

ITCS 6112 – SOFTWARE SYSTEM DESIGN AND IMPLEMENTATION

ONLINE CAR BOOKING SERVICE

TEAM:

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1. Abstract

More than two-thirds of automotive customers indicate that Service Convenience is a determining factor in selecting a brand or purchasing from a Specific dealership .Consequently, Customer Service and service management is of vital relevance to ensure ongoing Customer loyalty and retention and ultimately, dealer Profitability.

Dealer Business Management enables efficient Service order Processing and billing designed for any given number of orders per day .it includes Service requests and Scheduling ,Optimization of technicians, tools , and parts as well as their deployment and scheduling .User friendly interfaces provides ease of use and the integration technology ensure a seamless and smooth business process into OEM channel System, including ,job and Package Catalogs, Vehicle history files ,Warranty Systems, etc. Service monitoring and analysis increases the Visibility in Overall fixed Operations and helps increases service Capacity utilization ,efficiency and decreased operating cost.

Recreation Vehicle service technician inspect ,test, service, and replace every system installed in a recreation Vehicle with the exception of the dry.

Both intervals are equally important for properly marinating your Vehicle Remember all Toyota dealerships offer a broad range of Parts and Service.

The Driver and Vehicle Licensing Agency ,the Driving Standards Agency and the Vehicle and Operator Service Agency Provide Services for 42 million drivers.

The Vehicle and Operator Services Agency(VOSA) Provides a range of licensing, testing and enforcement services with the aim of improving the roadworthiness standards of Vehicles ensuring the Compliance of operators and drivers , and Supporting the independent Traffic Commissioner.

2. Introduction

2.1. Existing System

Existing system is a manual one in which users are maintaining books to store the information like product details, Distributors details, purchases, sales details and accounts for every month. It is very difficult to maintain historical data.

The following are the disadvantages of the existing system

- It is difficult to maintain important information in books.

More manual hours need to generate required reports.

It is tedious to manage historical data which needs much space to keep all the previous years' ledgers, books etc.

Daily sales and purchases details must be entered into books are very difficult to maintain.

2.2. Proposed System

The Distributor's Service Management Tool is a software application which avoids more manual hours that need to spend in record keeping and generating reports. This application keeps the data in a centralized way which is available to all the users simultaneously. It is very easy to manage historical data in database. No specific training is required for the distributors to use this application. They can easily use the tool that decreases manual hours spending for normal things and hence increases the performance. It is very easy to record the information of online sales and purchases in the databases.

2.3. Objective of the System

The objective of the Vehicle Services is to provide better information for the users of this system for better results for their maintenance in the product details that is sales, purchases and stock.

3. Materials and Methods Summary

Design is the first step in the development phase for any techniques and principles for the purpose of defining a device, a process or system in enough detail to permit its physical realization.

Once the software requirements have been analysed and specified the software design involves three technical activities - design, coding, implementation and testing that are required to build and verify the software.

The design activities are of main importance in this phase, because in this activity, decisions ultimately affecting the success of the software implementation and its ease of maintenance are made. These decisions have the final bearing upon reliability and maintainability of the system. Design is the only way to accurately translate the customer's requirements into finished software or a system.

Design is the place where quality is fostered in development. Software design is a process through which requirements are translated into a representation of software. Software design is conducted in two steps. Preliminary design is concerned with the transformation of requirements into data.

3.3. Technical Requirements

Hardware Requirements:

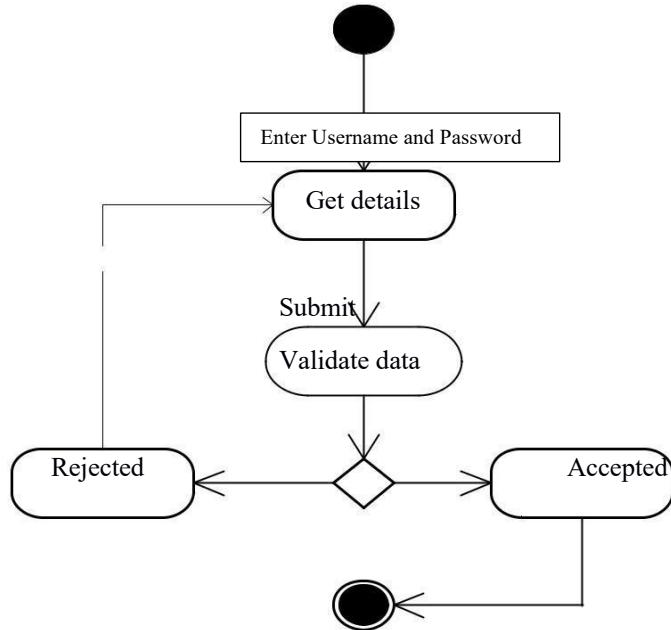
- Core i3 (Processor).
- 4 GB RAM
- 512 KB Cache Memory
- Hard Disk 10 GB

Software Requirements:

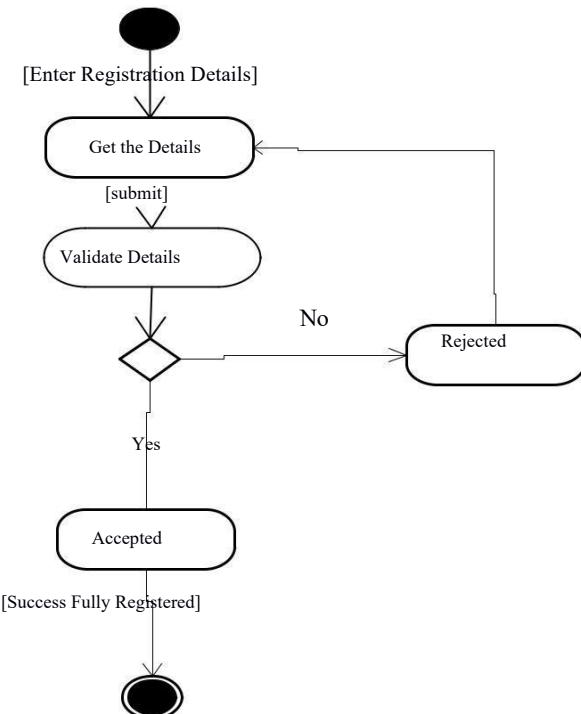
- **Operating System :** Windows, Linux, MacOS
- **Programming Language:** TypeScript
- **Web-Technology:** MEAN
- **Front-End:** Angular 4
- **Back-End:** MySQL
- **Web Server:** Express

