BITS Pilani
Hyderabad Campus

AutoPARK

The next-gen car Parking

CS F213 (OBJECT ORIENTED PROGRAMMING STRUCTURES) PROJECT:

GROUP 54:

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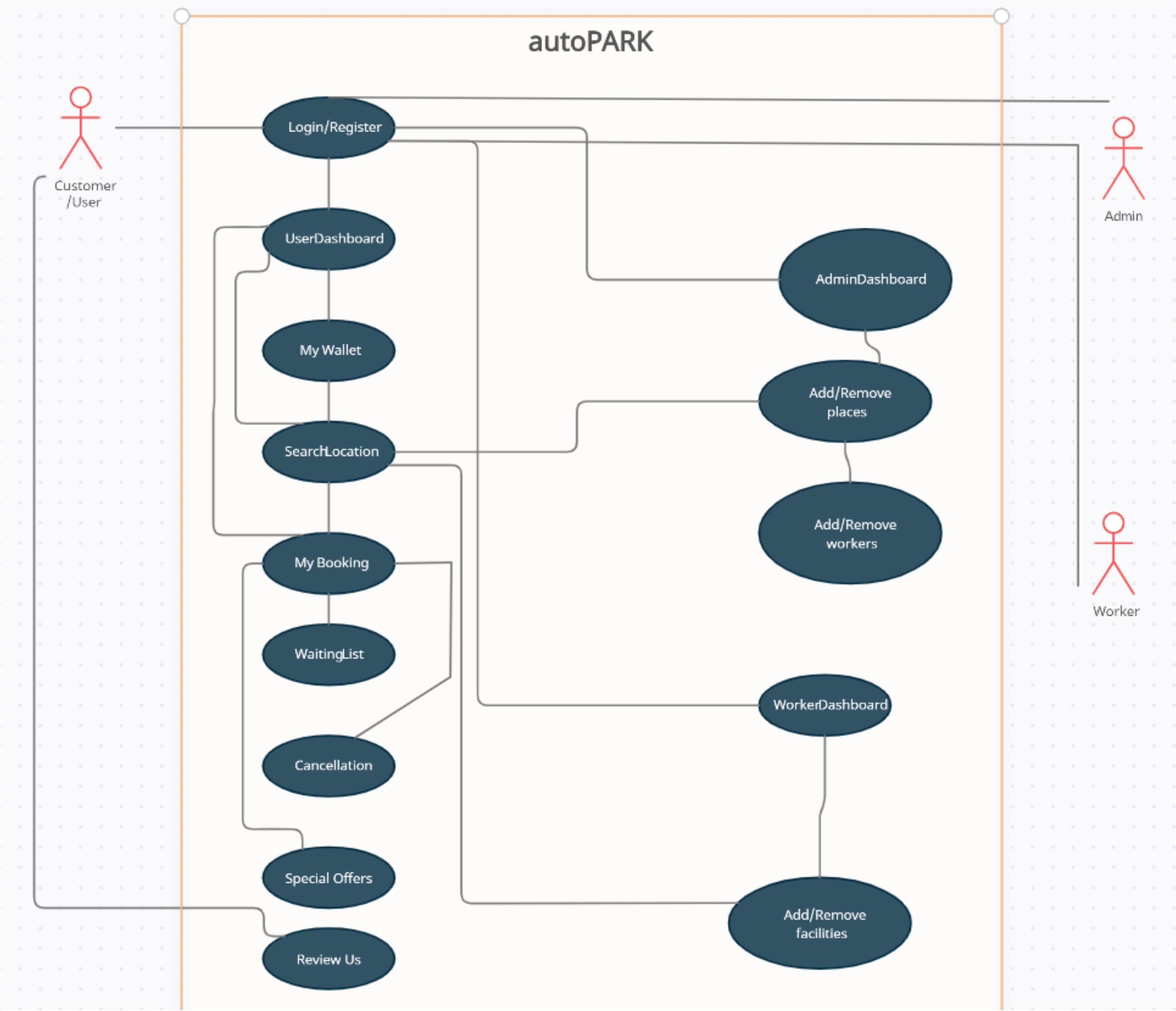
INTRODUCTION:

Throughout the times, mankind has used various means of transportation. Across the centuries, there were many diverse kinds of transportation systems. However, in the 21st century, vehicles have increased exponentially. This calls for better parking systems.

Automated vehicle parking systems are one of the significant innovations made by mankind to tackle this issue. In our project, autoPARK, we have tried to revolutionize automated car parking such that no one in this digital era has the need to struggle to find parking spots again.

Going out shopping with your family? We've got you covered. Now you no longer have to waste your precious time searching for a parking spot in the crowded basement of the mall. We at autoPARK have designed such a system that you can directly book your parking slots in advance. A hassle-free system and a user-friendly Interface are one of the strong points of autoPARK. And how about a complimentary car-wash while you're at it? We at autoPARK have also implemented a system to wash your car and service your car's engine.

Case Diagram:



User: The client/ customer towards whom the project is targeted.

Admin: The person in charge of the project. The admin has access to all the databases of the project, and can add/ remove places, users and workers.

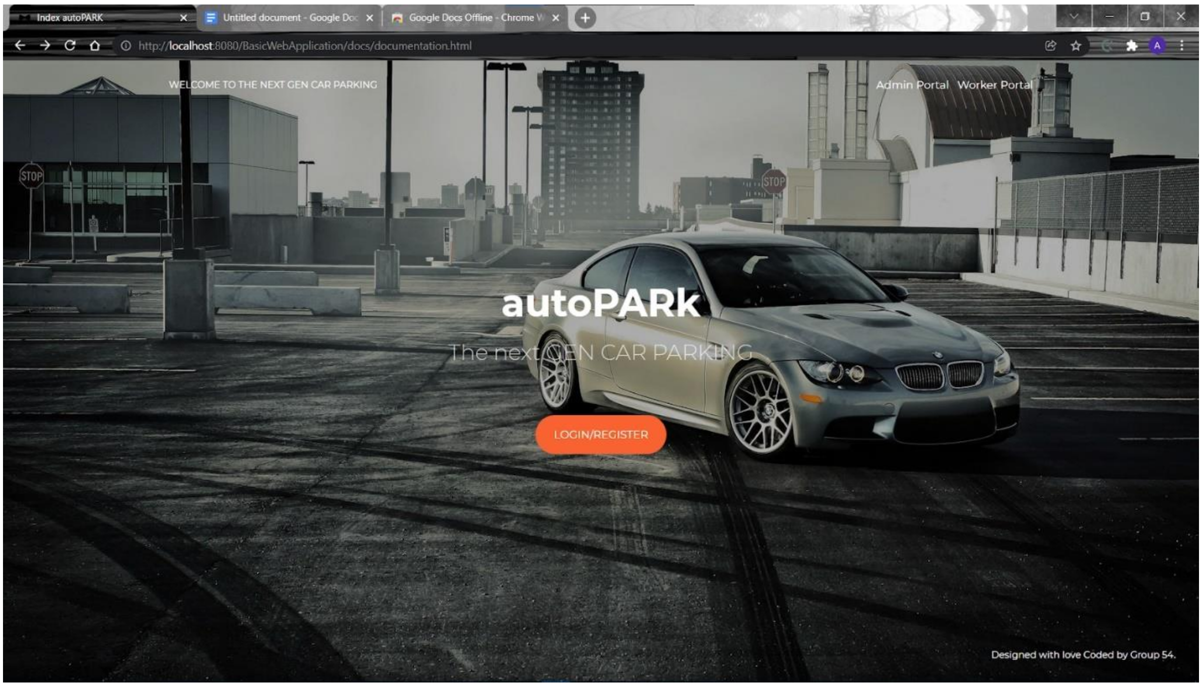
Worker: The person who helps with the facilities on site of the parking slot. The worker has access to edit how many slots are available for parking, and how many facilities like car-wash/ car- maintenance are available.

Implementation:

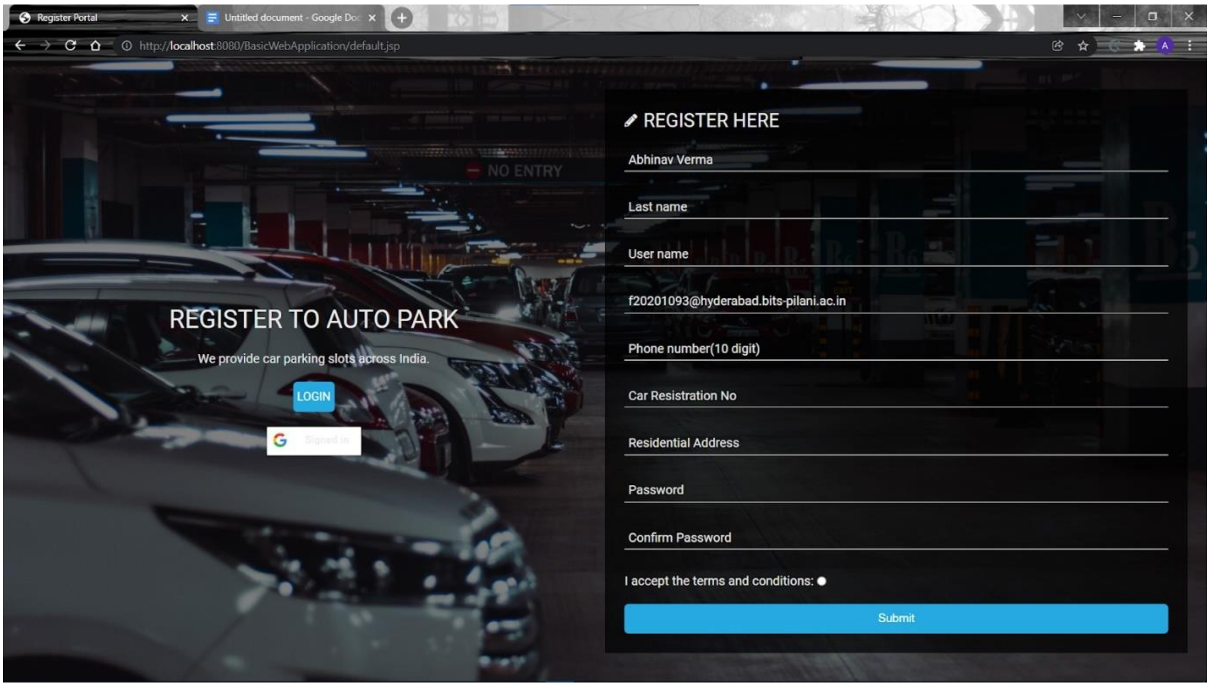
We have used html, CSS and JavaScript for the implementation of our front-end.

