

RFID PARKING SYSTEM USING RANGE CIRCULAR QUERY

A Report for the evaluation 3 of project 2

Submitted by

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TABLE OF CONTENT

CHAPTER NO.	TITLE	PAGE NO.
1.	Abstract	1
2.	Introduction	2
3.	Existing system	5
4.	Proposed system	7
5.	Implementation or architecture diagram	10
6.	Output/Result/Screenshot	15
7.	Conclusion/Future enhancement	17
8	References	20

ABSTRACT

The spontaneous growth of wireless communication networks and mobile devices has motivated an intense research in mobile data applications. This project provides an advanced ticketing system for the parking spots make it easy to tag a vehicle by using RFID tracker to identify the user and amount will be deducted directly from his wallet. This system makes the work easier for both the ends to keep a track as well as pay the amount in a very efficient way.

Location representation may include timestamp information as it may be related to a moving object/person, and may be represented in various ways. The user can go cashless and can also see the record of their previous parking. The user can keep the records of its previous activities. It is not too costly. This project helps to reduce the manual work, it also saves time, this type of modern parking helps the reduction in parking area/place as we can go through floor and underground system parking. The entry and exit of vehicle is monitored under a system, and a card can be used for the deduction of money. By using circular query processing, we will also set a limit by which people can find nearby parking slot as per their convenience. This project will help us to go through advanced automation system and uplift the modern world.

INTRODUCTION

- The goal of this project is to create a RFID based automated parking system. This help to get rid from the current scenario of messed up parking system. In this modern era, when everything is going to be automated, then we are also creating a modern parking system. Through this, we can able to reduce the cost and management of current operations of manual parking system like entry and exit of vehicle, vacant parking slot, calculation of timing of parking, price, bill payment and many more. We are using RFID in this project.

RFID

RFID (Radio-frequency identification) is an automatic identification method wherein the data stored on RFID tags or transponders is remotely retrieved. The RFID tag is a device that can be attached to or incorporated into a product, animal or person for identification and tracking using radio waves. Some tags can be read from several metres away, beyond the line of sight of the reader. These system ease parking systems of malls and buildings and many more places where such a big space of parking needed. A RFID is made up from an antenna/coil, a transponder and a transceiver. RFID is of many types and they are divided on different categories on the basis of their frequency ranges are as follows:-

- Low- frequency RFID kits(30-500kHz)
- Mid-frequency RFID kits(900kHz-1500MHz)
- High-frequency RFID kits(2.4-2.5GHz).

RFID antenna

The antenna emits radio signals to activate the tag and read/write data from/to it. It is the conduit between the tag and the transceiver, which controls the system's data acquisition and communication. The electromagnetic field produced by the antenna can be constantly present when multiple tags are expected continually. If constant interrogation is not required, a sensor device can activate the field. Often the antenna is packaged with a transceiver and decoder to act as a reader (interrogator), which can be configured either as a handheld or a fixed-mount device. The reader emits radio waves in the range of 2.5 cm to 30 metres or more, depending upon its power output and the radio frequency used. When an RFID tag passes through the electromagnetic zone, it detects the reader's activation signal. The reader decodes the data encoded in the tag's integrated circuit (silicon chip) and communicates to the host computer for processing.

Tags(transponders)

It comprises a microchip containing identifying information about the item and an antenna that transmits this data wirelessly to the reader. At its most basic, the chip contains a serialised identifier or licence plate number that uniquely identifies that item (similar to bar codes). A key difference, however, is that RFID tags have a higher data capacity than their bar code counterparts. This increases the options for the type of information that can be encoded on the tag; it may include the manufacturer's name, batch or lot number, weight, ownership, destination

and history (such as the temperature range to which an item has been exposed). In fact, an unlimited list of other types of information can be stored on RFID tags, depending on the application's requirements.

RFID tag can be placed on individual items, cases or pallets for identification purposes, as well as fixed assets such as trailers, containers and totes. There are different types of tags with varying capabilities:

1. Read-only tag
2. Write-once tag
3. Full read –write tags

we are also using circular query processing in this. This is the system, with the help of it, when we need to track any moving object or find any place within the limited range. Let's take an example, we need to find parking spots within 5 km. Then we will get to know about by the using of this theory. This idea is mainly based or focused upon location based service(LBS). There are some characteristics of this query, are as follows:-

1. This can help us to locate the objects in moving state also.
2. This theory involves a location parameter , which is changing continuously with the movement of object.
3. This system gives updated information and maintain its updates with time to time.
4. This is also based on client-server relationship.