4. Diagrams

4.1 Login Activity Diagram:

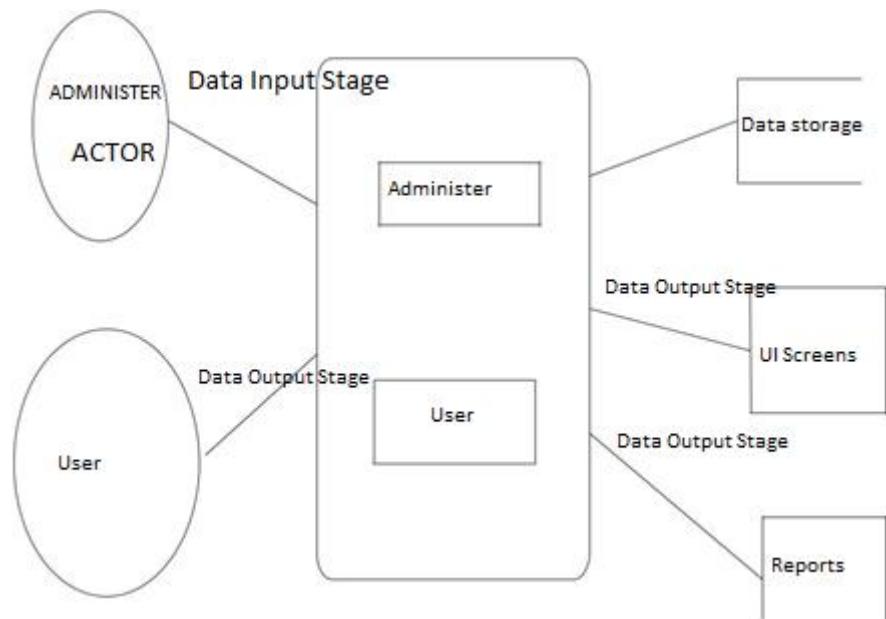


4.2 Registration Activity Diagram:

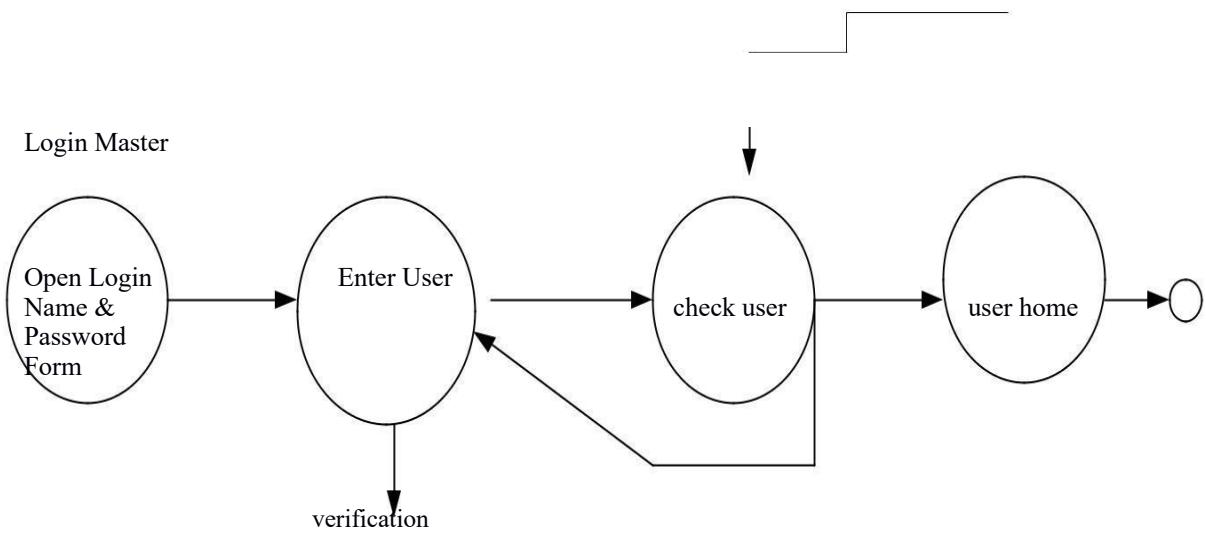