User Interface Implementation:

1) As a customer/user, as soon as we enter the webpage, we are directed to "index.jsp" – which is basically the introductory page to our project. It can redirect to the user login/ register, the admin login and the worker login.


Index autoPARK
Untitled document - Google Doc
Google Docs Offline - Chrome W
http://localhost:8080/BasicWebApplication/docs/documentation.html
WELCOME TO THE NEXT GEN CAR PARKING
Admin Portal
Worker Portal
STOP
STOP
autoPARk
The next GEN CAR PARKING
LOGIN/REGISTER
Designed with love Coded by Group 54.

2) a) The user then clicks on login/ register, where he is redirected to another page, "default.jsp". If the user fills in the details and clicks register, he is redirected to "RegisterOTP.jsp", where he has to fill in the OTP sent to his mobile number [1]. This OTP is verified in the back-end and "Register.jsp" is shown, when the verification is happening. If verification is successful, the user is redirected to "Dashboard.html", which is the main dashboard of the project.


Register Portal
Untitled document - Google Doc
http://localhost:8080/BasicWebApplication/default.jsp
NO ENTRY

REGISTER TO AUTO PARK

We provide car parking slots across India.

LOGIN

✎ REGISTER HERE

Abhinav Verma

Last name

User name

f20201093@hyderabad.bits-pilani.ac.in

Phone number(10 digit)

Car Resistration No

Residential Address

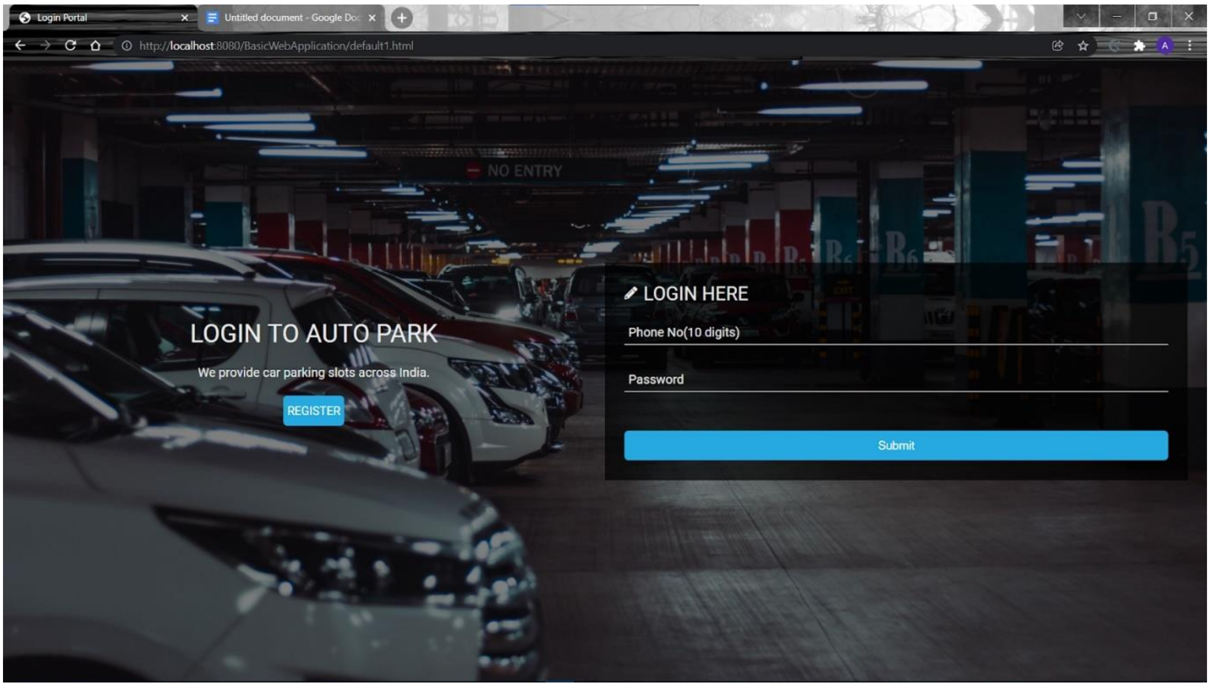
Password

Confirm Password

I accept the terms and conditions: ●

Submit

b) If the user clicks on login in "default.jsp", he is then redirected to "login.html", where he has to enter the details to log in. These details are — verified in the back-end (verified according to 'users' table in MySQL). If verification is successful, then the user is redirected to "Dashboard.html".


Login Portal
Untitled document - Google Doc
http://localhost:8080/BasicWebApplication/default1.html
NO ENTRY

LOGIN TO AUTO PARK

We provide car parking slots across India.

REGISTER

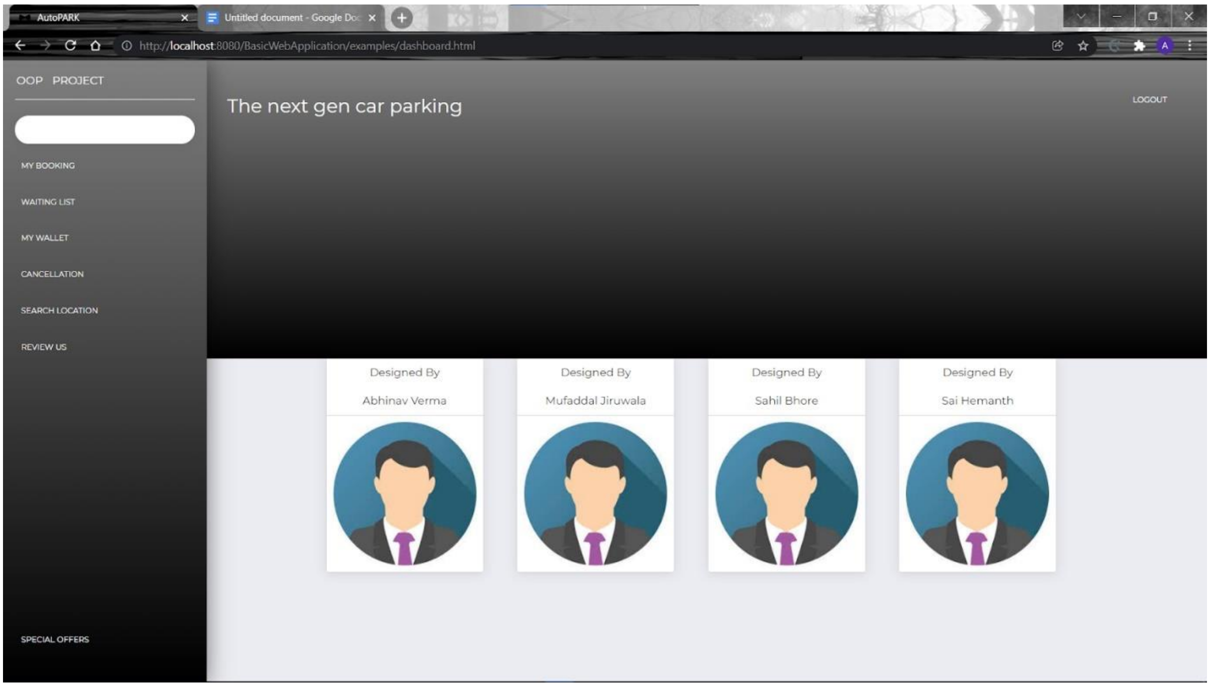
✎ LOGIN HERE

Phone No(10 digits)

Password

Submit

3) In the dashboard, the user comes across many options in the palette to the left. The options are 'My booking', 'waiting list', 'my wallet', 'cancellation', 'search location' and 'review us'

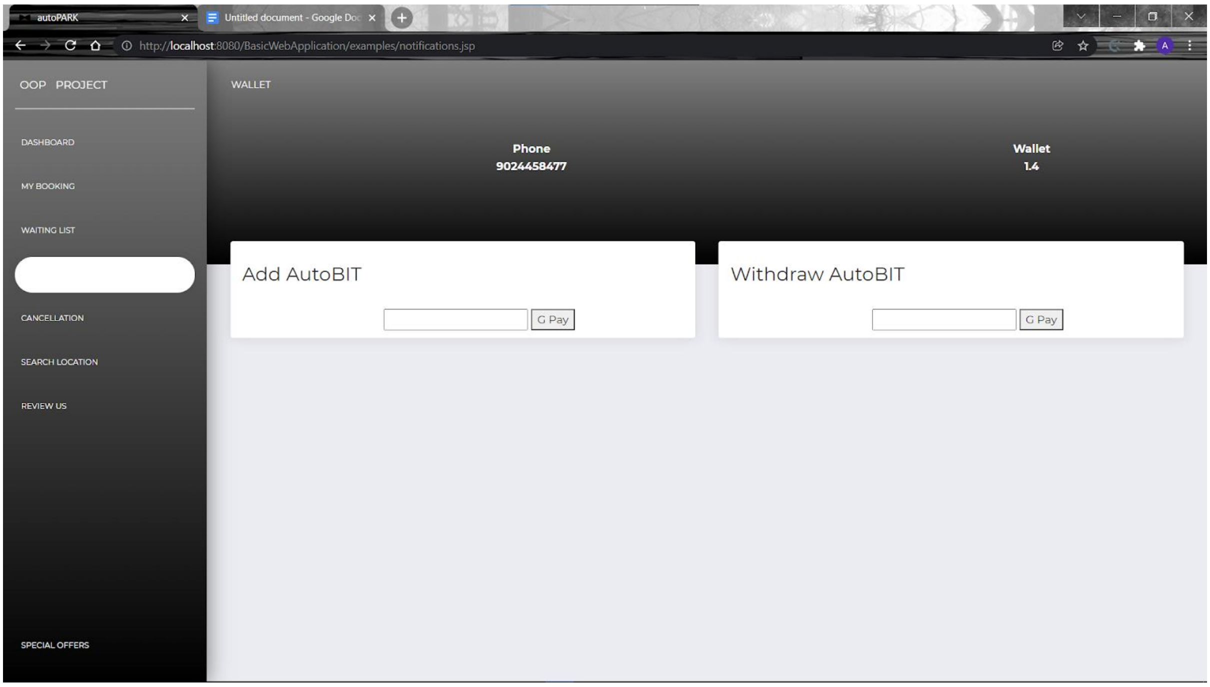


http://localhost:8080/BasicWebApplication/examples/dashboard.html

The next gen car parking

Designed By	Designed By	Designed By	Designed By
Abhinav Verma	Mufaddal Jiruwala	Sahil Bhore	Sai Hemanth

4) If the user is a first-time user, he has to click on My Wallet to recharge his autoBITs [2]. Clicking on it redirects the user to “notifications.jsp”. Here, the user has the option to add or remove autoBITs. Here he can enter the amount is rupees, and it’ll be converted to equivalent number of autoBITs according to the conversion 1 autoBIT = Rs. 1000.