EXISTING SYSTEM

The existing offline system which consist a lot of manual work which takes a lot of time and physical effort. There need a lot of employees with the needs of the skills, Users need to stand in a queue if they want to know the details of parking charges, details, time slots. It takes a lot of time and effort to collect information about vehicles. Proper information is not available to the users. Many times in festive season consumer forget their parking slots and cannot be known whether the slot is available or not. They not need to carry cash as they can go cashless with the upcoming system. In the existing system, there are manual works which takes lots of time, many people required for this system. They have to make a charted plan in a systematic way. There are many employees need for this, sometimes it is very difficult to find parking spots, people will also confused about their location, if user need any information, they have to stand in the queue, for also the payment sometimes many issues will generate, so it is very messed up system which requires lots of time and also if issued token will be lost, it creates a lot of problems for the user and admin. In this system the consumer cannot see its all transaction and history. There are also issues in fare, timing slots etc.

Drawbacks of the Existing System

- #- In existing system, lots of employees will be required for manual work.
- #- It requires lots of time and very messed up system.
- #- consumer need to be ready with cash.
- #- In time during festive season, there will be a lot of problems for the parking space.
- #- There is advanced booking and live tracking system

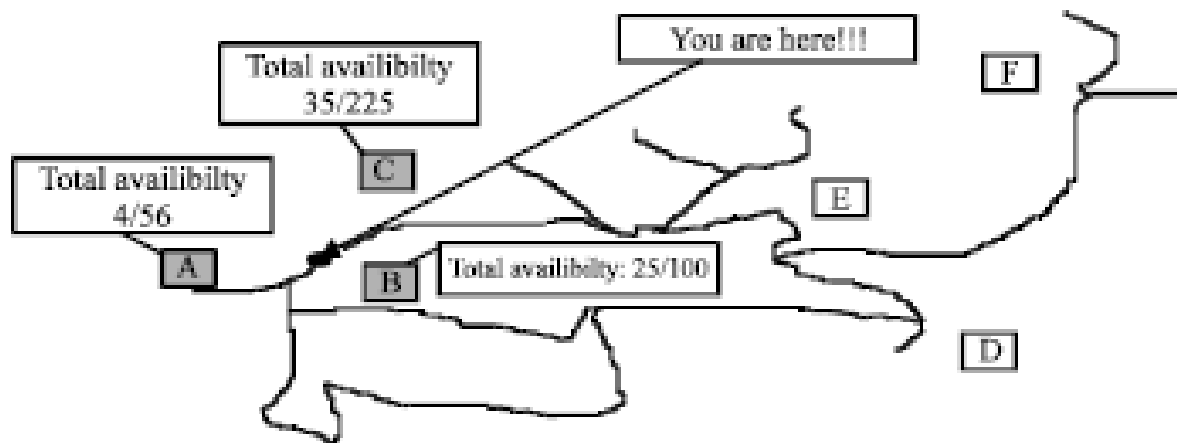
CIRCULAR QUERY PROCESSING

The idea of querying moving objects emerged in the early 1990s when the deployment of large mobile cellular networks started. Queries such as “find Alice’s nearest petrol stations while she is driving” or “find all the taxi cabs within 1 Km distance from Alice” were envisioned. Ten years later, advanced mobile devices such as personal digital assistants had become popular, and CSQs started to attract more attention in the spatial database community.

- with the help of this , costumers get to know about the nearby parking slots.
- costumers get to know about the nearby parking place within given range.
- The server computes the safe region using guard objects and results and returns back to the client.
- Advance booking can also be done within this.

PROPOSED SYSTEM

You have a one parking lot reserved at A. Your reservation will be expired within 30 min



In the proposed system, the information about vehicle can be found in an easy and simple way which does not take any time or effort. This system provides an easy way to find parking spot or vacant space within less time. Users can search details of the parking time, money charged and can pay through his wallet and keep records with them. This system enables users to communicate with admin directly which avoids miscommunication. The system calculates the entry and exit time of a vehicle and by this it calculates the fare and it will be directly pay through the consumer wallet by the RFID app.

