can be claimed by towing person but in this case there is no towing problems and no need to give fine for anything we can park our vehicle with securely.

# SYSTEM REQUIREMENT

- **Technology Used :-**

1. **Python :** Python is a popular, interpreted, high-level programming language which is widely used. Python is a general-purpose programming language hence, python-based projects are used for developing both desktop and web applications.
2. **Spyder :** Spyder is an Integrated Development Environment. This means it combines many features associated with programming tasks, including: the editing of text files, the execution of code in a shell1, the preview of figures created by your code, and much more. Therefore, IDEs are very useful for programming
3. **Tkinter :** This framework provides Python users with a simple way to create GUI elements using the widgets found in the Tk toolkit. Tk widgets can be **used** to construct buttons, menus, data fields, etc. in a Python application.
4. **OpenCV :** It is a cross-platform library using which we can develop real-time computer vision applications. It mainly focuses on image processing, video capture and analysis including features like face detection and object detection.
5. **SqLite : It** allows a single database connection to access multiple database files simultaneously. This brings many nice features like joining tables in different databases or copying data between databases in a single command. SQLite is capable of creating in-memory databases that are very fast to work with.
6. **Twilio API :** Twilio's APIs (Application Programming Interfaces) power its platform for communications. Behind these APIs is a software layer connecting and optimizing communications networks around the world to allow your users to call and message anyone, globally. Twilio has a whole host of **APIs**, from **SMS** to Voice to Wireless!
7. **Pyqrcode :** The pyqrcode module is a QR code generator that is simple to use and written in pure python. The module is compatible with Python 2.6, 2.7, and 3.x. The module automates most of the building process for you. Generally, QR codes can be created using only two lines of code!

- **HARDWARE & SOFTWARE REQUIREMENT :-**

| | |
|---|---|
| PROCESSOR TYPE | Pentium IV or above for optimum performance. |
| SYSTEM RAM | 1.00GB and Above |
| INPUT DEVICE | Basic Keyboard , Touch Pad & Web Cam |
| OUTPUT DEVICE | Standard Color Monitor |
| OPERATING SYSTEM | WINDOWS 7,8 or above |
| FRONT END | Python(Tkinter) , Internet Connectivity |
| BACK END | Python (Spyder),SqLite , Internet Connectivity |

# This Project contains two phases

## 1. Admin Control (Backend) :

This is a GUI Desktop application, In which the admin will take the Necessary input Details from the user, and fill this information in the dialogue box, and app will automatically validate it and will send two Specific QR codes to the user to their respective E-mail id provided by the user.

## 2. User End Scanner ( Frontend ) :

This Desktop application will Use a webcam to scan the QR code, Validate the user and perform actions like allotting a slot, notify user etc and the action of this phase admin will see on their desktop window and user will be notified via speakers(text to speech).

# The Admin Control
# of
# 3C Parking Solution
# (1st Phase)

- First window after starting the app will be like this. The is the login window of **"3C parking solution of J.C. Bose University of Science and Technology".** Here admin will put their email and password.


**Image 1.1**

- If the admin fills any wrong inrformation or internet connectivity lost then the app will show message like this in a new dialog box **"Authorisation failed".**



**Image 1.2**

- If admin puts right credentials then the authorisation successful message will be shown on screen and the main dialog box will open for the admin.


**Image 1.3**

- The main dialog box of 3C parking Solution will be shown like this :
- Now, admin can register to the subsequent user by filling their necessary details.
- Here is a check box for employees in the top of the dialogue box which differs the unique id of student from the employees.


**Image 1.4**

- Here we use many checkpoints for the convenience of the user such as: -

    a. After pressing on submit, firstly app will check the internet connectivity and then after other things.
    b. No special character can be used in unique id
    c. No space in name and surname
    d. No space in driving license
    e. If admin will put phone number starting with +91 then it must have 13 characters, or if without +91 then it must have 10 characters

- After press on submit, if there are any such problems, then a dialog box will open and will show registration failed and will show all errors in the input data such as shown in **image 1.5**