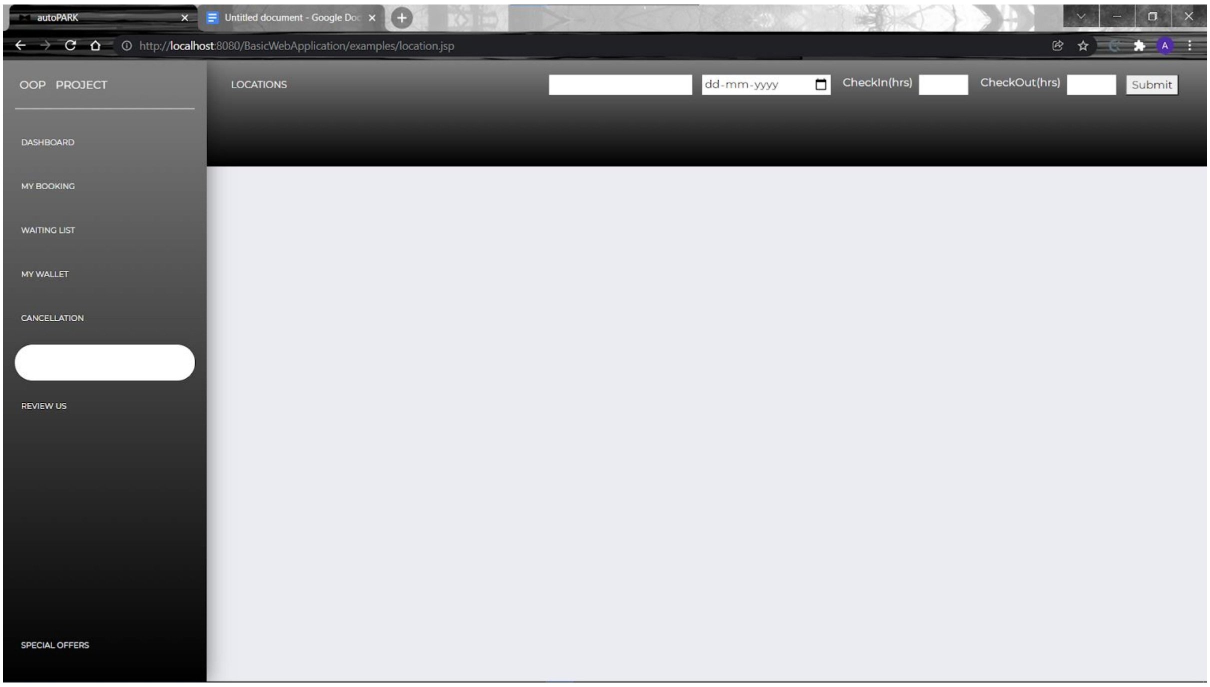


http://localhost:8080/BasicWebApplication/examples/notifications.jsp

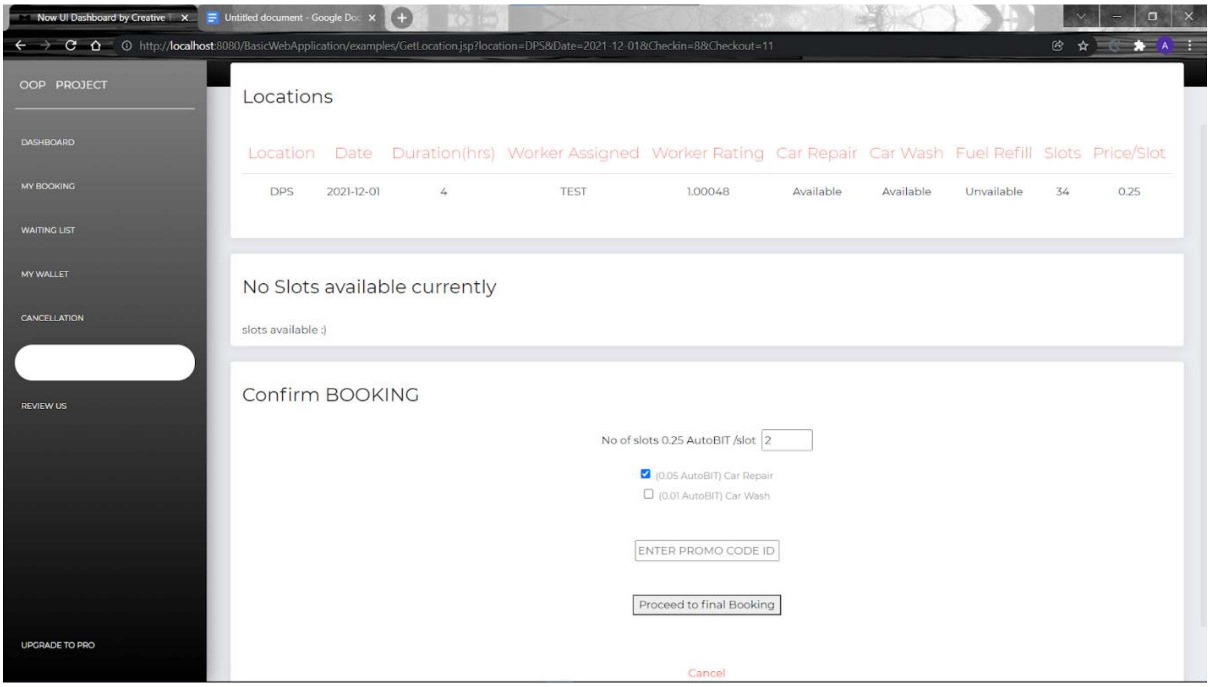
Phone
9024458477

Wallet
1.4

5) The user then has to select ‘Search Location’ option in the palette to search for the location of the parking slot and to book them. Clicking on it will redirect the user to “location.jsp”.



Here, the user has to enter the location, date, in-time and out-time, and clicks on submit. He'll then be redirected to "GetLocation.jsp"


Now UI Dashboard by Creative
Untitled document - Google Doc
http://localhost:8080/BasicWebApplication/examples/GetLocation.jsp?location=DPS&Date=2021-12-01&Checkin=8&Checkout=11
OOP PROJECT
DASHBOARD
MY BOOKING
WAITING LIST
MY WALLET
CANCELLATION
REVIEW US
UPGRADE TO PRO

Locations

Location	Date	Duration(hrs)	Worker Assigned	Worker Rating	Car Repair	Car Wash	Fuel Refill	Slots	Price/Slot
DPS	2021-12-01	4	TEST	1.00048	Available	Available	Unvailable	34	0.25

No Slots available currently

slots available :)

Confirm BOOKING

No of slots 0.25 AutoBIT /slot 2

☑ (0.05 AutoBIT) Car Repair

☐ (0.01 AutoBIT) Car Wash

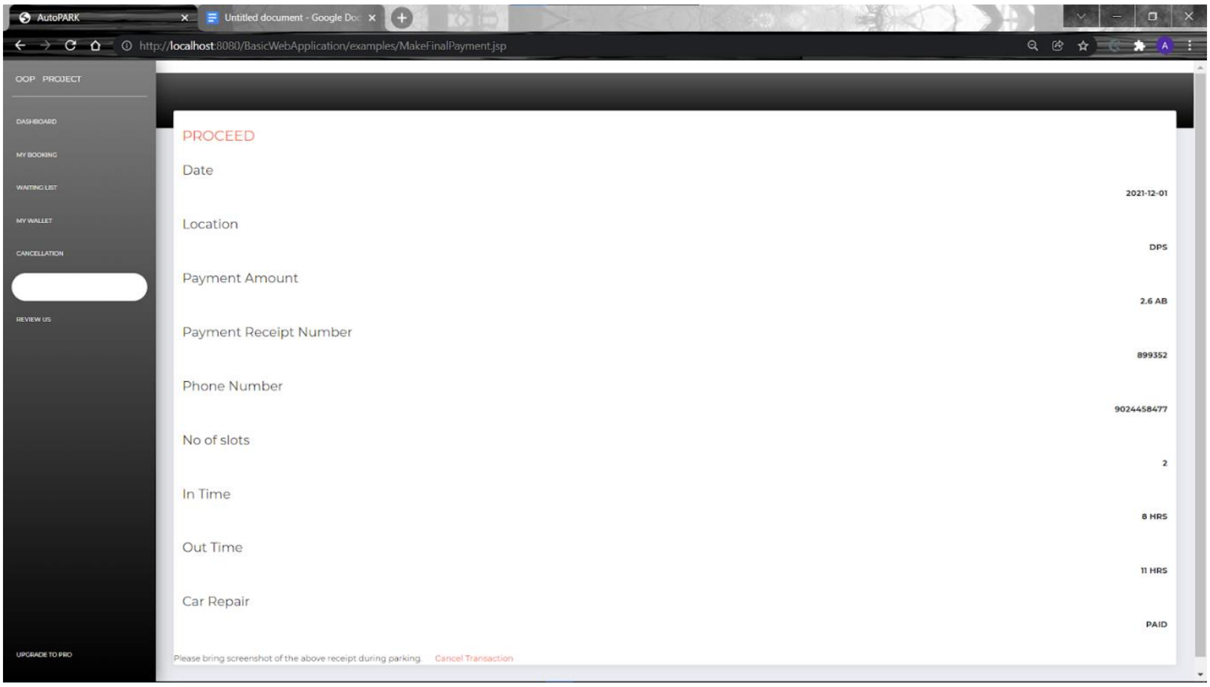
ENTER PROMO CODE ID

Proceed to final Booking

Cancel

Here, the user has to select the number of slots, and has to confirm booking. We can see that during the time selected by the user, there are no available slots. Hence, he will be directed to the waiting list, "WaitingListAllocation.jsp".