4.4. DFD Diagrams

4.4.1 Context Level Diagram:

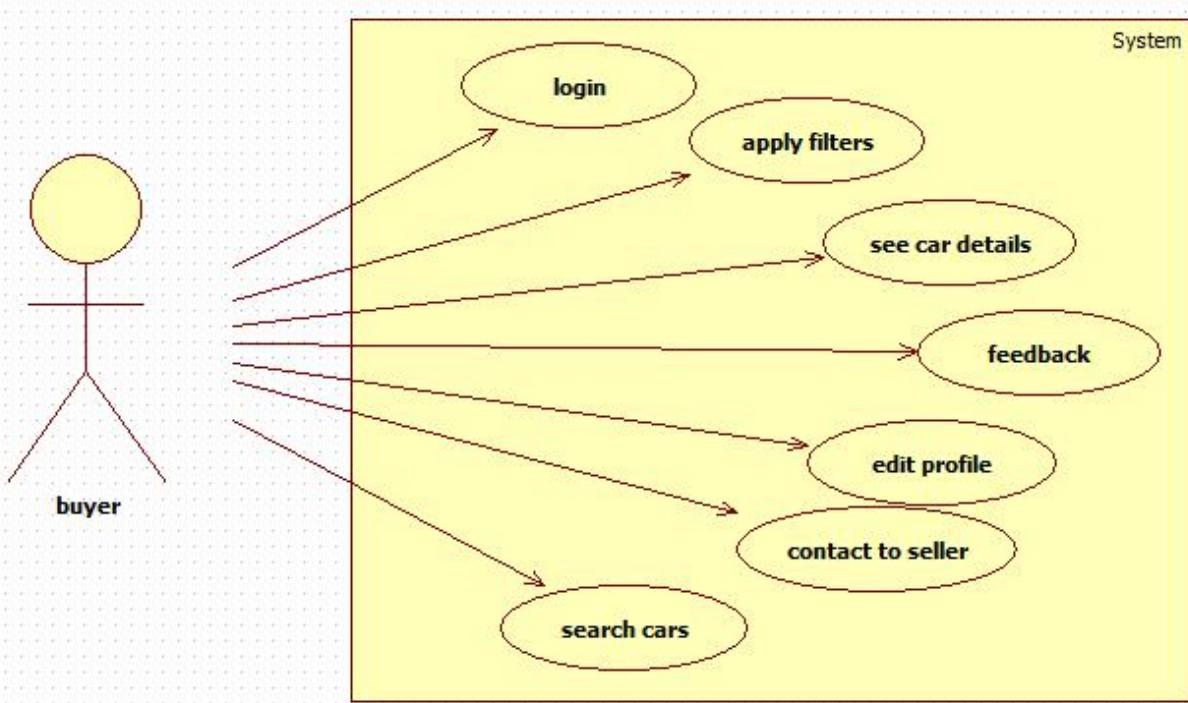


4.4.2 Login DFD:

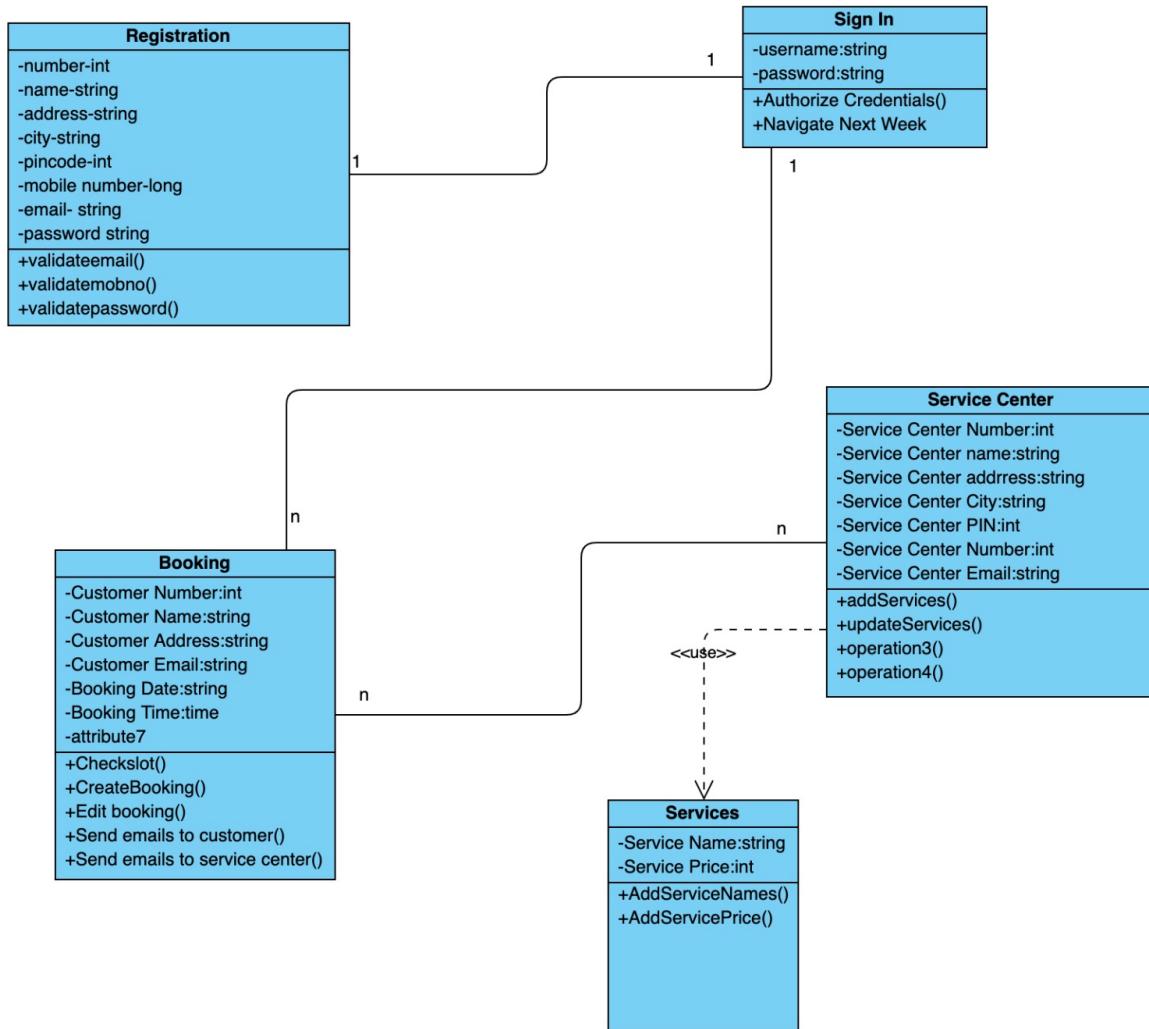