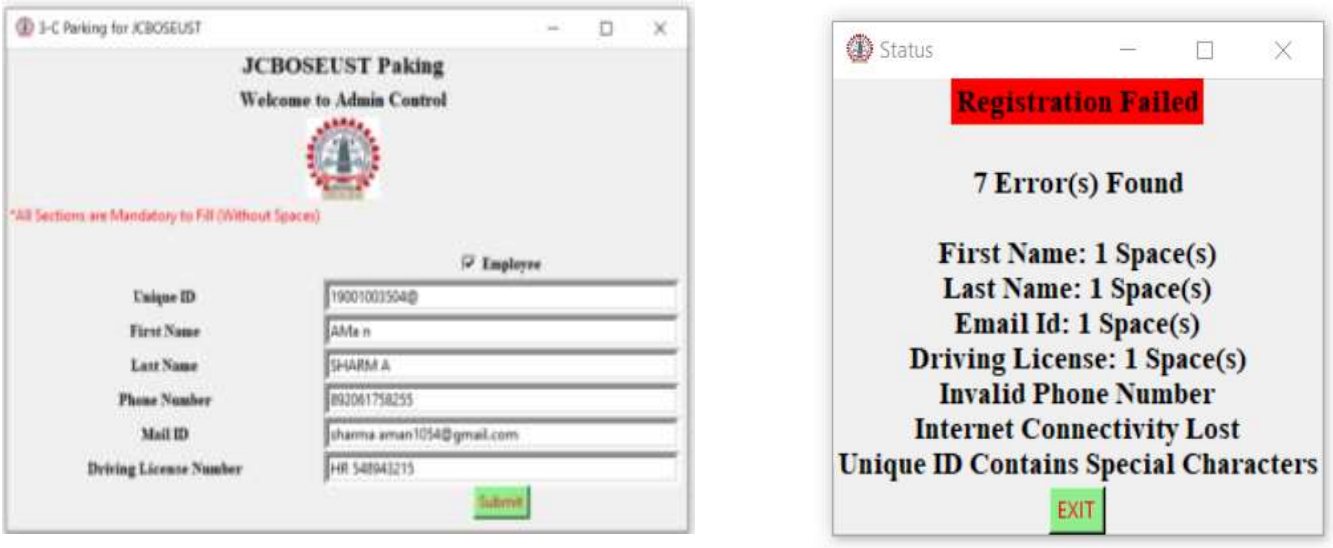



**Image 1.5**

- If all the Information filled by the admin is correct then after pressing on **submit** button a dialog box will be opened which shows the "**Registration Successful**" and two QR code will be sent to the user according to their information on their given Email Id.
- After Registration successful admin will have to click on exit so the fresh dialogue box is open for filling the information of new user


**Image 1.6**

- The mail sent by the admin id or received by the user will be shown like this on their respective email ids.
- The admin will have this mail in their sent section and user will have this in their inbox section.
- The purpose of using email for this proccess is to create a database at admin side for accessing that data for any use in future.
- Here you can see the unique id of the user has **' E '** in starting which shows he/she is an employee. This is because of the checkbox which is present at the top of admin control dialog box in **Image 1.6** . If we don't tick on that check box the unique id wil shown as **( S19001003504)** here **' S '** shows the user is a student .


**Image : 1.7**

- Fresh dialogue box is shown in **Image 1.8** :
- Here admin will fill as much user information as much they want
- For stoping this applicatiom the admin will simply press on the Cross button on the right side top corner.


**Image 1.8**

- Here I will show that we are using encryption and decryption in QR code generated by this app. If anybody outside the university wants to read our QR code with any normal QR code Scanner. He/she will not get any information from our QR code.
- The encrypted message of QR code is shown in **Image 1.9**


**Image 1.9**

# (2nd Phase)

## This is User End Scanner of 3C Parking Solution

- This is the first window shown at admin side in desktop after starting the user end scanner.
- Here we are using two different tables for storing bike and car entry & exit data for their work with the help of SqLite.
- One more technique we are using here which is text to speech by the help of speaker at user end this will help the user to give information by speaking such as:
  1. QR scanner is free to scan QR code.
  2. Which spot user got today.
  3. There is internet available or not, so system will only tell todays spot but not sent today's information on user's email or phone number
- Firstly it will ask to clear occupied spaces.
- If admin presses **'N'** :
- Then it will start with the previous data of car and bike and ask to select camera from available options


**Image 2.1**

- If admin wants to clear all the spots which are occupied previously and wants to use application in a new fresh manner then he/she will Press 'Y' ,
- After that app will ask for confirmation and then after confirming admin can choose number of spots of car and bike seprately he wants in their app ( take 3 as an example ).
- After filling the spots app will ask admin to select camera from the available options.

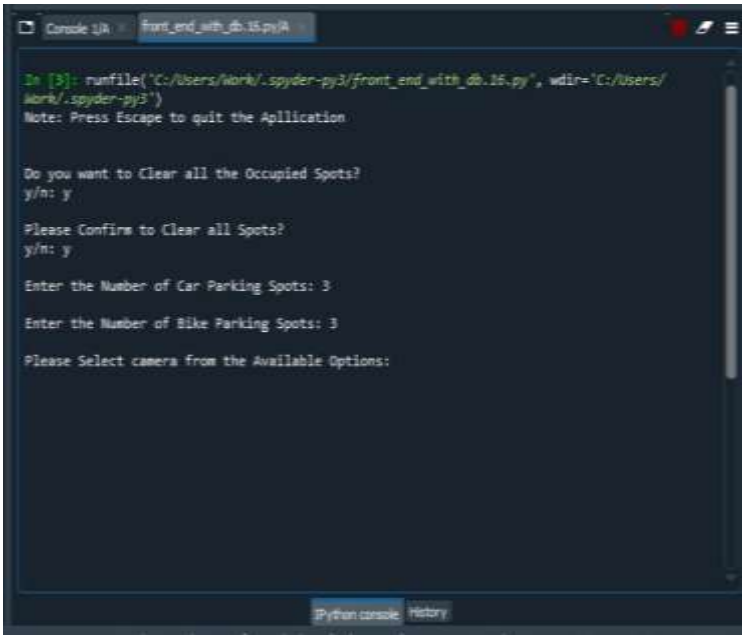



**Image 2.2**

- The app will show one by one all the availabe cameras connected with the system like shown in the image.


**Image 2.3**

- If admin will press escape then app will show another camera option if available in the system like in this image


**Image 2.4**

- After checking all the camera options if admin will press escape again then such dialog box will open which tell you that operational camera is found but not selected by user
- Do you want to try again?
- If admin will press 'n' then he/she will exit from the app.
- If he/she will press 'y' then again app will show all the available options of camera in the system.