If slots are available, the user has to confirm booking by selecting the number of slots he wants and paying equivalent autoBITs. The user will then be directed to "MakeFinalPayment.jsp", where he has to confirm booking once again.



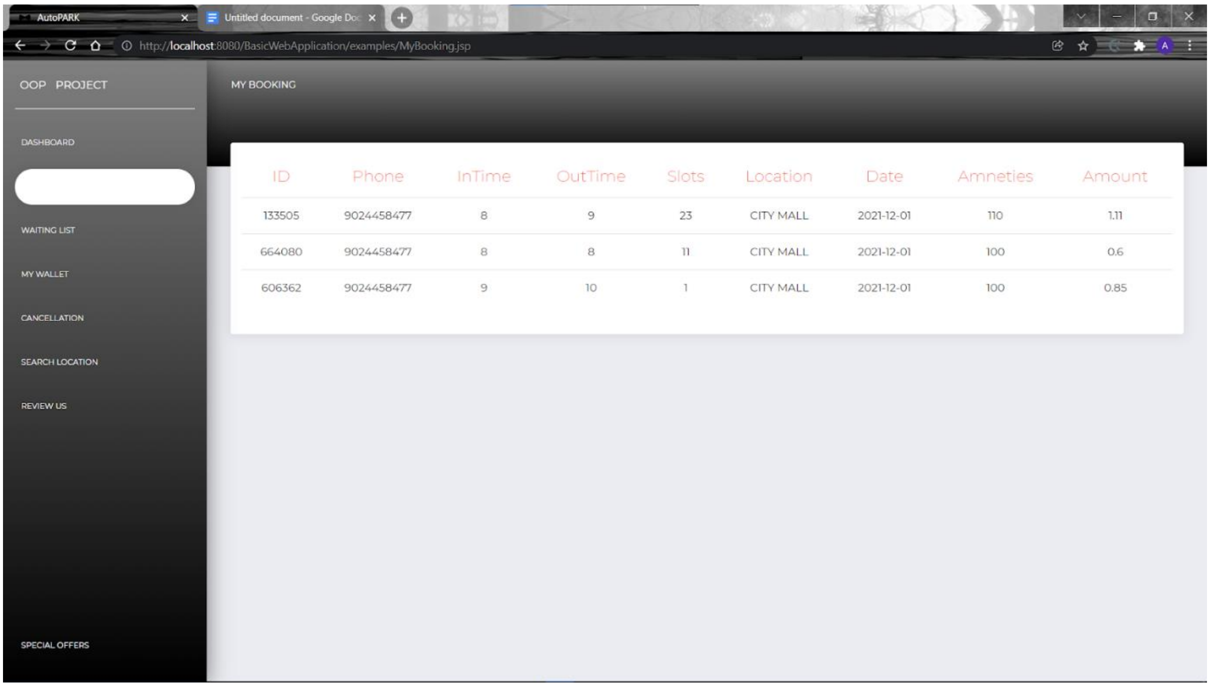
PROCEED

Date	2021-12-01
Location	DPS
Payment Amount	2.6 AB
Payment Receipt Number	899352
Phone Number	9024458477
No of slots	2
In Time	8 HRS
Out Time	11 HRS
Car Repair	PAID

Please bring screenshot of the above receipt during parking.

If the user wishes to cancel his booking, he'll be redirected to "Cancellation.jsp".

6) After booking confirmation, the user can check his current bookings in the "My booking" tab in the palette.

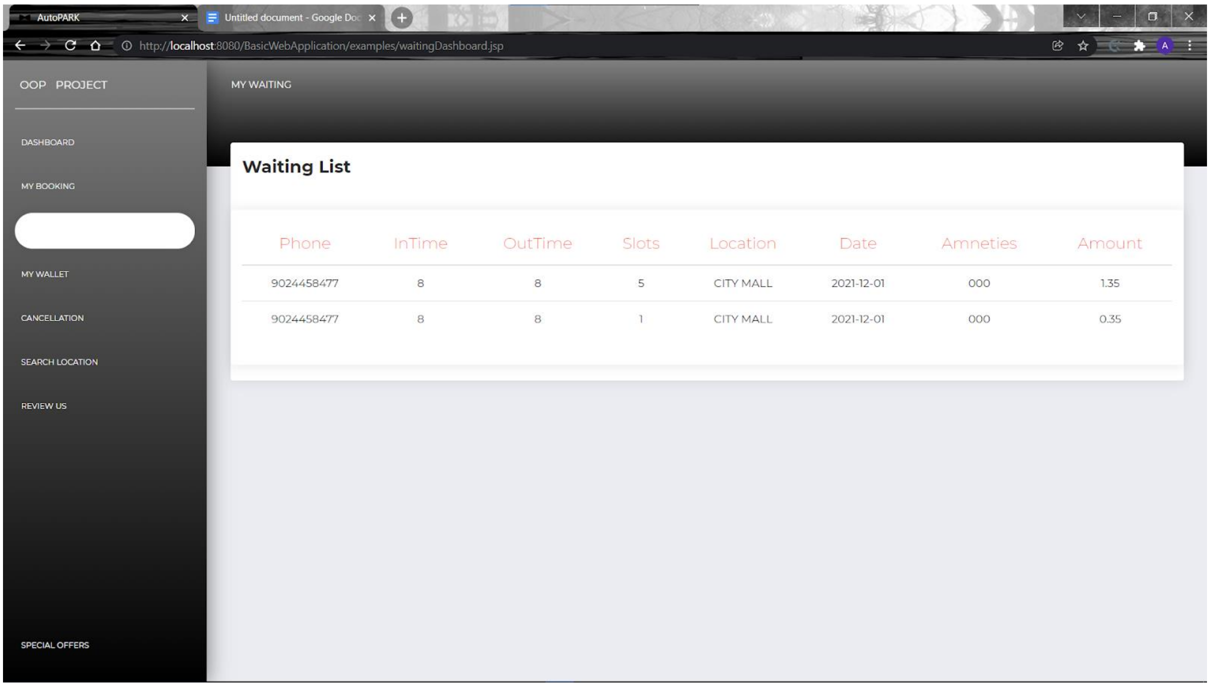


MY BOOKING

ID	Phone	InTime	OutTime	Slots	Location	Date	Amneties	Amount
133505	9024458477	8	9	23	CITY MALL	2021-12-01	110	1.11
664080	9024458477	8	8	11	CITY MALL	2021-12-01	100	0.6
606362	9024458477	9	10	1	CITY MALL	2021-12-01	100	0.85

Here, as we can see, the user has already made 2 bookings in the past, and his current booking is also visible in the list.

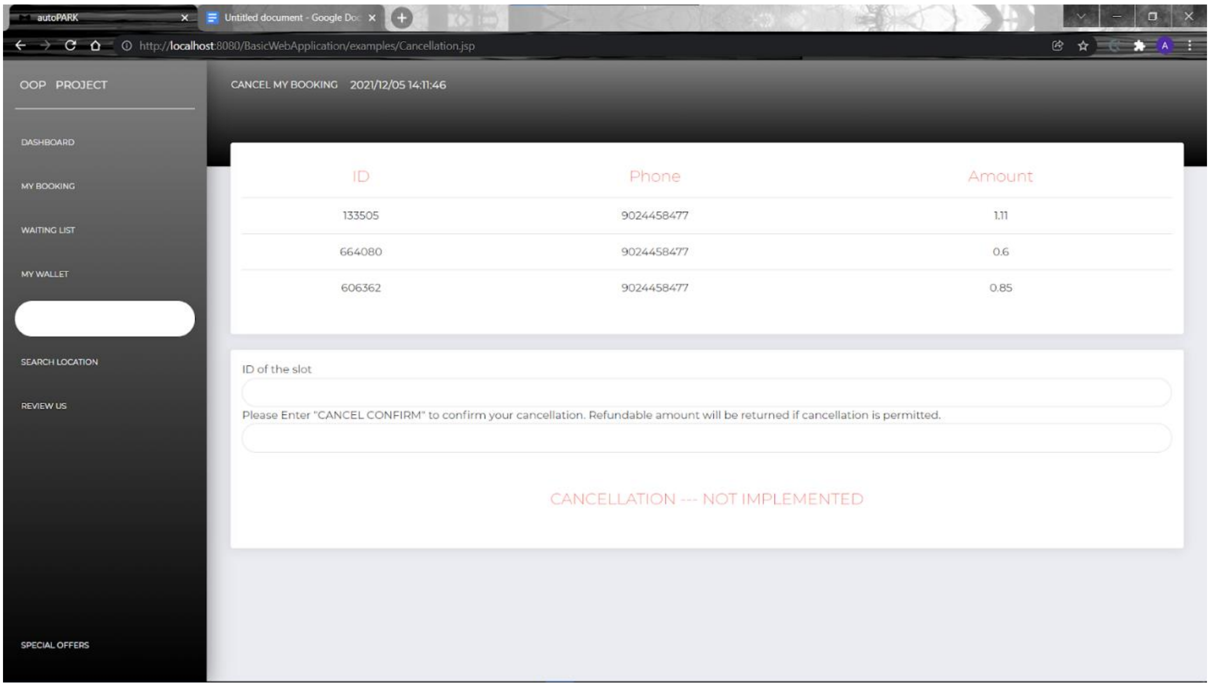
7) If the user has been allocated to the waiting list, he can click on 'Waiting List' in the palette. He will then be redirected to "WaitingDashboard.jsp", where he can see the waiting list.