4.5 Use Case Diagram

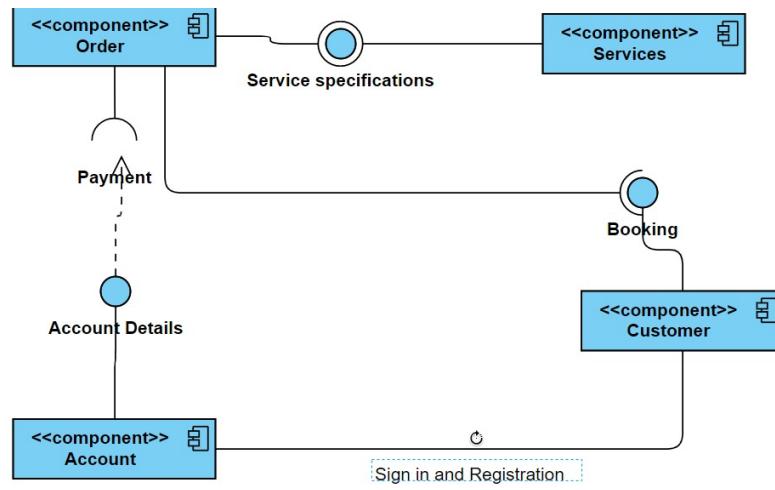
4.5.1 Buyer



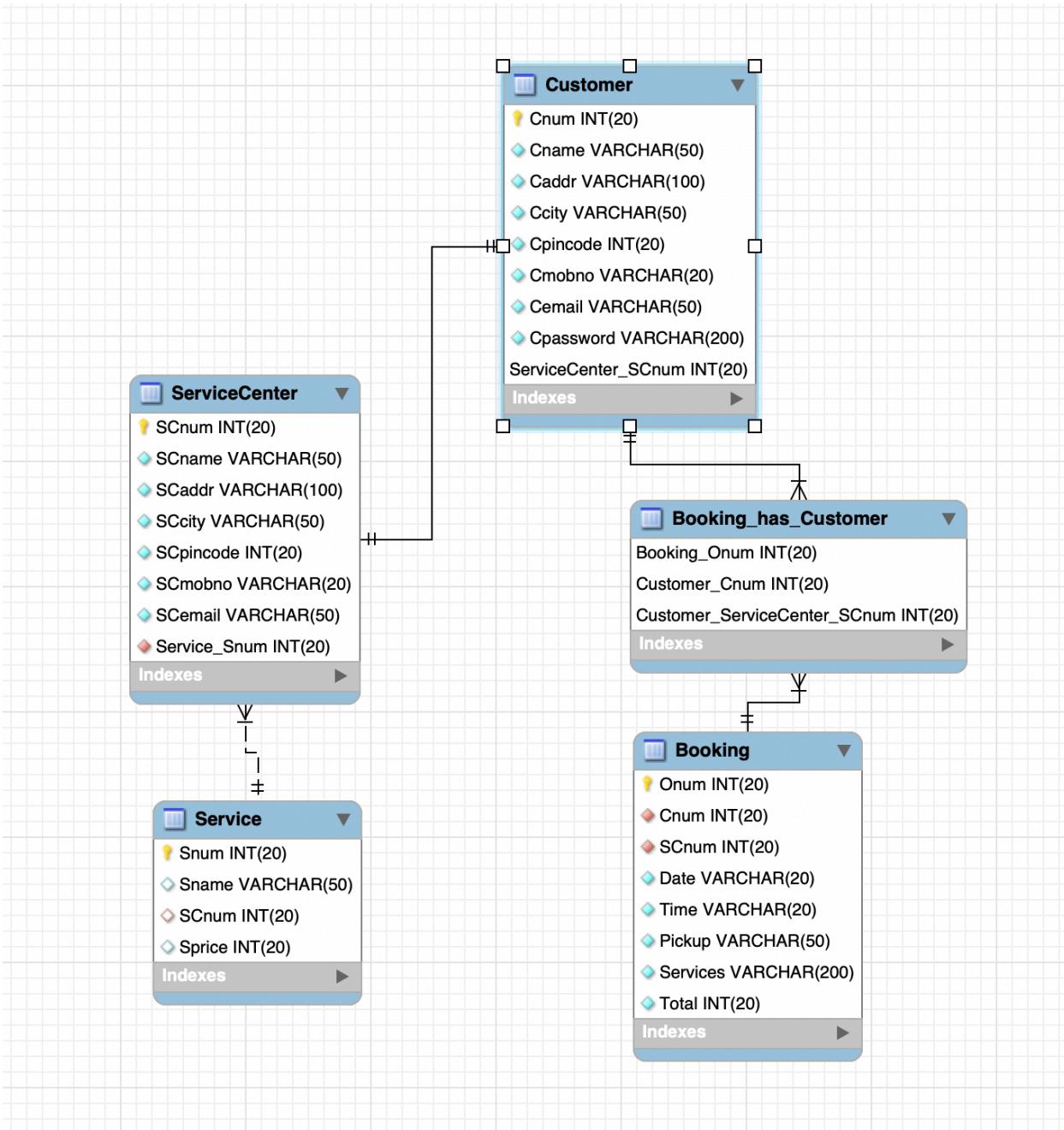
4.6 Class Diagram