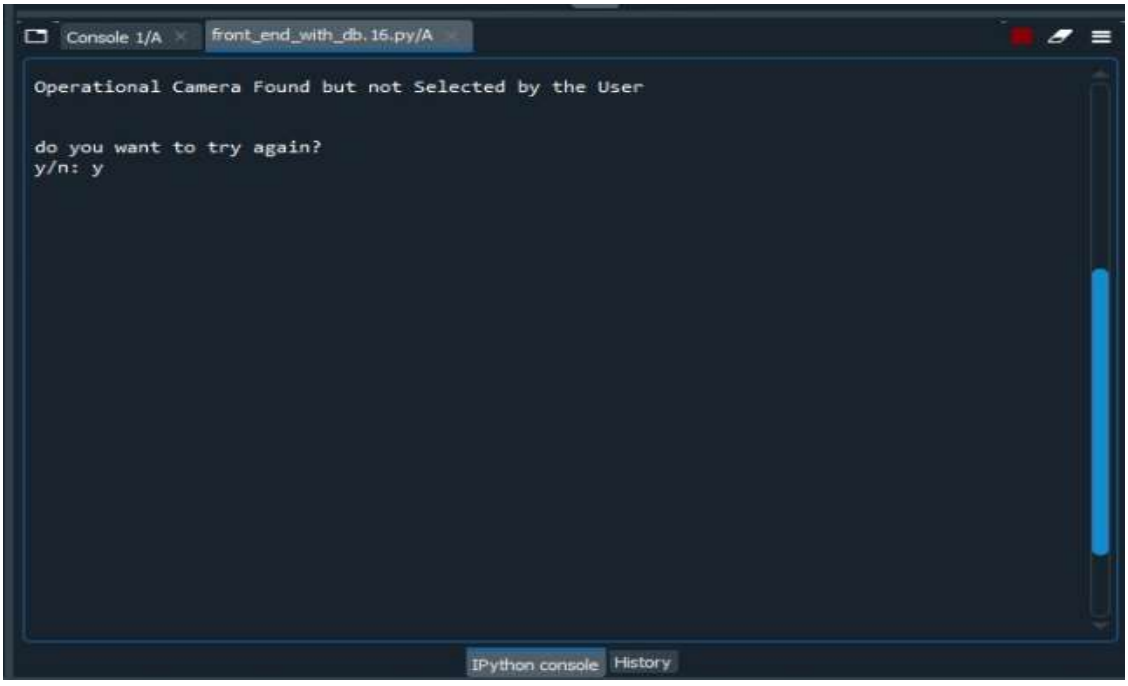



**Image 2.5**

- Here app will show available camera options  again.
- If admin want to select that camera then he/she will have to press ’y’ as shown in the image 2.6 .


**Image 2.6**

- Then Qr Scanner is ready to start scanning QR code for the user.

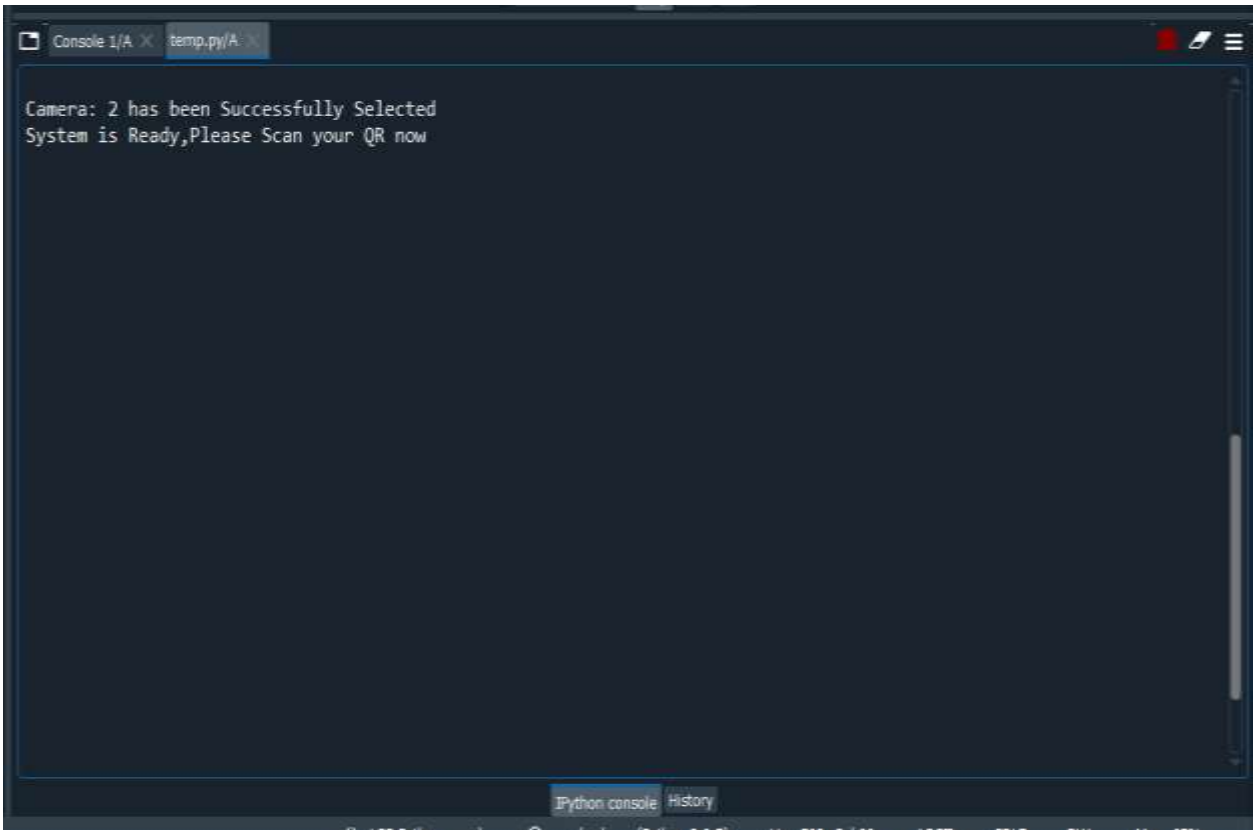



**Image 2.7**

- The starting window at user end will show like this after starting of QR scanner.