Waiting List

Phone	InTime	OutTime	Slots	Location	Date	Amneties	Amount
9024458477	8	8	5	CITY MALL	2021-12-01	000	1.35
9024458477	8	8	1	CITY MALL	2021-12-01	000	0.35

8) If the user wishes to cancel his booking, he has to select the ‘cancellation’ tab in the palette. He will be redirected to “cancellation.jsp”.



autoPARK
Untitled document - Google Doc
http://localhost:8080/BasicWebApplication/examples/Cancellation.jsp
OOP PROJECT
DASHBOARD
MY BOOKING
WAITING LIST
MY WALLET
SEARCH LOCATION
REVIEW US
SPECIAL OFFERS

CANCEL MY BOOKING 2021/12/05 14:11:46

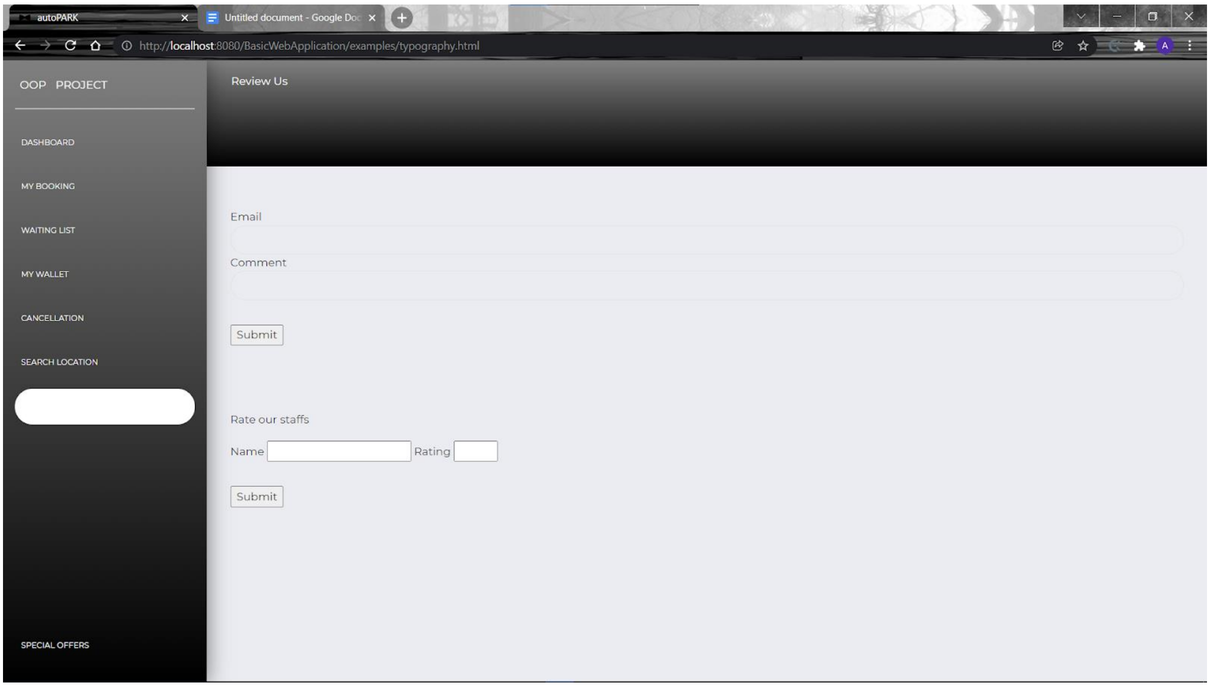
ID	Phone	Amount
133505	9024458477	1.11
664080	9024458477	0.6
606362	9024458477	0.85

ID of the slot

Please Enter "CANCEL CONFIRM" to confirm your cancellation. Refundable amount will be returned if cancellation is permitted.

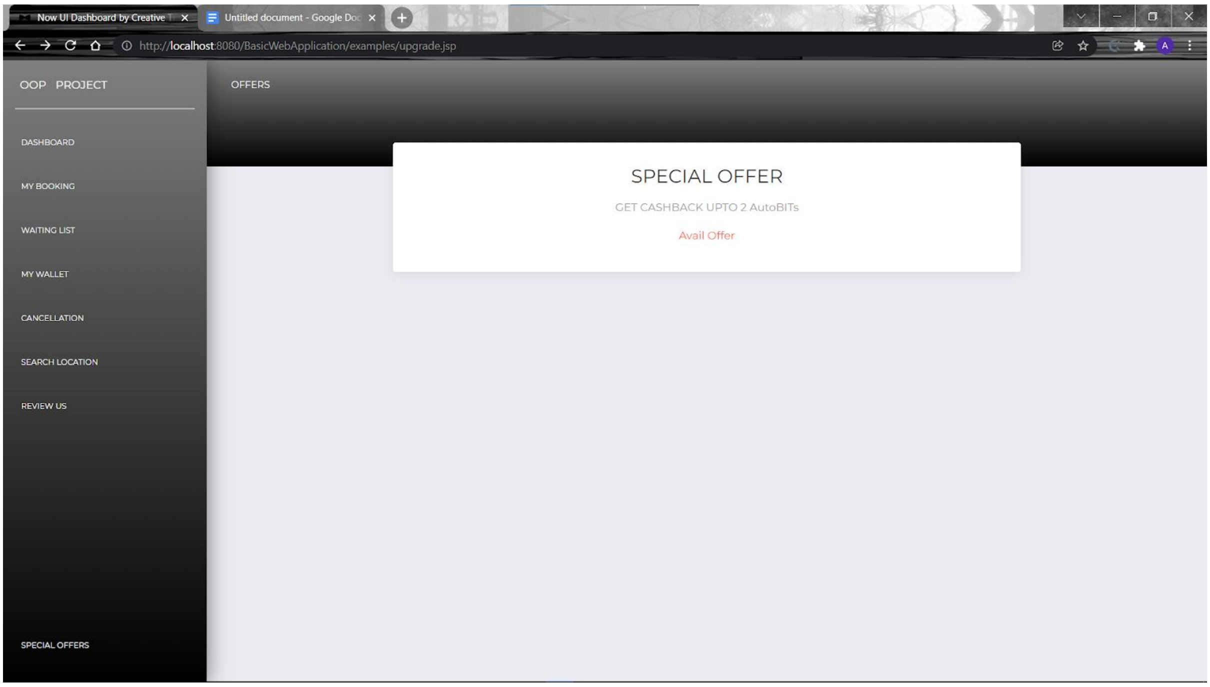
CANCELLATION --- NOT IMPLEMENTED

9) If the user wishes to review the worker, he/ she has to select the ‘Review us’ option in the palette, wherein they’ll be redirected to “typography.html”.



Here, the user has the option to write down their feedback, and rate the worker. Here the feedback will directly be sent to the admin portal. If the user reviews the worker who was in-charge of the facilities like car-wash etc., they'll be redirected to "WorkerReview.jsp".

10) **Special Offer Implementation:** We have also designed a system wherein if the user uses our facilities more than five times, he/ she will be eligible for 10% discount the next time he/she uses our facilities.
If the user selects the Special Offer tab, he will be redirected to "upgrade.jsp"

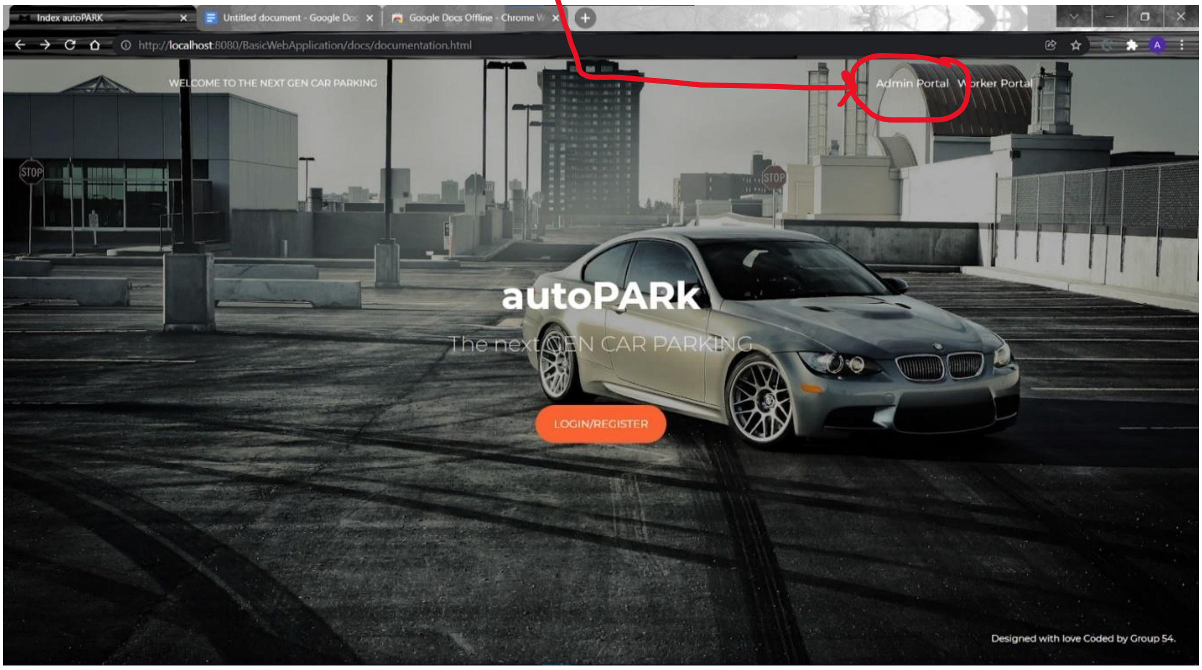

Now UI Dashboard by Creative T
Untitled document - Google Doc
http://localhost:8080/BasicWebApplication/examples/upgrade.jsp
OOP PROJECT
DASHBOARD
MY BOOKING
WAITING LIST
MY WALLET
CANCELLATION
SEARCH LOCATION
REVIEW US
SPECIAL OFFERS
OFFERS
SPECIAL OFFER
GET CASHBACK UPTO 2 AutoBITs
Avail Offer

If the user selects 'Avail offer', he'll be redirected to "Promocode.jsp", wherein he has to enter the promo code sent to his mobile number via SMS.