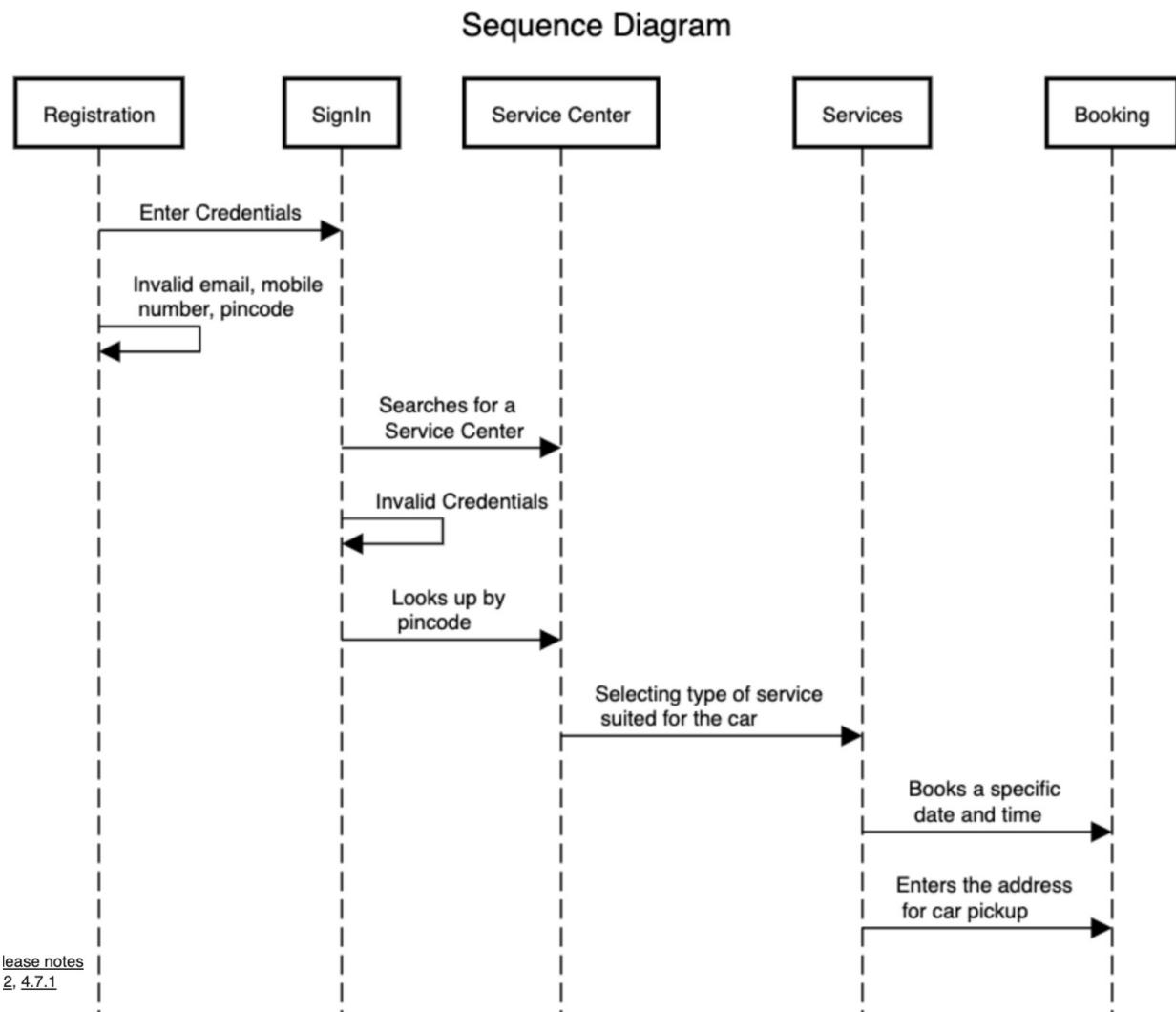
4.7 Component Diagram



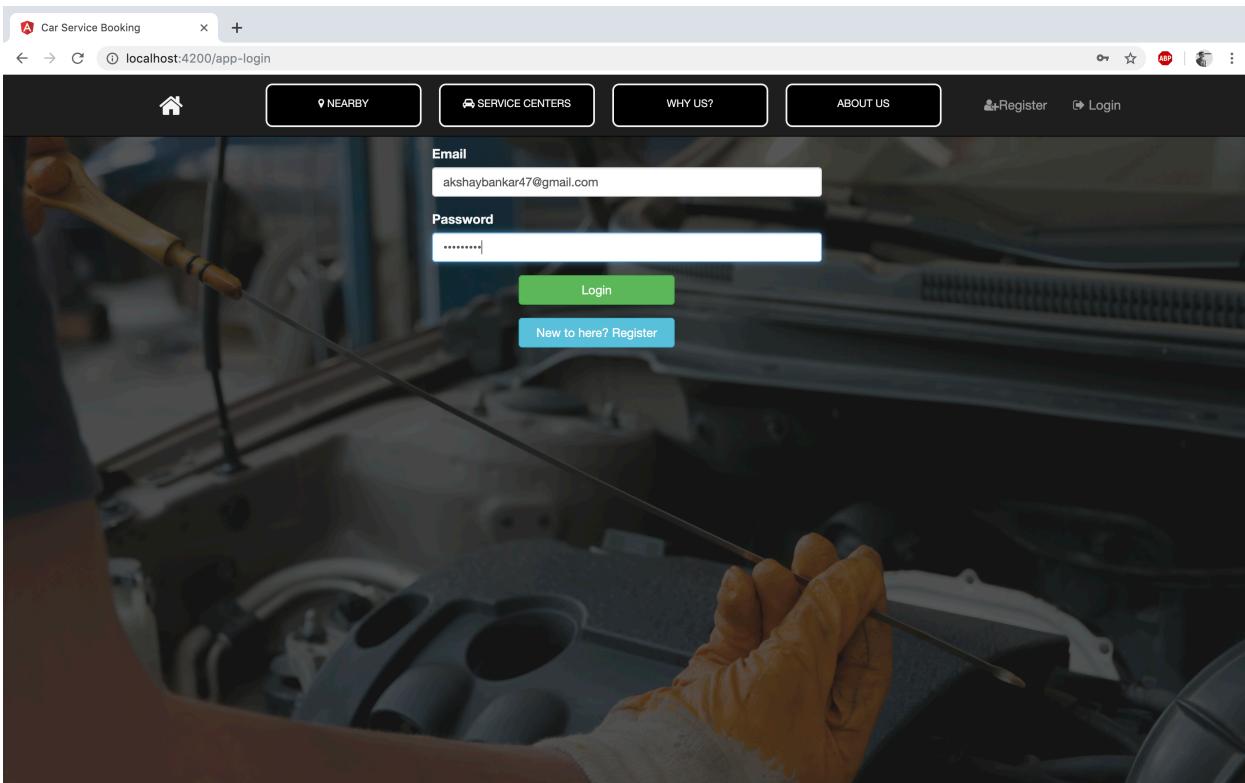
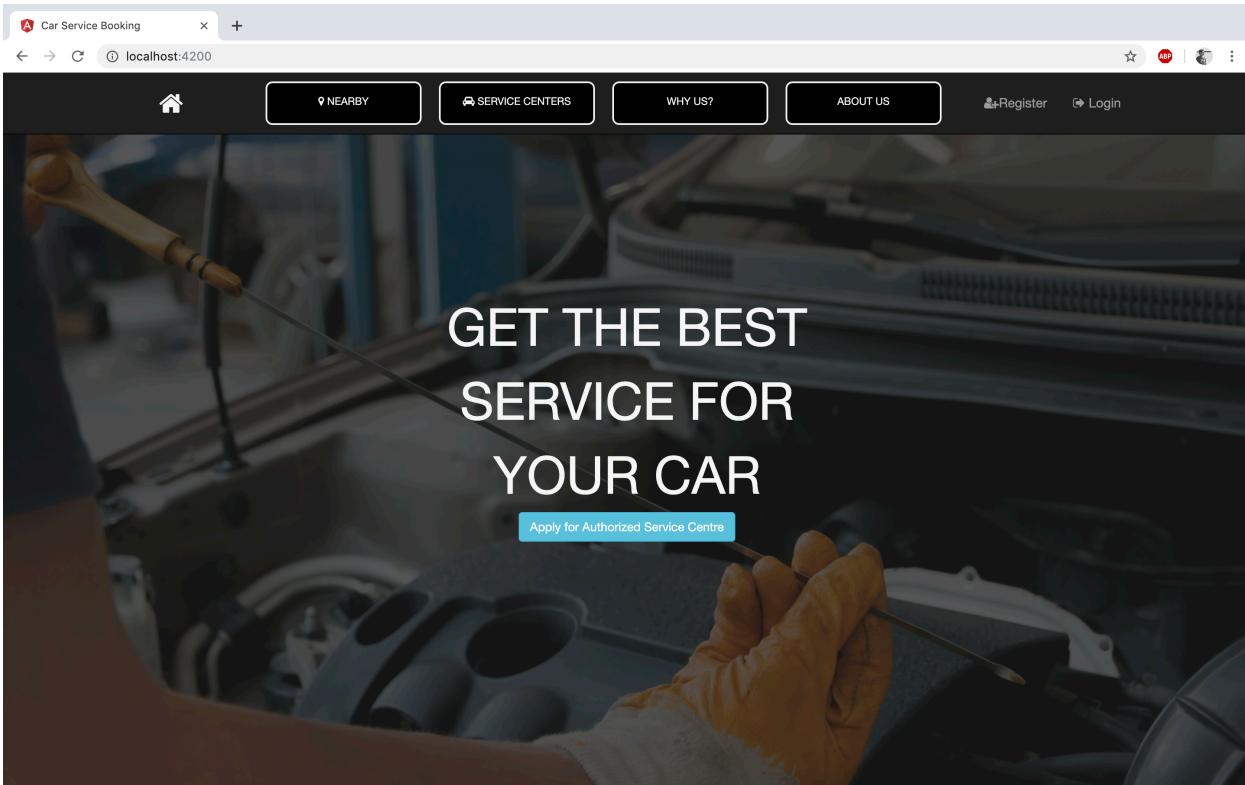
4.8 ER Diagram