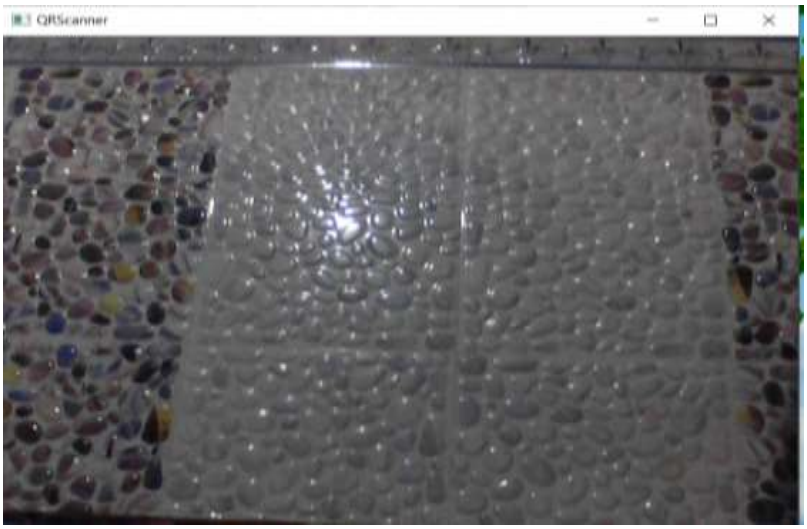



**Image 2.8**

- Here we show if any unauthorized user scans their code then app will automatically detect that he/she is an unauthorized user.
- App will speak through speakers that this QR code is unauthorized.

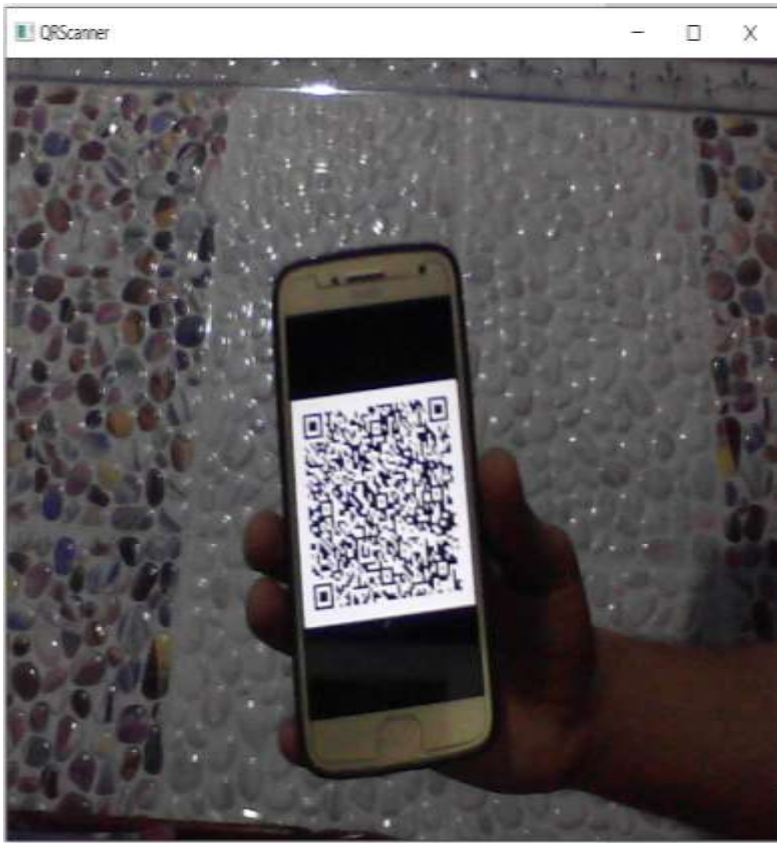



**Image 2.9**

- At the admin side app will show all the messages in text format.

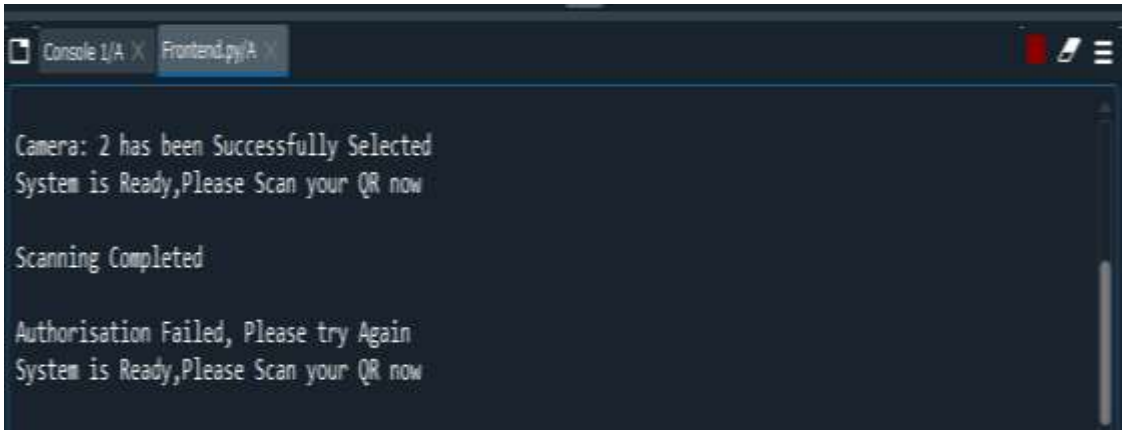



**Image 2.10**

❖ **<u>Now here we will take one case :</u>**

- If Aman Sharma(user 1) scans his code for his car then app will alot a nearest space to him which is spot 1 by speaking like :
  1. Scanning completed.
  2. Welcome Aman Sharma your car spot is 1.
- And an Email and message on their phone will be sent by the app which will have date, time and today's spot and then speak :-
  3. Please wait for next scanning
  4. System is ready, please scan your Qr now.