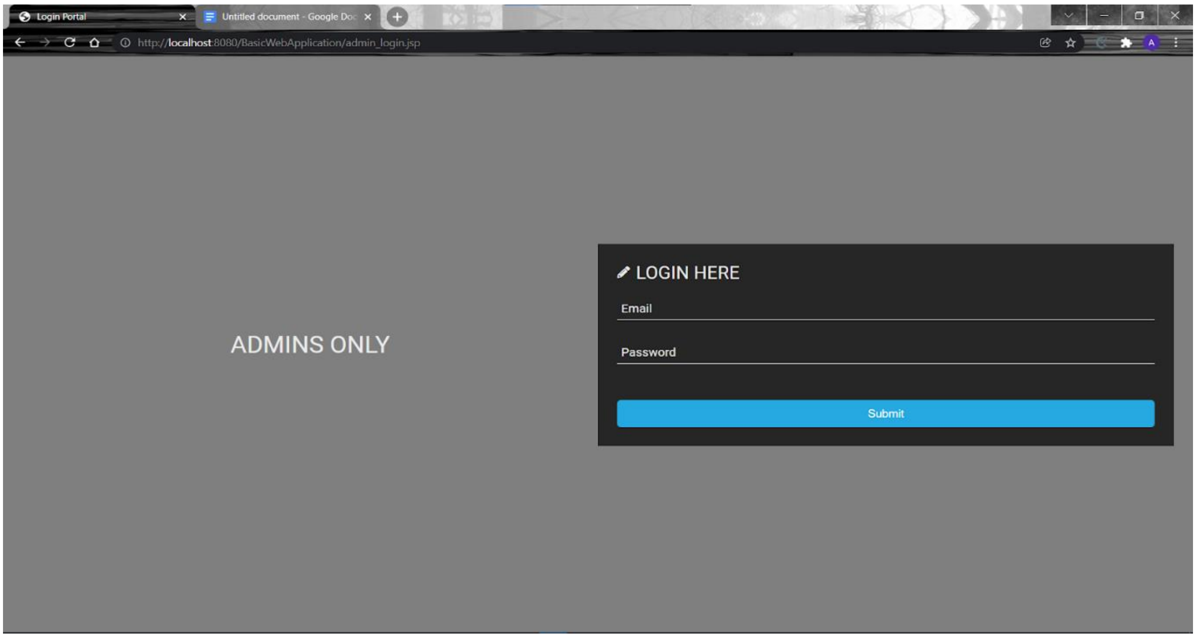
This promo code will then be verified and then the user will be redirected to "location.jsp" where he can book a slot for the future.

Admin interface

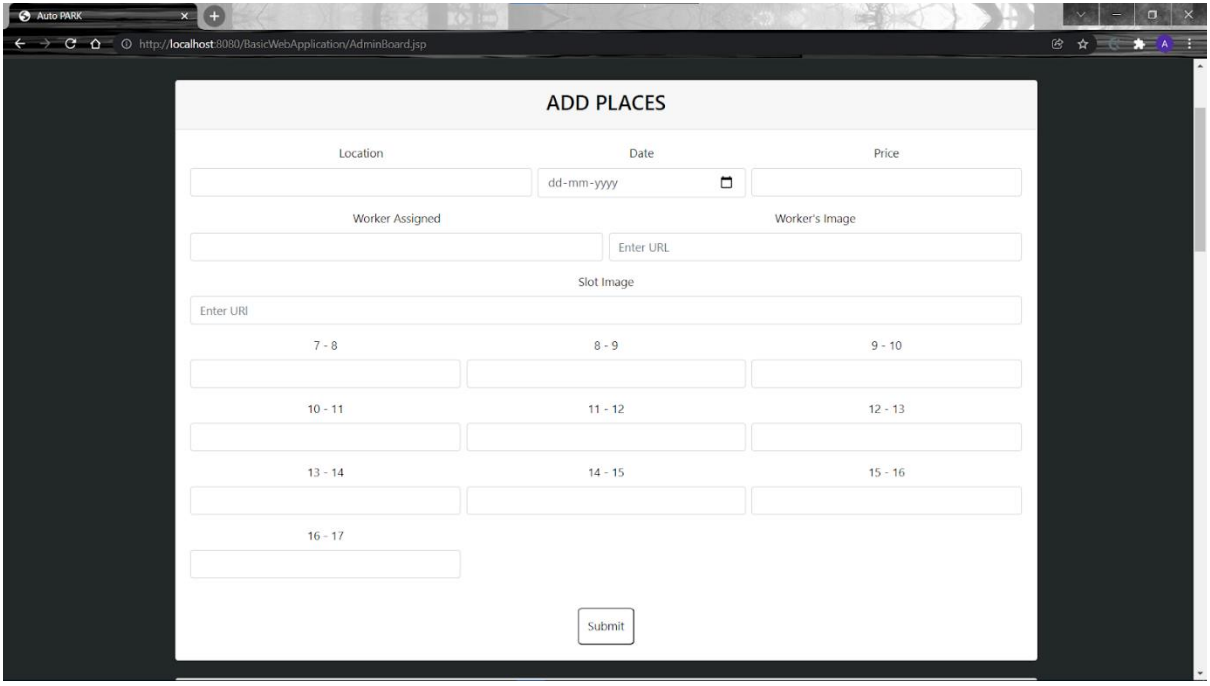
1) The admin can log in via the 'admin portal' link in "index.jsp"


Index autoPARK
Untitled document - Google Doc
Google Docs Offline - Chrome W
http://localhost:8080/BasicWebApplication/docs/documentation.html
WELCOME TO THE NEXT GEN CAR PARKING
Admin Portal
Worker Portal
autoPARk
The next GEN CAR PARKING
LOGIN/REGISTER
Designed with love Coded by Group 54.

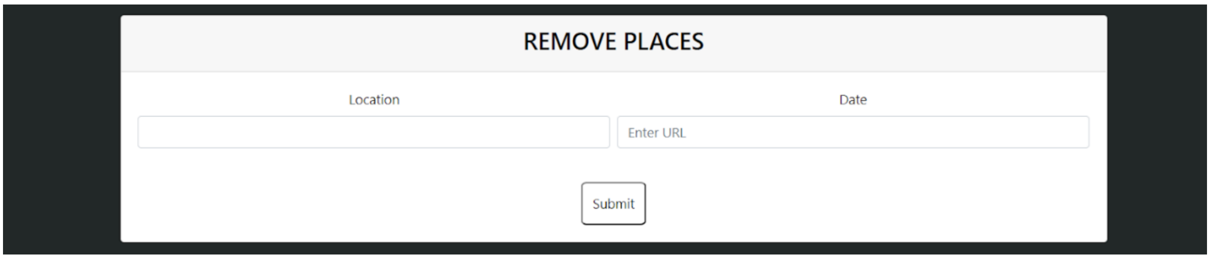
2) The admin will then be redirected to "administer_login.jsp", where the admin has to enter his details to log in.


Login Portal
Untitled document - Google Doc
http://localhost:8080/BasicWebApplication/admin_login.jsp
ADMINS ONLY
LOGIN HERE
Email
Password
Submit

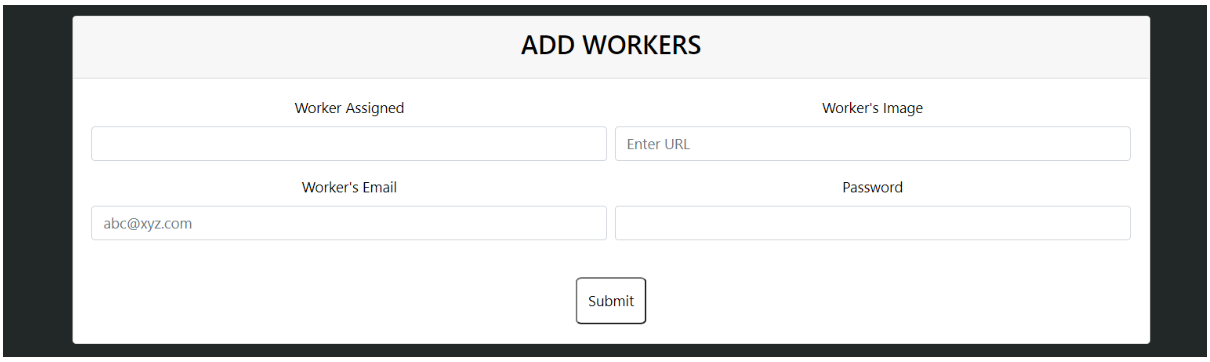
3) Then the page is redirected to "administer_login.jsp", which verifies and logs in the admin.
4) The admin is redirected to "AdminBoard.jsp", which lets him add places, remove places, add workers and remove workers.



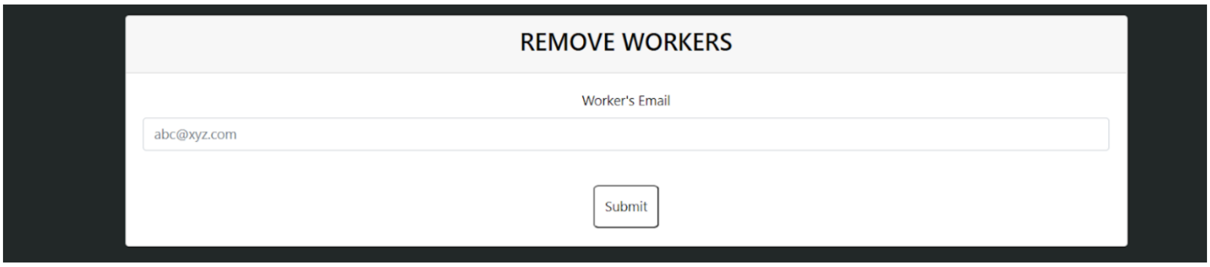
Add places redirects to "InsertPlaces.jsp".
Remove places redirects to "DeletePlaces.jsp".



5) Add workers redirects to "AddWorkers.jsp"



6) Remove workers redirects to "RemoveWorker.jsp".

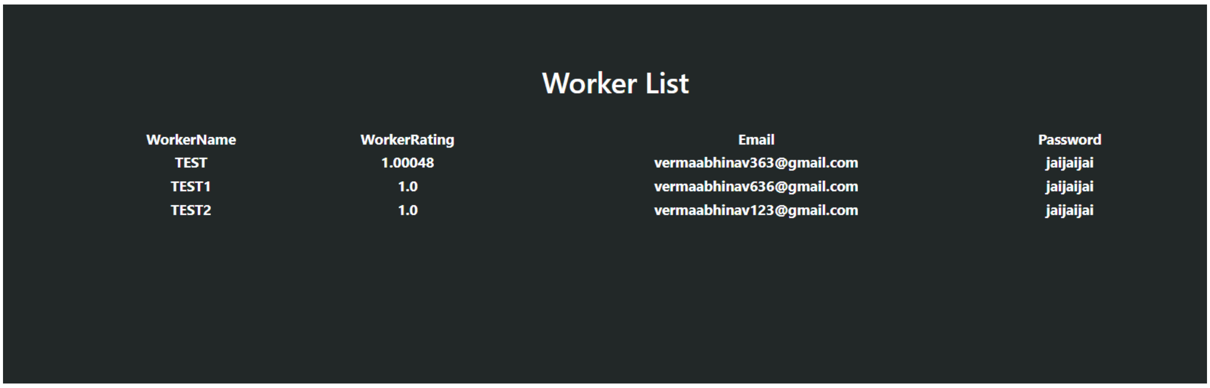


REMOVE WORKERS

Worker's Email

abc@xyz.com

7) The admin portal also shows the list of workers and their ratings.