MODULES

A. Sensor level module:

It can be done by the use of CMOS, ultrasonic and Electro-magnetic sensor for the concept of detecting the presence of the car in the parking slot. And by the help of modem and arduino, we can transmit the signal wirelessly to the receiver.

B. Billing/Payment module:

In the car parking system we will collect information about the driver and store it in our database and using an application we will be able to provide options for online payment after which they can park their car and during the exit time billing will be done and any additional charges are added on to their account.

C. Program level module:

In programming level we will process the received signal with mega arduino to find the free parking slots and obtain results. Then it's transmitted to the server with the help of the modem.

D. Display level module:

In display level there are two ways of taking care of. At first, the parking area once booked changes its LED color which indicates that parking slot is taken. After this, the user's mobile application and the server works at the client level and admin level. It will be very helpful for the user to understand the whole process.

USER APP

The user needs to register with the application by entering all the details. The user can get login by enter valid username and password. They can search information of the parking and can add money, check history and current parking plots, user can also change password if they feel uncomfortable.

- **Login:** The user has to login using his RFID id and password and he is remembered the system until he logs out.
- **Add Money:** The user is allowed to add money into his wallet using his Debit or Credit Card.

- **History:** The user is allowed to see his previous Parking history.
- **Current Parking:** This module shows the user if he has parked his vehicle in any parking plots and shows the time and amount that he will have to pay.
- **Change Password:** The user is allowed to change his password.
- **Booking:** Advance booking can also be done.

RFID/ ADMIN app

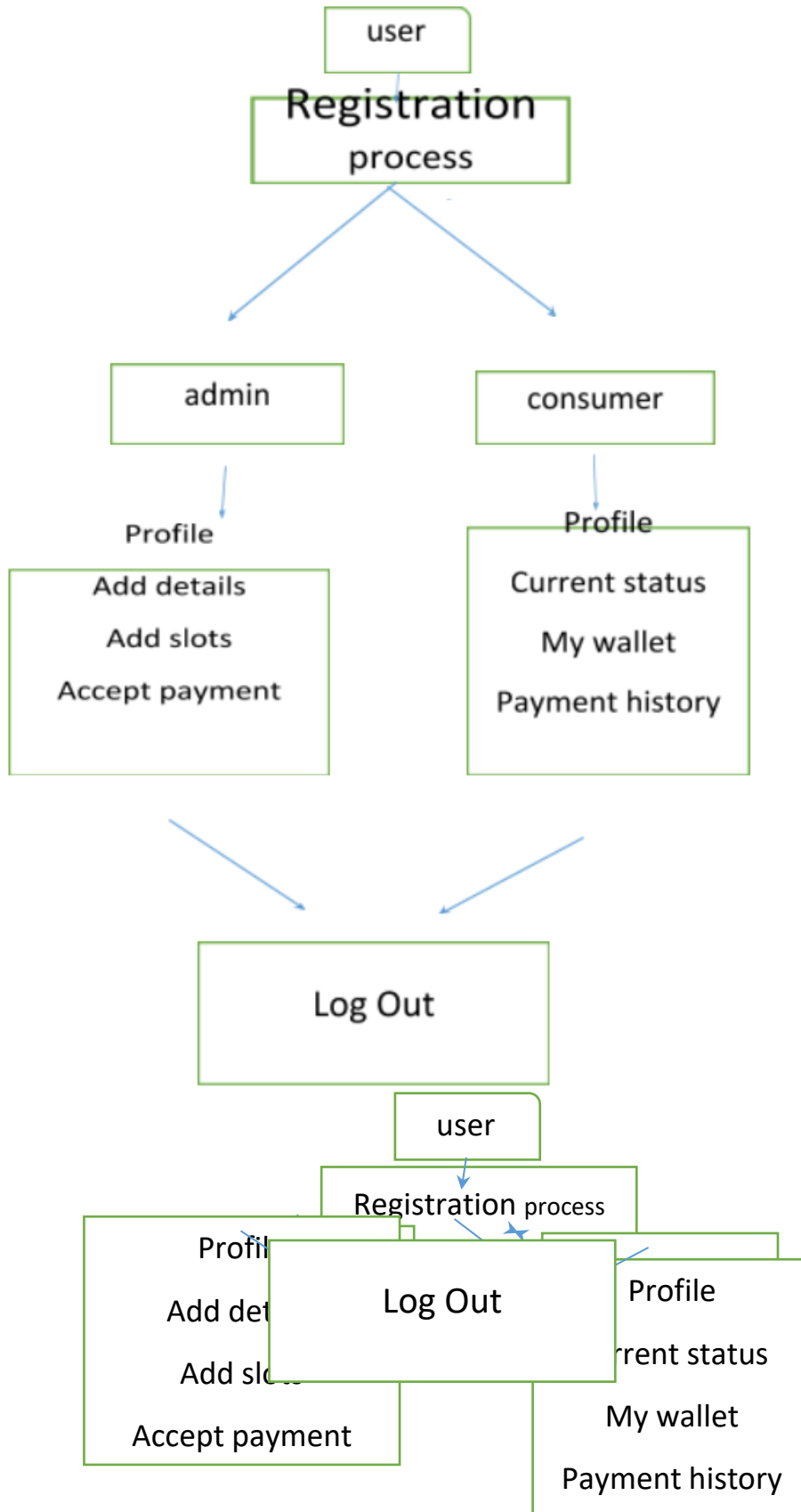
The admin needs to register first with the app by entering all the details. Admin can get login by enter valid username and password. They can add parking slots, scan the RFID card at entry and exit time , and view the transaction of every vehicle.