← **Image 2.11**

**Image 2.12** →

- After that Gaganpreet Singh (User 2) scans his code for car then he will get spot 2 which is the nearest spot and all the other actions will repeat again as same as the above user 1.

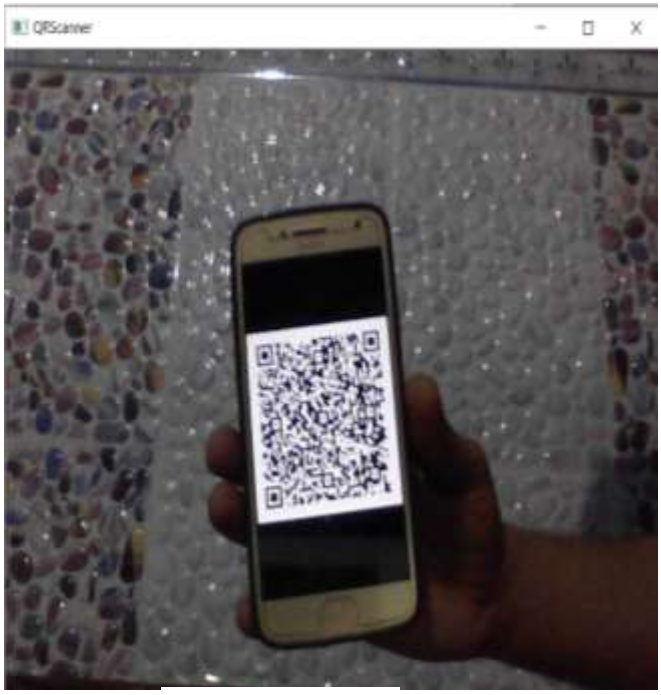



**Image : 2.13**


**Image : 2.14**

- After that Akash Nagra(User 3) scans his code for car then he will get spot 3 which is the nearest spot and all the other actions will repeat again as same as the above user 1.

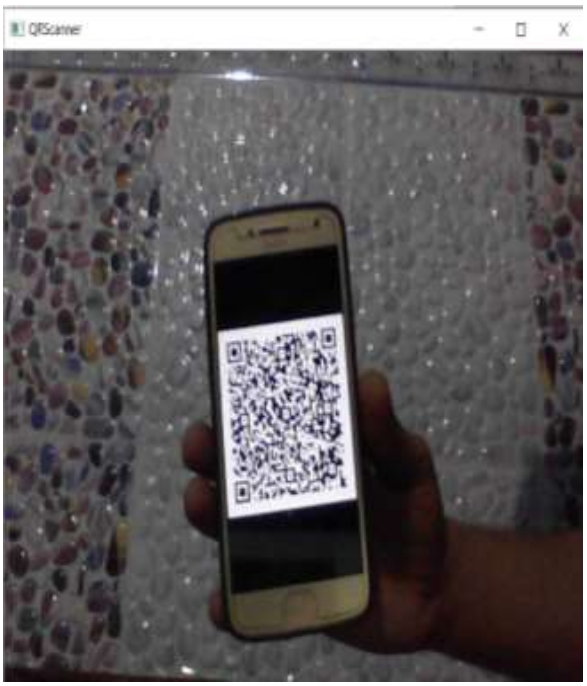



**Image : 2.13**


**Image : 2.15**

- After that Nitish Chaurasiya (User 4) scans his code for car then he will not get any spot and app will tell him, by speaking, that parking is full.
- This is because the admin has allotted only 3 spaces for car in the starting of app.

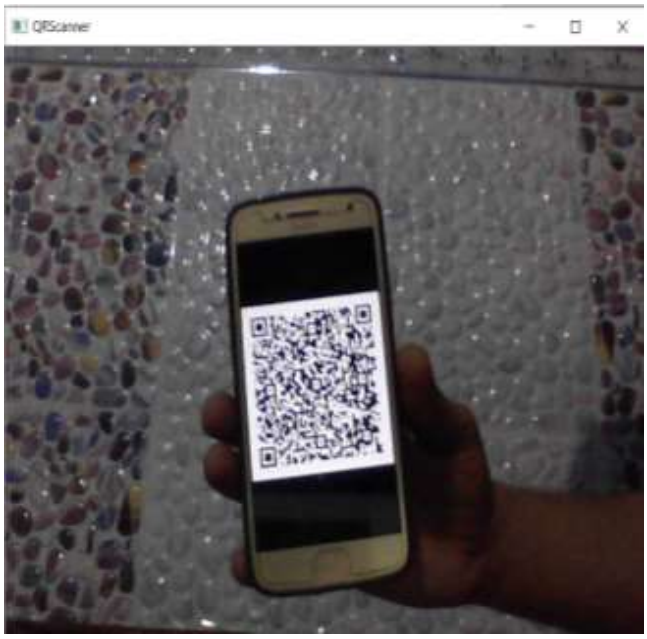



**Image : 2.17**


**Image : 2.18**

- After that Aman Sharma (user 1) who has occpied spot 1. Now wants to exit and scan their code again on qr code scanner the app will speak:
  1. Thank you Aman Sharma for using Parking.
  2. Please wait for next scanning.
  3. System is reay please scan your Qr code now.
- In this action Aman Shram ( user 1) releases his spot 1