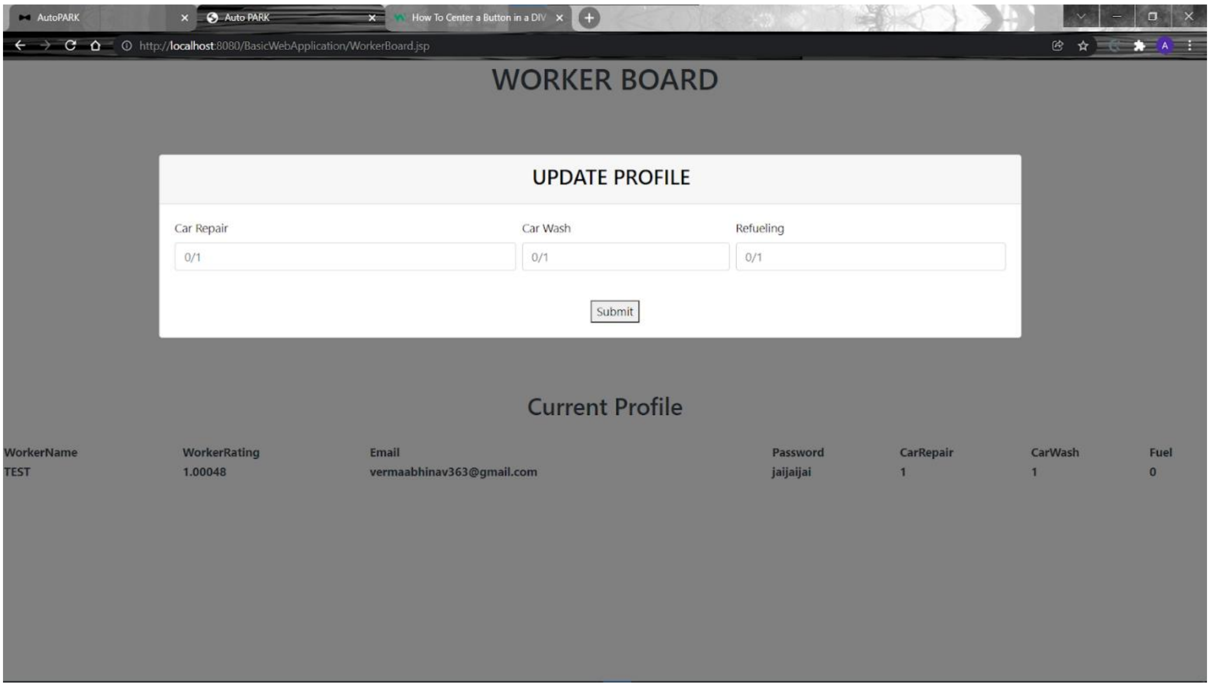


Worker List

WorkerName	WorkerRating	Email	Password
TEST	1.00048	vermaabhinav363@gmail.com	jaijaijai
TEST1	1.0	vermaabhinav636@gmail.com	jaijaijai
TEST2	1.0	vermaabhinav123@gmail.com	jaijaijai

Worker interface

1) The workers providing the facilities can also login from the "index.jsp" page. They will be redirected to "WorkerBoard.jsp"



AutoPARK
Auto PARK
How To Center a Button in a DIV
http://localhost:8080/BasicWebApplication/WorkerBoard.jsp

WORKER BOARD

UPDATE PROFILE

Car Repair: 0/1

Car Wash: 0/1

Refueling: 0/1

Current Profile

WorkerName	WorkerRating	Email	Password	CarRepair	CarWash	Fuel
TEST	1.00048	vermaabhinav363@gmail.com	jaijaijai	1	1	0

2) If the worker chooses to update the facilities in the website, it'll throw him to "UpdateWorker.jsp"

1. APIs used:

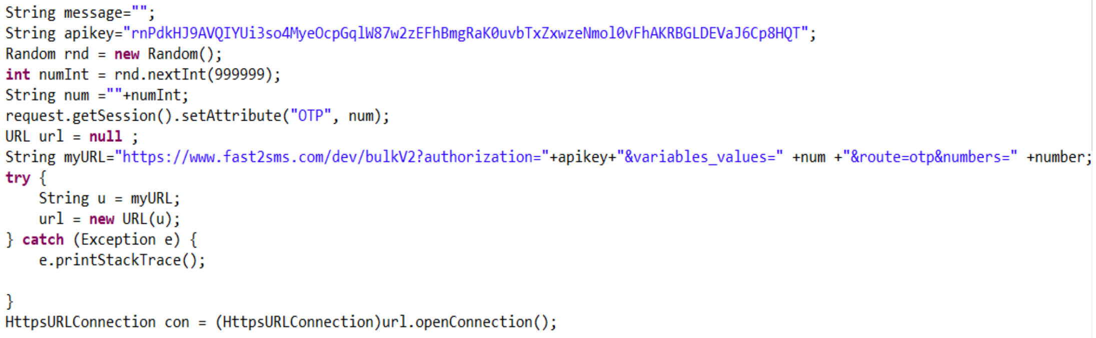
1) SMS API: The API used here is 'fast2SMS'.

"`curl -X GET \`

a. `'https://www.fast2sms.com/dev/bulkV2?authorization=YOUR_API_KEY&message=This is test message&language=english&route=q&numbers=9999999999,8888888888,7777777777'`

b. The above-mentioned statement is used to call the API to our program. It contains the API key.

c. We also see the code used in the html file:

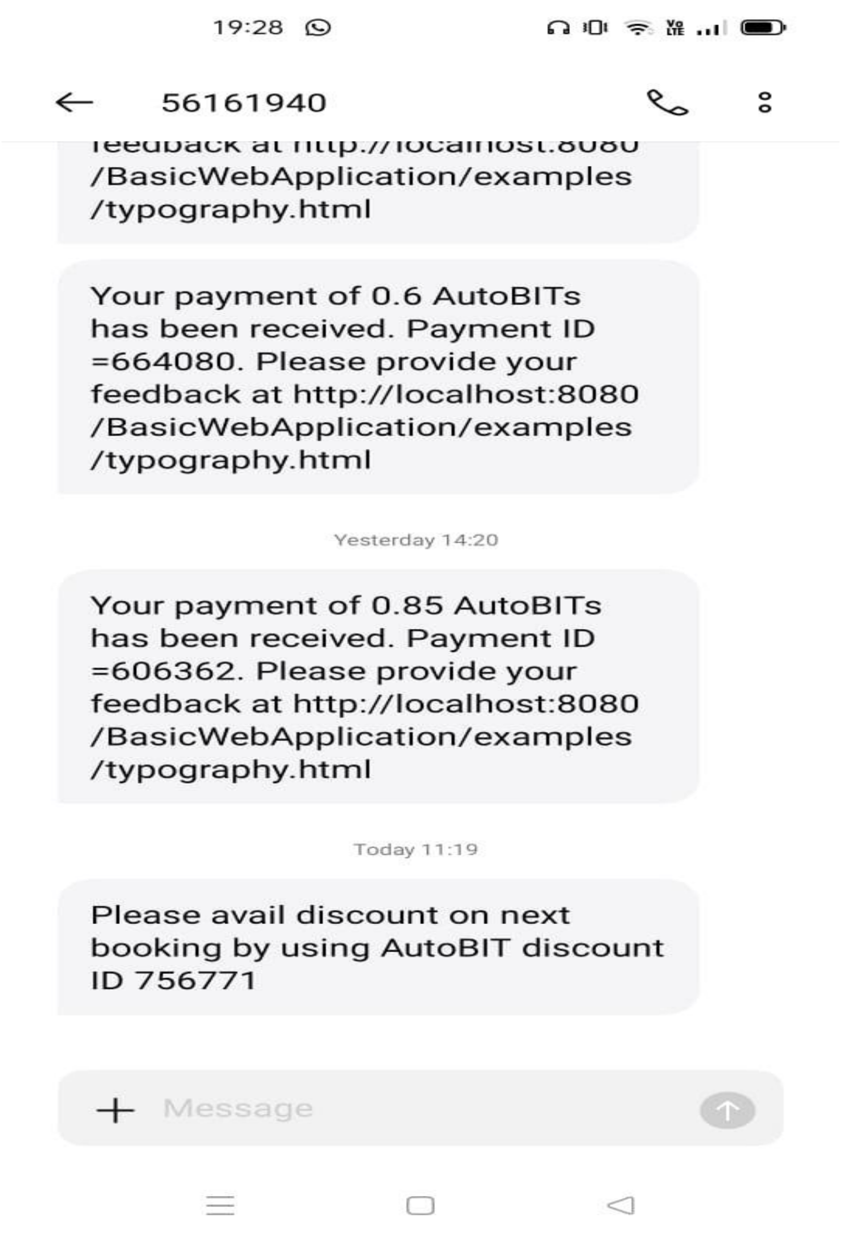


```
String message="";
String apikey="rnPdkHJ9AVQIYUi3so4MyeOcpGqlW87w2zEFhBmgRaK0uvbTxZxwzeNmol0vFhAKRBGLDEVaJ6Cp8HQT";
Random rnd = new Random();
int numInt = rnd.nextInt(999999);
String num =""+numInt;
request.getSession().setAttribute("OTP", num);
URL url = null ;
String myURL="https://www.fast2sms.com/dev/bulkV2?authorization="+apikey+"&variables_values=" +num +"&route=otp&numbers=" +number;
try {
    String u = myURL;
    url = new URL(u);
} catch (Exception e) {
    e.printStackTrace();

}
HttpsURLConnection con = (HttpsURLConnection)url.openConnection();
```

d. This is the SMS success response:

```
{
    "return": true,
    "request_id": lwdtp7cjyqxvfe9",
    "message": [
        "Message sent successfully"
    ]
```



feedback at http://localhost:8080 /BasicWebApplication/examples /typography.html

Your payment of 0.6 AutoBITs has been received. Payment ID =664080. Please provide your feedback at http://localhost:8080 /BasicWebApplication/examples /typography.html

Yesterday 14:20

Your payment of 0.85 AutoBITs has been received. Payment ID =606362. Please provide your feedback at http://localhost:8080 /BasicWebApplication/examples /typography.html

Today 11:19

Please avail discount on next booking by using AutoBIT discount ID 756771

We can see that we have implemented the SMS API from the above screenshot

2) Google sign-in API:

a) We call the google API by first creating a project and a client ID in the google developer's console. We then integrate the ID in our html code, so that the sign-in API is called. The code for integrating is:

```
<meta name="google-signin-client_id"
content="YOUR_CLIENT_ID.apps.googleusercontent.com">
```

b) This statement is used to integrate the button into the html code:

```
<div class="g-signin2" data-onsuccess="onSignIn"></div>
```

c)

```
function onSignIn(googleUser) {
  var profile = googleUser.getBasicProfile();
  console.log('ID: ' + profile.getId()); // Do not send
to your backend! Use an ID token instead.
  console.log('Name: ' + profile.getName());
  console.log('Image URL: ' + profile.getImageUrl());
  console.log('Email: ' + profile.getEmail()); // This is
null if the 'email' scope is not present.
}
```

The above JS function is used for getting the profile on sign in.