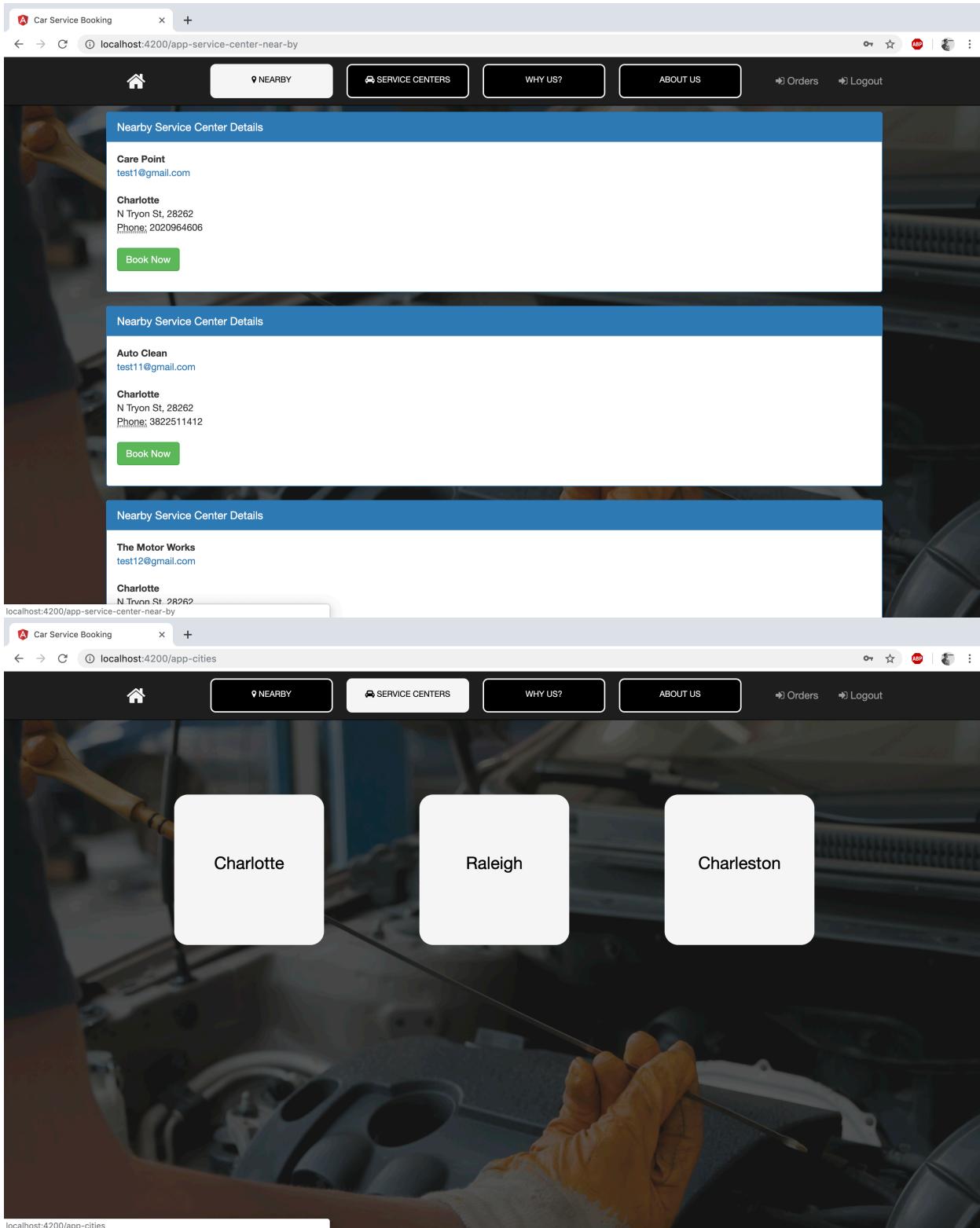


4.9 Sequence Diagram



5. Results





Nearby Service Center Details

Care Point
test1@gmail.com

Charlotte
N Tryon St, 28262
Phone: 2020964606

Book Now

Nearby Service Center Details

Auto Clean
test11@gmail.com

Charlotte
N Tryon St, 28262
Phone: 3822511412

Book Now

Nearby Service Center Details

The Motor Works
test12@gmail.com

Charlotte
N Tryon St, 28262

localhost:4200/app-service-center-near-by

Car Service Booking

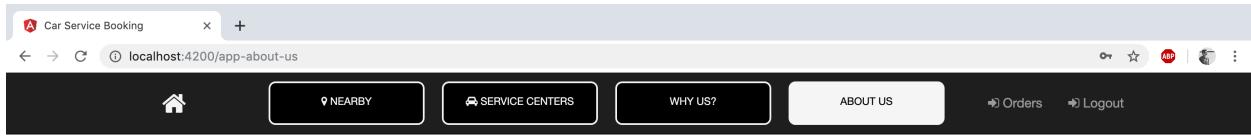
NEARBY SERVICE CENTERS WHY US? ABOUT US Orders Logout