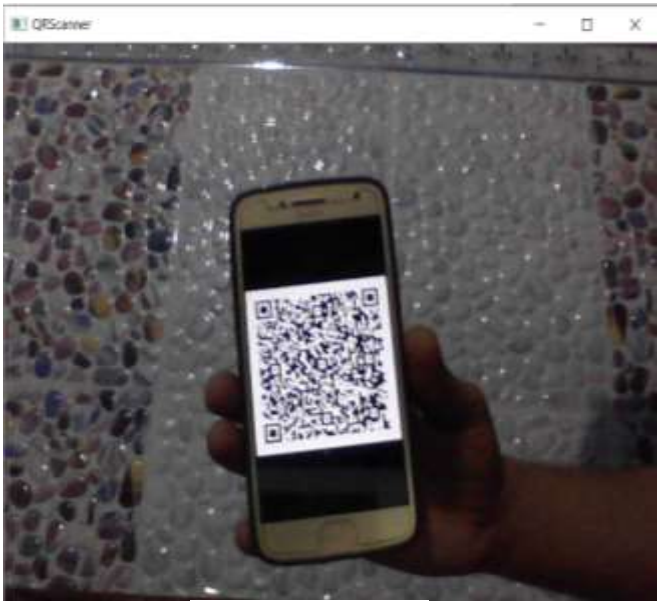



**Image : 2.19**


**Image : 2.20**

- After that Nitish Chaurasiya( User 4)comes again and scans his code for car then he will get spot 1 because which is the nearest spot
- If there are 2 vacant spot at that time then also app will give u spot 1 because it is the nearest spot.
- If Nitish scans his code and internet connectivity is lost simultaneously The app will speak :
  1. Internet connectivity lost, automated E-mail and text messages would not be sent.
  2. Your car spot is 1.
- **All the operation performed by this app is also similar with the bike .**


**Image : 2.21**


**Image : 2.22**

- In between all this process if admin wants to interrupt it.Then He/she will simply press "**Escape Button**" so the app will show message like:
  1. 1.Scanning interrupted by user.
  2. 2.Do you want to exit the application.
- So admin will easily exit the application by pressing **'Y'** and enter.
- And the last message show by the app at that time

  **"Thank you for using J C Bose University Parking , Have a good day".**

- If he/she doesn't want to exit and continue running the application then simply press **'N'** and enter.

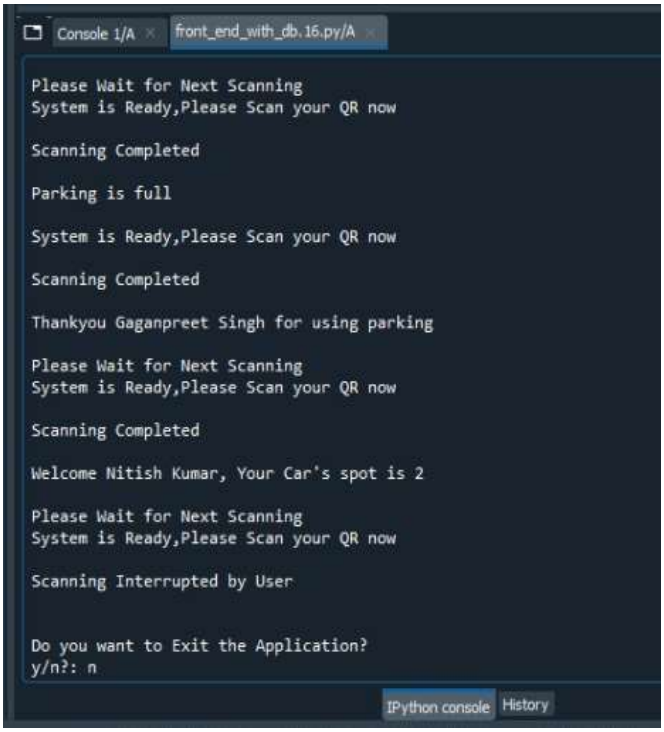



**Image : 2.23**


**Image : 2.24**

- Here are all the emails sent by the admin and received by the user of entry and exit will be shown like this On their respective email ids.
- The admin will have this mail in their sent section and user will have this in their inbox section.
- The purpose of using email for this proccess is to create a database at admin's side for accessing that data for any use in future.