2. Introducing autoBIT:

We have implemented a new form of payment in our parking system, called autoBIT. This new form of currency is hassle-free and can easily be used to book your slots. As of now, the conversion rate stands at 1autoBIT (or AB for short) = Rs. 1000.

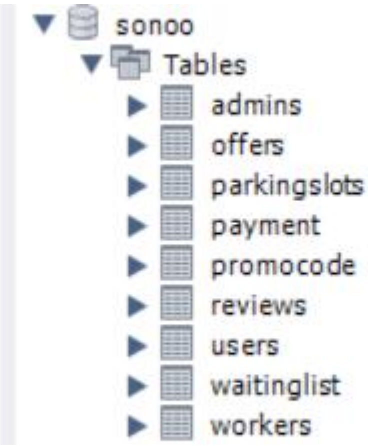
autoBITs can easily be added to your wallet via popular payment gateways like GPay. Customers can use autoBITs to easily avail offers and promo-codes.

Back-end Implementation:

We have used MySQL for storing our database tables and used Apache Tomcat v9.0 as our server. All of the back-end coding was done on Eclipse Enterprise Edition, and in Java, html and CSS. We've also used JSP- Java Server Pages.

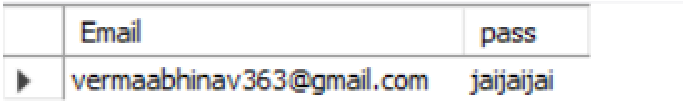
MySQL Tables:

The tables we've created in our database are:



sonoo
Tables
- admins
- offers
- parkingslots
- payment
- promocode
- reviews
- users
- waitinglist
- workers

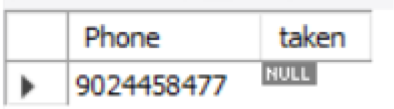
1) Admins: Contains the details of all the admins.



Email	pass
vermaabhinav363@gmail.com	jaijaijai

This is the snapshot of the admin table. It contains the login details of all the admins.

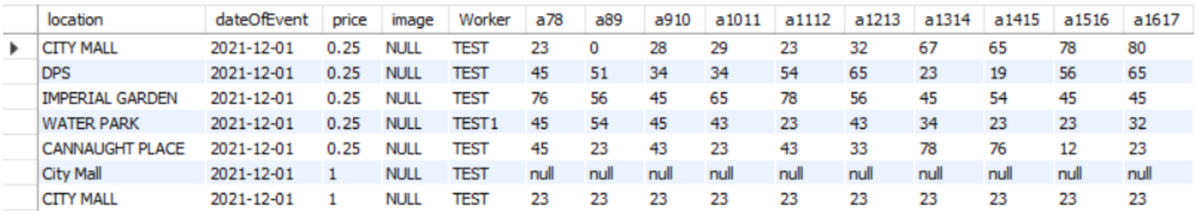
2) Offers: Contains the list of users eligible for offers.



Phone	taken
9024458477	NULL

This is the snapshot of the offers table. It shows the phone numbers eligible for offers and shows if the user has claimed the offer or not.

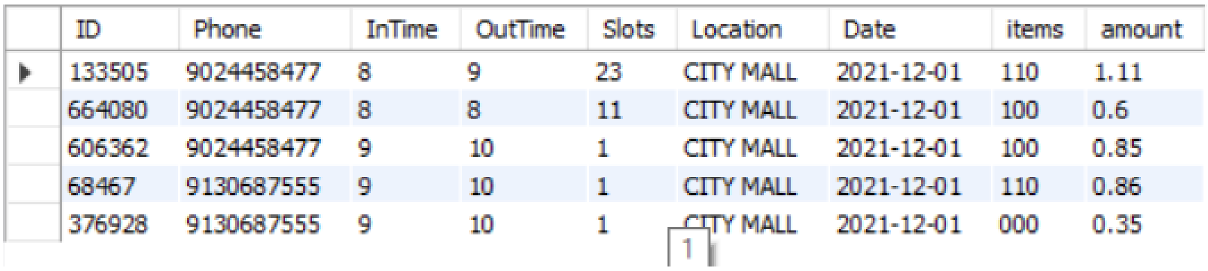
3) Parkingslots: Contains the details about all available parking slots.



location	dateOfEvent	price	image	Worker	a78	a89	a910	a1011	a1112	a1213	a1314	a1415	a1516	a1617
CITY MALL	2021-12-01	0.25	NULL	TEST	23	0	28	29	23	32	67	65	78	80
DPS	2021-12-01	0.25	NULL	TEST	45	51	34	34	54	65	23	19	56	65
IMPERIAL GARDEN	2021-12-01	0.25	NULL	TEST	76	56	45	65	78	56	45	54	45	45
WATER PARK	2021-12-01	0.25	NULL	TEST1	45	54	45	43	23	43	34	23	23	32
CANNAUGHT PLACE	2021-12-01	0.25	NULL	TEST	45	23	43	23	43	33	78	76	12	23
City Mall	2021-12-01	1	NULL	TEST	null	null	null	null	null	null	null	null	null	null
CITY MALL	2021-12-01	1	NULL	TEST	23	23	23	23	23	23	23	23	23	23

This is the parkingslots table. Its shows the available locations for parking slots and shows the number of slots available.

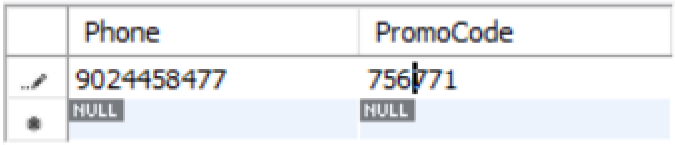
4) Payment: Contains payment details



ID	Phone	InTime	OutTime	Slots	Location	Date	items	amount
133505	9024458477	8	9	23	CITY MALL	2021-12-01	110	1.11
664080	9024458477	8	8	11	CITY MALL	2021-12-01	100	0.6
606362	9024458477	9	10	1	CITY MALL	2021-12-01	100	0.85
68467	9130687555	9	10	1	CITY MALL	2021-12-01	110	0.86
376928	9130687555	9	10	1	CITY MALL	2021-12-01	000	0.35

This is the payment table. It shows the phone number of the users who have booked slots and have paid.

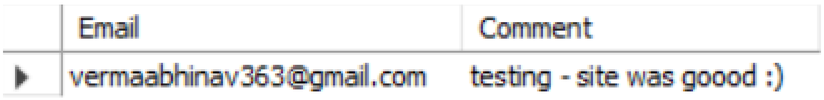
5) Promocode: Contains the promocodes used for availing offers. Used for verification.



Phone	PromoCode
9024458477	756771
NULL	NULL

This is the promocode table. It shows the phone numbers who have taken up the offer and generates their promocodes.

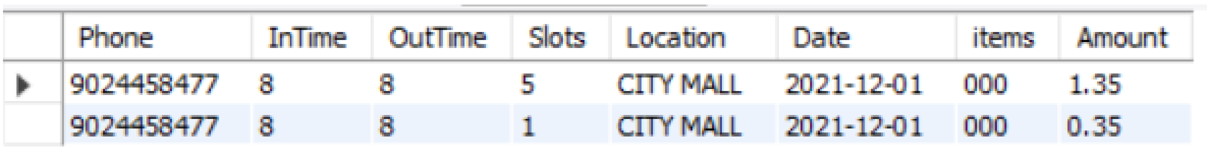
6) Reviews: Contains all the reviews written by users.



Email	Comment
vermaabhinav363@gmail.com	testing - site was goood :)

This is the reviews table. It shows the email and the reviews of the users.

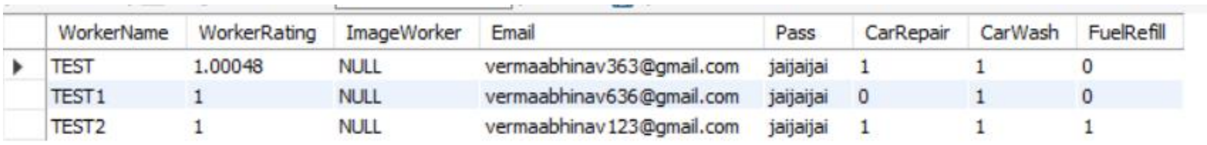
7) Waitinglist: Contains the details of all the members in the waiting list.



Phone	InTime	OutTime	Slots	Location	Date	items	Amount
9024458477	8	8	5	CITY MALL	2021-12-01	000	1.35
9024458477	8	8	1	CITY MALL	2021-12-01	000	0.35

This is the waiting list table; it shows the users who are awaiting their slots.

8) Workers: Contains the details of all the workers.



WorkerName	WorkerRating	ImageWorker	Email	Pass	CarRepair	CarWash	FuelRefill
TEST	1.00048	NULL	vermaabhinav363@gmail.com	jaijaijai	1	1	0
TEST1	1	NULL	vermaabhinav636@gmail.com	jaijaijai	0	1	0
TEST2	1	NULL	vermaabhinav123@gmail.com	jaijaijai	1	1	1

This is the worker table, it shows the list of the workers, their details, and the facilities offered by them.

THANK YOU