- **Login:** The Admin has to login into the system keep the internal data secure.
- **Add Parking Slots:** The Admin is responsible to add parking slots.

- **Scan:** The App is mostly on this model listening to the RFID cards and on both entry and exit the data is sent to the parking app and it does it works.
- **Transactions:** The Admin can view all the vehicles which were parked and the ones which are still parke

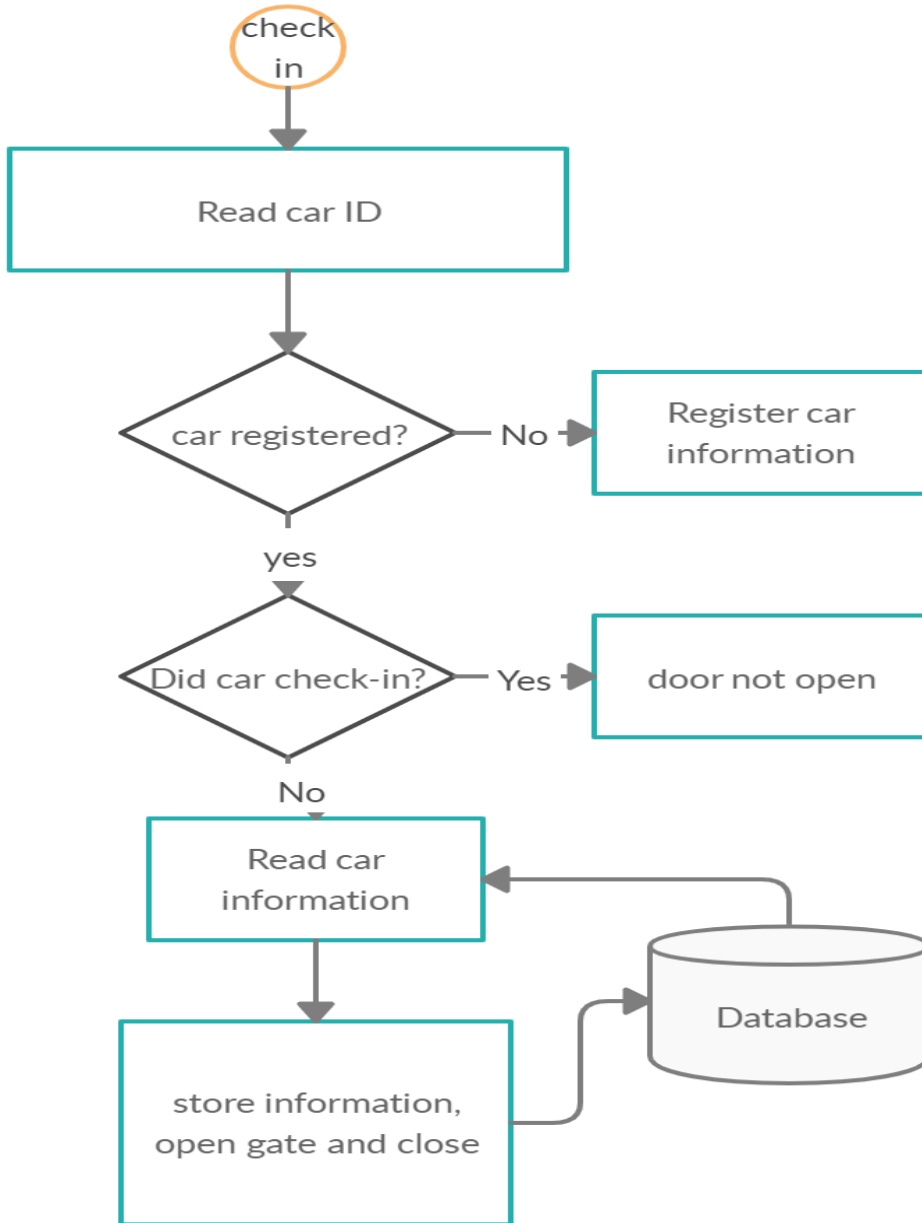
IMPLEMENTATION AND ARCHITECTURE DIAGRAM

BLOCK DIAGRAM

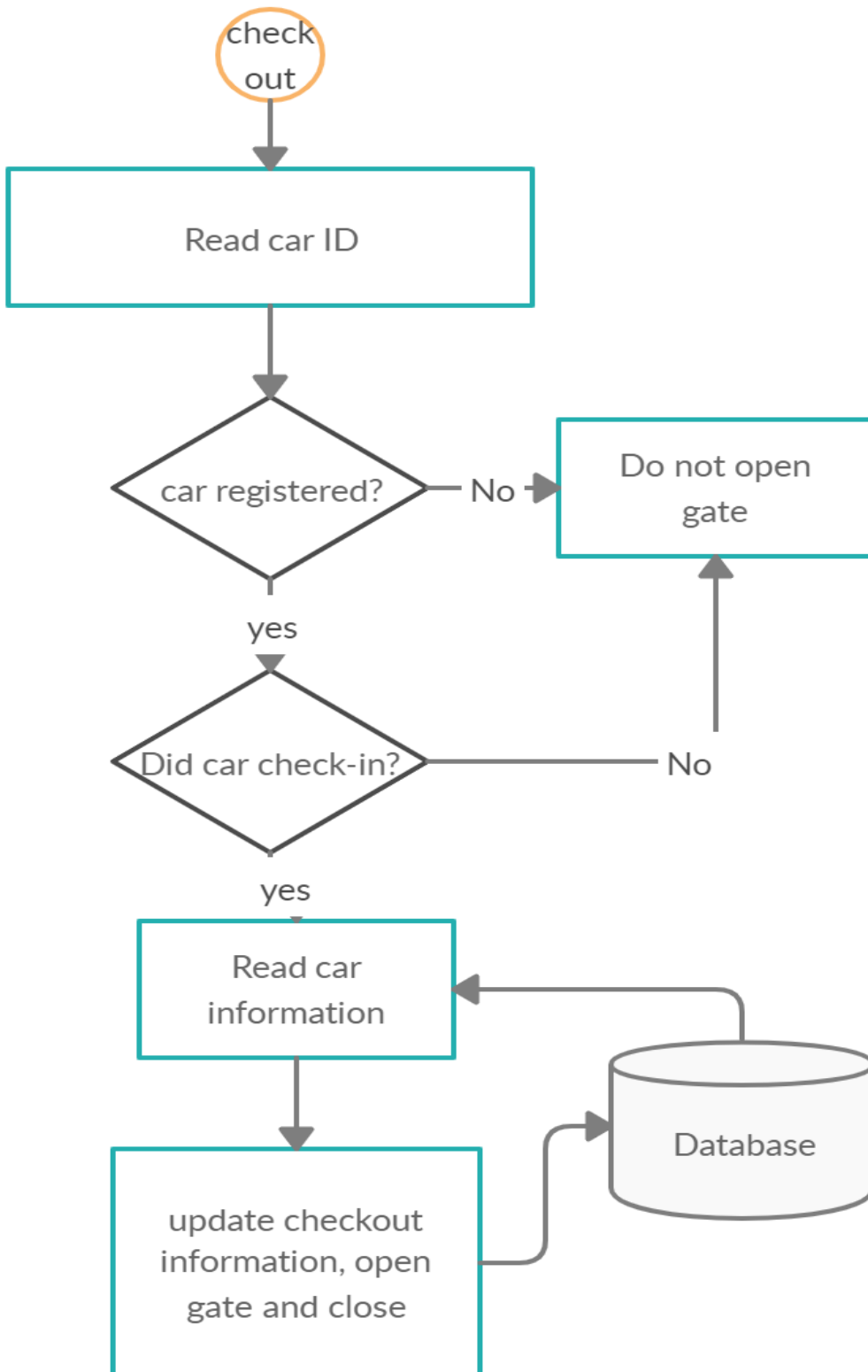


FLOW CHART:-

CHECK-IN POINT



check out point



SOURCE CODE

```
import serial
import MySQLdb
import time
db = MySQLdb.connect(host='localhost'
, user='root',passwd='',db='details')
ser = serial.Serial ( port = 'COM10', baudrate = '9600')
while True:
out = ser.read(12)
print out
rf_id = out
cur = db.cursor()
s = cur.execute("select * from transactiondetails where
rfid = %s and status = %s",(rf_id,0))
Count = cur. rowcount
print count    if count == 1:
Row = cur. fetch one ()
in_time = row[1]
out_time = time.time()
cal_time = (out_time-in_time)
c= (cal_time/60)
if c > 10 :
cal_amount = int((c/10) * 10)
else :
cal_amount = 10
cur.execute("update transactiondetails set outtime = %s,
amount = %s, totaltime = %s where
rfid= %s",(out_time,cal_amount,c,out))
```



```
db.commit()
print in_time
print out_time
print c
else :
cur.execute("insert into