Charlotte

Raleigh

Charleston

localhost:4200/app-cities

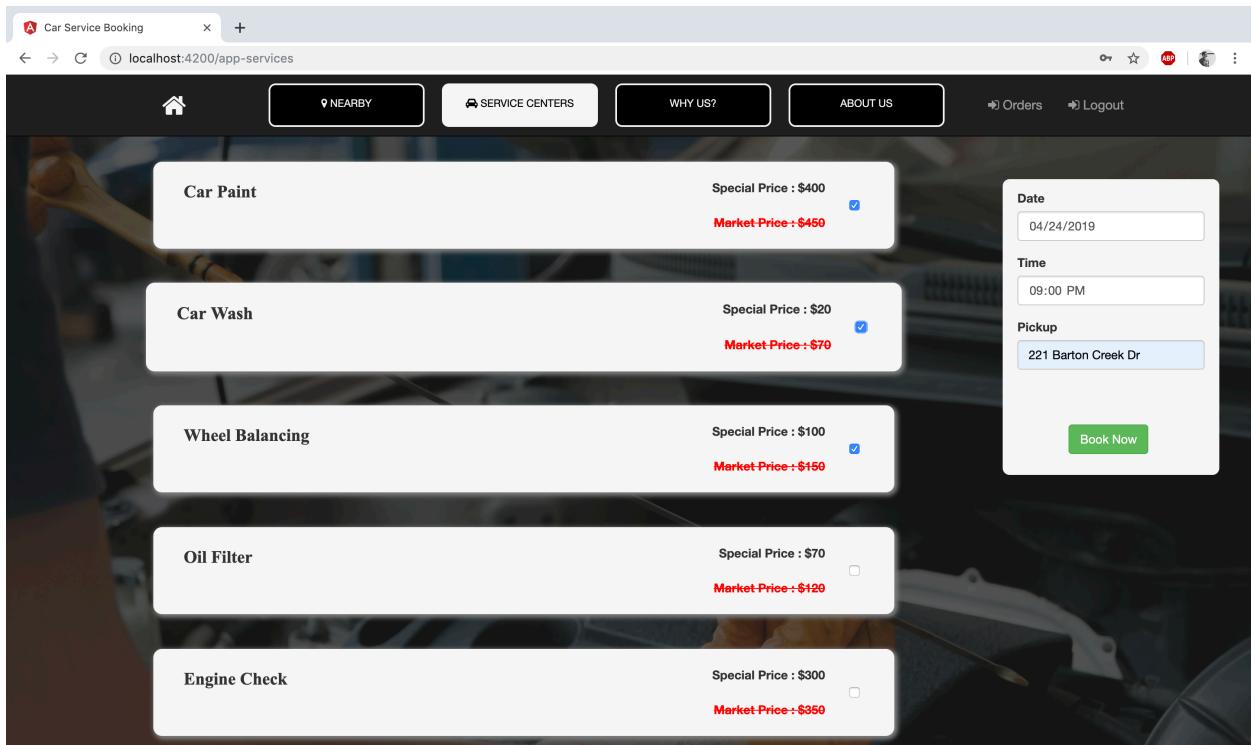


About Us

There are many variations of passages of Lorem Ipsum available, but the majority have suffered alteration in some form, by injected humour, or randomised words which don't look even slightly believable. If you are going to use a passage of Lorem Ipsum, you need to be sure there isn't anything embarrassing hidden in the middle of text. All the Lorem Ipsum generators on the Internet tend to repeat predefined chunks as necessary, making this the first true generator on the Internet. It uses a dictionary of over 200 Latin words, combined with a handful of model sentence structures, to generate Lorem Ipsum which looks reasonable. The generated Lorem Ipsum is therefore always free from repetition, injected humour, or non-characteristic words etc.

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Car Service Booking

localhost:4200/app-details

Home NEARBY SERVICE CENTERS WHY US? ABOUT US Orders Logout

Booking Details

Customer Details

Akshay
akshaybankar47@gmail.com

Charlotte
221 Barton Creek Dr, 28262
Phone: 9808339512

Order Details

Service Center Details :
Care Point
test1@gmail.com

Charlotte
N Tryon St, 28262
Phone: 2020964606

Services Booked
Car Paint, Car Wash, Wheel Balancing.

Total :\$520



7. Database Design

Local instance 3306

Administration Schemas Query 3

SCHEMAS
mean
Tables
Customer
Service
ServiceCenter
Views
Stored Procedures
Functions
sys

```
1 • USE mean;
2
3 • SELECT * FROM Customer;
```

Result Grid Filter Rows: Search Edit: Export/Import:

Cnum	Cname	Caddr	Ccity	Cpincode	Cmobno	Cemail	Cpassword
7	Akshay	221 Barton Creek Dr	Charlotte	28262	9808339512	akshaybankar47@gmail.com	8d809bec84b22a9090075e55fb01165704adce5...
8	Sai Santosh	216 Barton Creek Dr	Charlotte	28262	9802028148	vperumal@uncc.edu	ba146c63046d25af13fa7d9003bf3e92976231d...
9	Vinay Krishna	216 Barton Creek Dr	Charlotte	28262	9803199722	vmtutukun@uncc.edu	929ba795d547ff83fcfd59cbb0381c1b841db...
10	Grishma	Ashford Green Apts	Charlotte	28262	9195797839	gkalidin@uncc.edu	03ddee4a305add285d46365dc88f912de326ea...

Action Output

Time	Action	Response	Duration / Fetch Time
17:17:40	USE mean	0 row(s) affected	0.00024 sec
17:17:40	SELECT * FROM Customer LIMIT 0, 1000	4 row(s) returned	0.00043 sec / 0.000...
17:17:45	USE mean	0 row(s) affected	0.00015 sec
17:17:45	SELECT * FROM Customer LIMIT 0, 1000	4 row(s) returned	0.00028 sec / 0.000...

Object Info Session No object selected

Query Completed

Local instance 3306

Administration Schemas Query 3

SCHEMAS
mean
Tables
Booking
Customer
Service
ServiceCenter
Views
Stored Procedures
Functions
sys

```
1 • USE mean;
2
3 • SELECT * FROM Booking;
```

Result Grid Filter Rows: Search Edit: Export/Import:

Onum	Cnum	SCnum	Date	Time	Pickup	Services	Total
27	7	1	2019-04-30	13:00	Next day	Car Paint, Wheel Balancing, Engine Check,	800
28	7	6	2019-05-15	14:00	Same Day	AC Check, Car Wash, Wheel Alignment, Oil Filter,	220
29	7	1	2019-04-24	13:00	221 Barton Creek Dr	Car Paint, Car Wash, Wheel Balancing,	520
30	7	1	2019-04-23	13:00	221 Barton Creek Dr	Car Paint,	400
31	7	1	2019-04-24	13:01	221 Barton Creek Dr	Car Wash,	20
32	7	1	2019-04-24	21:00	221 Barton Creek Dr	Car Wash, Wheel Balancing,	120
33	7	1	2019-04-23	14:00	221 Barton Creek Dr	Car Paint, Car Wash,	420
34	7	1	2019-04-23	13:00	221 Barton Creek Dr	Car Paint, Wheel Balancing,	500
35	7	1	2019-04-24	21:00	221 Barton Creek Dr	Car Paint, Car Wash, Wheel Balancing,	520

Action Output

Time	Action	Response	Duration / Fetch Time
17:17:40	USE mean	0 row(s) affected	0.00024 sec
17:17:40	SELECT * FROM Customer LIMIT 0, 1000	4 row(s) returned	0.00043 sec / 0.000...
17:17:45	USE mean	0 row(s) affected	0.00015 sec
17:17:45	SELECT * FROM Customer LIMIT 0, 1000	4 row(s) returned	0.00028 sec / 0.000...
17:18:01	USE mean	0 row(s) affected	0.00017 sec
17:18:01	SELECT * FROM Booking LIMIT 0, 1000	9 row(s) returned	0.00028 sec / 0.000...

Object Info Session No object selected

Query Completed

Local instance 3306

Administration Schemas Query 3

SCHEMAS
mean
Tables
Booking
Customer
Service
ServiceCenter
Views
Stored Procedures
Functions
sys

```
1 • USE mean;
2
3 • SELECT * FROM Service;
```

Result Grid Filter Rows: Search Edit: Export/Import:

Snum	Sname	SCnum	Sprice
1	Car Paint	1	400
2	Car Wash	1	20
3	Wheel Balancing	1	100
4	Oil Filter	1	70
5	Engine Check	1	300
6	AC Check	2	100
7	Wheel Alignment	2	200
8	Car Wash	2	30
9	AC Check	3	100
10	Car Wash	3	25
11	Wheel Alignment	3	150
12	AC Check	4	50
13	Car Wash	4	15
14	Wheel Alignment	4	150
15	AC Check	5	90
16	Car Wash	5	10
17	Wheel Alignment	5	50
18	AC Check	6	20
19	Car Wash	6	10
20	Wheel Alignment	6	90
21	AC Check	7	20
22	Car Wash	7	30

Customer 2 Service 6

Action Output

Time	Action	Response	Duration / Fetch Time
17:17:40	USE mean	0 row(s) affected	0.00024 sec
17:17:40	SELECT * FROM Customer LIMIT 0, 1000	4 row(s) returned	0.00043 sec / 0.000...
17:17:45	USE mean	0 row(s) affected	0.00015 sec
17:17:45	SELECT * FROM Customer LIMIT 0, 1000	4 row(s) returned	0.00028 sec / 0.000...
17:18:01	USE mean	0 row(s) affected	0.00017 sec
17:18:01	SELECT * FROM Booking LIMIT 0, 1000	9 row(s) returned	0.00028 sec / 0.000...
17:18:23	SELECT * FROM Service LIMIT 0, 1000	63 row(s) returned	0.00026 sec / 0.000...