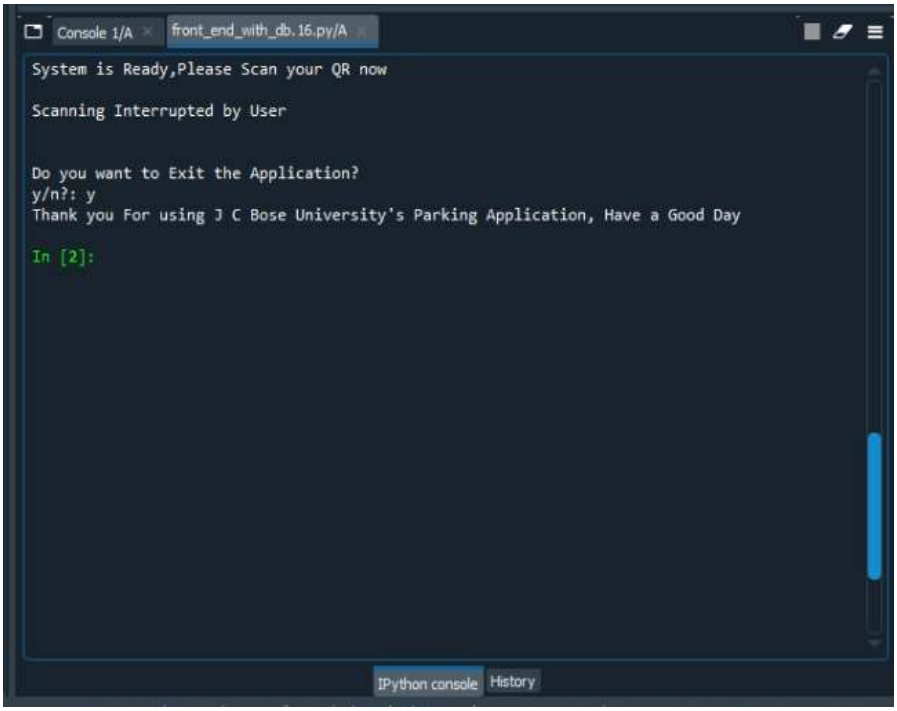



**Image : 2.25**

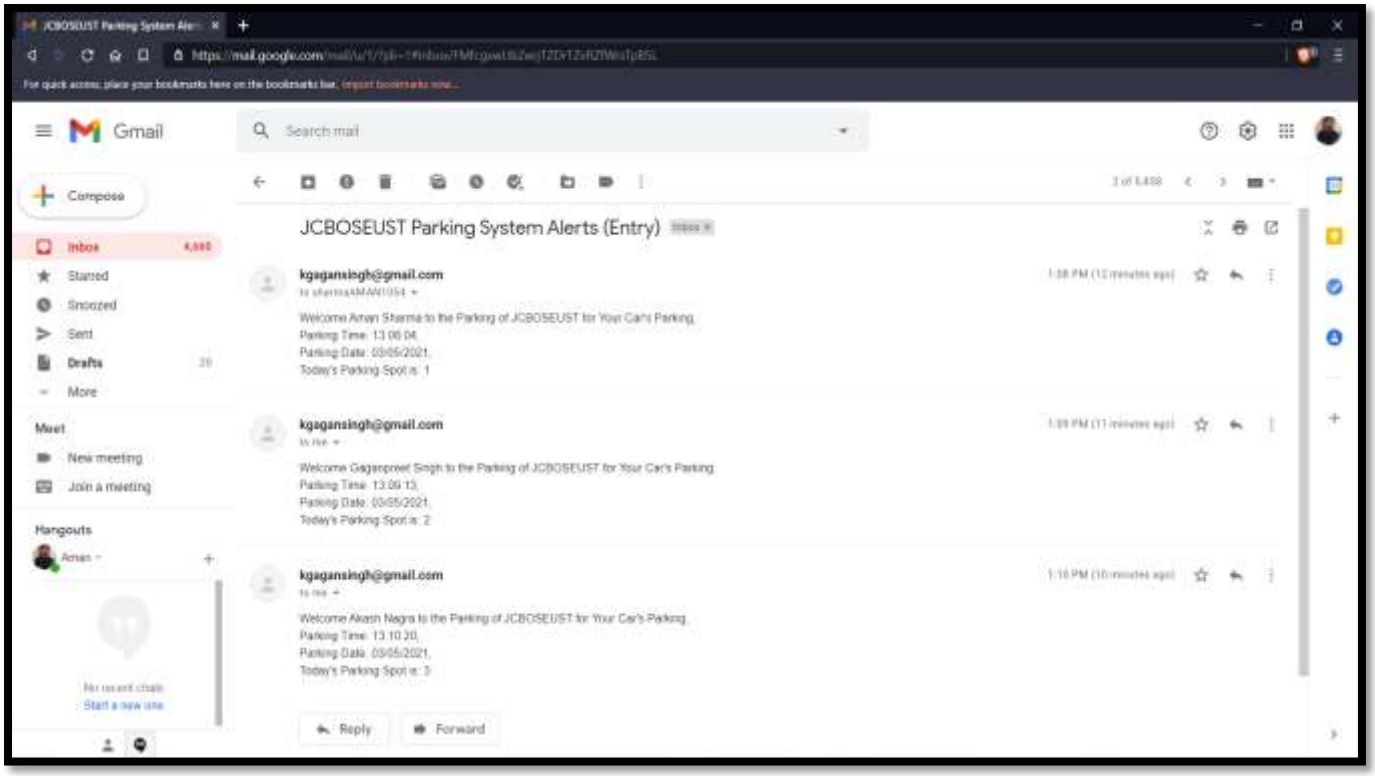



**Image 2.26**

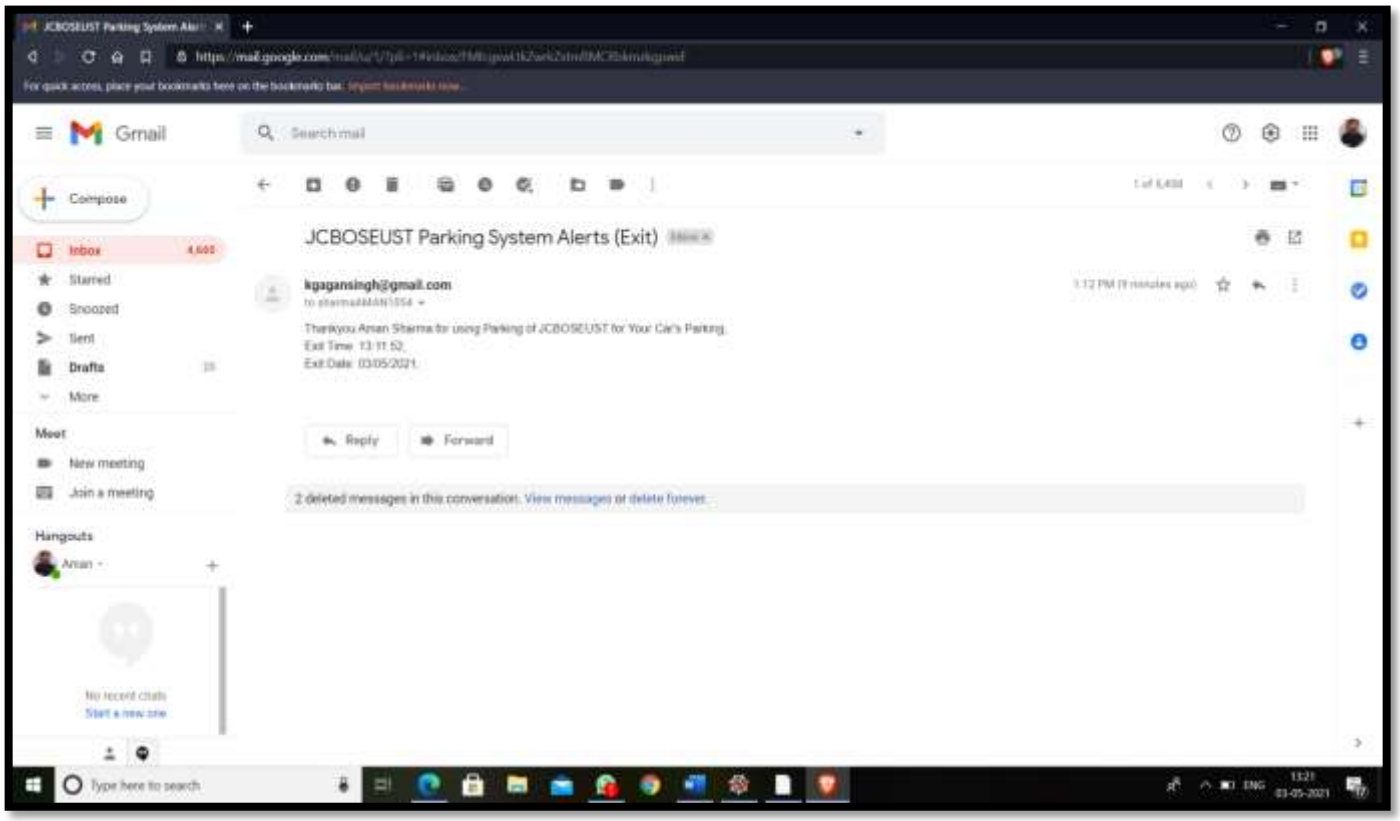



**Image : 2.26 (1)**

- Here are all the messages