transactiondetails(rfid,intime,amount,status,place,totaltime)
values(%s,%s,%s,%s,%s,%s)",
(rfid,time.time(),0,0,'Greater'Noida',0))
db.commit()
```

Technical specifications

Operating specifications for computing device are as follows:

- Processor: 1GHz
- Memory: 1GB RAM

Performance specifications for microprocessor ATmega328 are as follows:

- Operating Voltage: 5V
- Input Voltage (Recommended): 7-12V
- Input Voltage (Limit): 6-20V
- Flash Memory: 32 KB
- Memory: SRAM of 2KB and EEPROM of 1KB

Operating specifications for RFID are as follows:

- Operating Temp: -20°C to 60°C, Storage Temp: -40°C to 85°C

- Humidity: 98% Non-condensing Dust & Water IP68, works in outdoor environment

- Frequency:125KHz

- Range :10 c

OUTPUT/SCREENSHOT/RESULT

Parking System



Username _____

Password _____

SECURE LOGIN

[Forgot..? Click here..!!](#)

Parking System



Smart Parking System
via Wallet Payments

Profile

Current Status

My Wallet

Payment History

About Us

Logout

Parking System

**YOU ARE HERE
GREATER NOIDA**

Check-in Time: 12:15 p.m. 18/02/2017

Check-out Time: 02:15 p.m. 18/02/2017

Payable Amount is : Rs. 30

Pay Amount

Parking System

**Transaction Successfully
Done.....**

CONCLUSION AND FUTURE ENHANCEMENT

Currently the RFID Based Automatic Parking System is in prototype stage and works with a limited number of sensors and on a limited scale. However it is scalable and can easily accommodate more IR sensors to monitor a far greater number of parking slots. Thus its scale can be easily adjusted to the needs of the specific customer. Also it can be modified to add more features to suit specific needs or to adjust its cost-benefit ratio. Efforts are also being made to advance from the prototype stage into a more finished and polished product that will be suitable for demonstrations and promotion. All these aspects are currently being considered in detail to decide future course of the system. This project helps the consumer to save time and to get rid from the messed up parking system. By the use of online application they can locate the parking space in the circular region, and they can also pay money by their wallet.

Adaptive Project Framework

Here project scope is a variable. Additionally, the time and the cost are constants for the project. Therefore, during the project execution, the project scope is adjusted in order to get the maximum business value from the project. There is increase in productivity, saves time, accurate timing details are measured with the help of modules.

Information Technology Infrastructure Library (ITIL)

This methodology is a collection of best practices in project management. ITIL covers a broad aspect of project management which starts from the organizational management level.

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