Query Completed

Local instance 3306

Administration Schemas Query 3

SCHEMAS
mean
Tables
Booking
Customer
Service
ServiceCenter
Views
Stored Procedures
Functions
sys

```
1 • USE mean;
2
3 • SELECT * FROM ServiceCenter;
```

Result Grid Filter Rows: Search Edit: Export/Import:

SCnum	SName	SCaddr	SCcity	SCpincode	SCmobno	SCemail
1	Car Point	N Tryon St	Charlotte	28282	2020964606	test1@gmail.com
2	Auto Clean	N Tryon St	Charlotte	28282	3822511412	test11@gmail.com
3	The Motor Works	N Tryon St	Charlotte	28282	5588071021	test12@gmail.com
4	Car Hub Station	University City Blvd	Charlotte	28213	4898986569	test2@gmail.com
5	Auto Zone	Concord	Charlotte	28027	4898986567	test3@gmail.com
6	Glaze Motors	Baileywick Rd	Raleigh	28223	4898986547	test4@gmail.com
7	Patinum Cars	Baileywick Rd	Raleigh	28223	589886545	test5@gmail.com
8	Cars Hub	Glenwood	Raleigh	27560	289886578	test6@gmail.com
9	Car Point	University Dr	Durham	12345	302098697	test7@gmail.com
10	Car Hub	Dixon Rd	Durham	24311	5020986979	test8@gmail.com
11	Auto Clean	Massey Chapel Rd	Durham	22222	6020987979	test9@gmail.com
12	NTB	N Tryon St	Charlotte	28282	9822454454	test13@gmail.com
13	My Service Centre	N Tryon St	Charlotte	28282	9808339512	myservicecenter@...
16	Tuffy Tire and Au...	Folly Rd	Charleston	29412	1234567890	test14@gmail.com
28	Dummy Values	Dummy Rd	Charleston	12345	4908357075	test10@gmail.com

Customer 2 ServiceCenter 7

Action Output

Time	Action	Response	Duration / Fetch Time
17:17:40	SELECT * FROM Customer LIMIT 0, 1000	4 row(s) returned	0.00043 sec / 0.000...
17:17:45	USE mean	0 row(s) affected	0.00015 sec
17:17:45	SELECT * FROM Customer LIMIT 0, 1000	4 row(s) returned	0.00028 sec / 0.000...
17:18:01	USE mean	0 row(s) affected	0.00017 sec
17:18:01	SELECT * FROM Booking LIMIT 0, 1000	9 row(s) returned	0.00028 sec / 0.000...
17:18:23	SELECT * FROM Service LIMIT 0, 1000	63 row(s) returned	0.00026 sec / 0.000...
17:18:42	SELECT * FROM ServiceCenter LIMIT 0, 1000	15 row(s) returned	0.00028 sec / 0.000...

Query Completed

Local instance 3306

Administration Schemas Query 3

SCHEMAS

mean

Tables

Booking

Customer

Service

ServiceCenter

Views

Stored Procedures

Functions

sys

1 • USE mean;

2

3 • SELECT * FROM Service;

100% 23:3

Result Grid Filter Rows: Search Edit: Export/Import:

Snum	Sname	SCnum	Sprice
1	Car Wash	1	100
2	AC Check	1	70
3	Wheel Balancing	1	100
4	Oil Filter	1	70
5	Engine Check	1	300
6	AC Check	2	100
7	Wheel Alignment	2	200
8	Car Wash	2	30
9	AC Check	3	100
10	Car Wash	3	25
11	Wheel Alignment	3	150
12	AC Check	4	50
13	Car Wash	4	15
14	Wheel Alignment	4	150
15	AC Check	5	90
16	Car Wash	5	10
17	Wheel Alignment	5	50
18	AC Check	6	20
19	Car Wash	6	10
20	Wheel Alignment	6	90
21	AC Check	7	20
22	Car Wash	7	30
23	Wheel Alignment	7	120
			...

Object Info Session

Customer: 2 Service: 8

Apply Revert

Table: Service

Columns:

Snum	int(20) AI PK
Sname	varchar(50)
SCnum	int(20)
Sprice	int(20)

Action Output

Time	Action	Response	Duration / Fetch Time
17:17:45	USE mean	0 row(s) affected	0.00015 sec
17:17:45	SELECT * FROM Customer LIMIT 0, 1000	4 row(s) returned	0.00028 sec / 0.000...
17:18:01	USE mean	0 row(s) affected	0.00017 sec
17:18:01	SELECT * FROM Booking LIMIT 0, 1000	9 row(s) returned	0.00028 sec / 0.000...
17:18:23	SELECT * FROM Service LIMIT 0, 1000	63 row(s) returned	0.00026 sec / 0.000...
17:18:42	SELECT * FROM ServiceCenter LIMIT 0, 1000	15 row(s) returned	0.00028 sec / 0.000...
17:21:06	SELECT * FROM Service LIMIT 0, 1000	63 row(s) returned	0.00039 sec / 0.000...

Query Completed

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Result Grid Form Editor Field Types Query Stats Execution Plan

8. Conclusion

The user can register for free to use this reservation system. The login system enable user to update the current profile. Users are able to select their preferred time and date for their services. In conjunction, user able to select the pick-up and delivery service if there are interested and there are few monthly promotions can be selected. At the end of reservation, users are able to check out by selecting the payment methods.

The web server will update at the back office and the management will get the updates of the particular reservation.

8. References

1. Highsmith, Jim, and Alistair Cockburn. "Agile software development: The business of innovation." *Computer* 34, no. 9 (2001): 120-127.
2. Cockburn, Alistair, and Jim Highsmith. "Agile software development: The people factor." *Computer* 11 (2001): 131-133.
3. Mahnic, Viljan. "A capstone course on agile software development using Scrum." *IEEE Transactions on Education* 55, no. 1 (2012): 99-106.
4. Sterling, Aaron. "NodeJS and Angular Tools for JSON-LD." In *2019 IEEE 13th International Conference on Semantic Computing (ICSC)*, pp. 392-395. IEEE, 2019.
5. *NodeJS* - <https://nodejs.org/en/docs/>
6. *Angular* - <https://angular.io/docs>