received by the user of entry and exit will be shown like this On their respective phone numbers

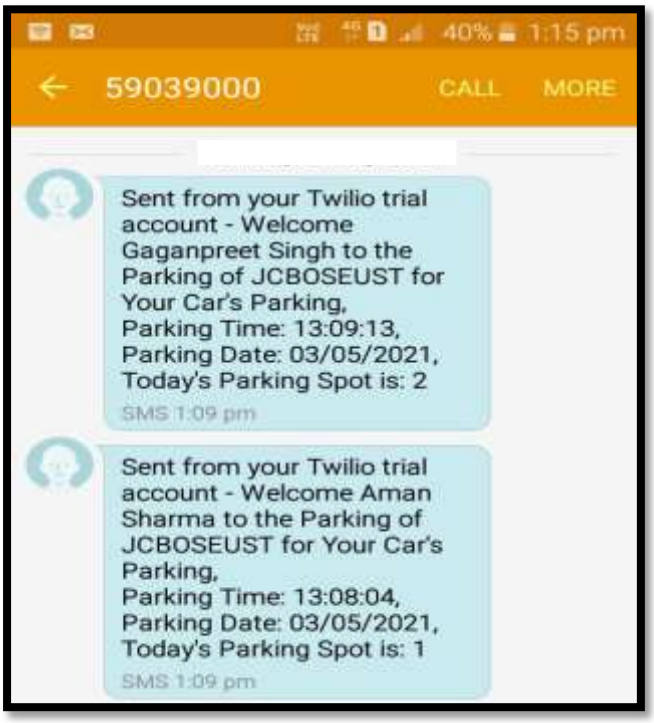



**Image : 2.27**

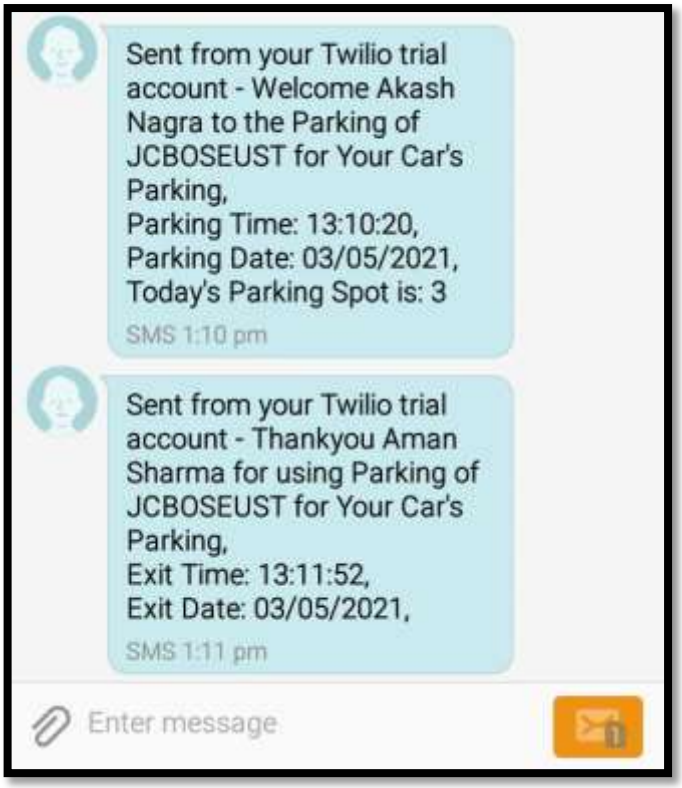



**Image : 2.28**