



CSE302: Database Systems (Section 7) [Fall-2024]

Project Report

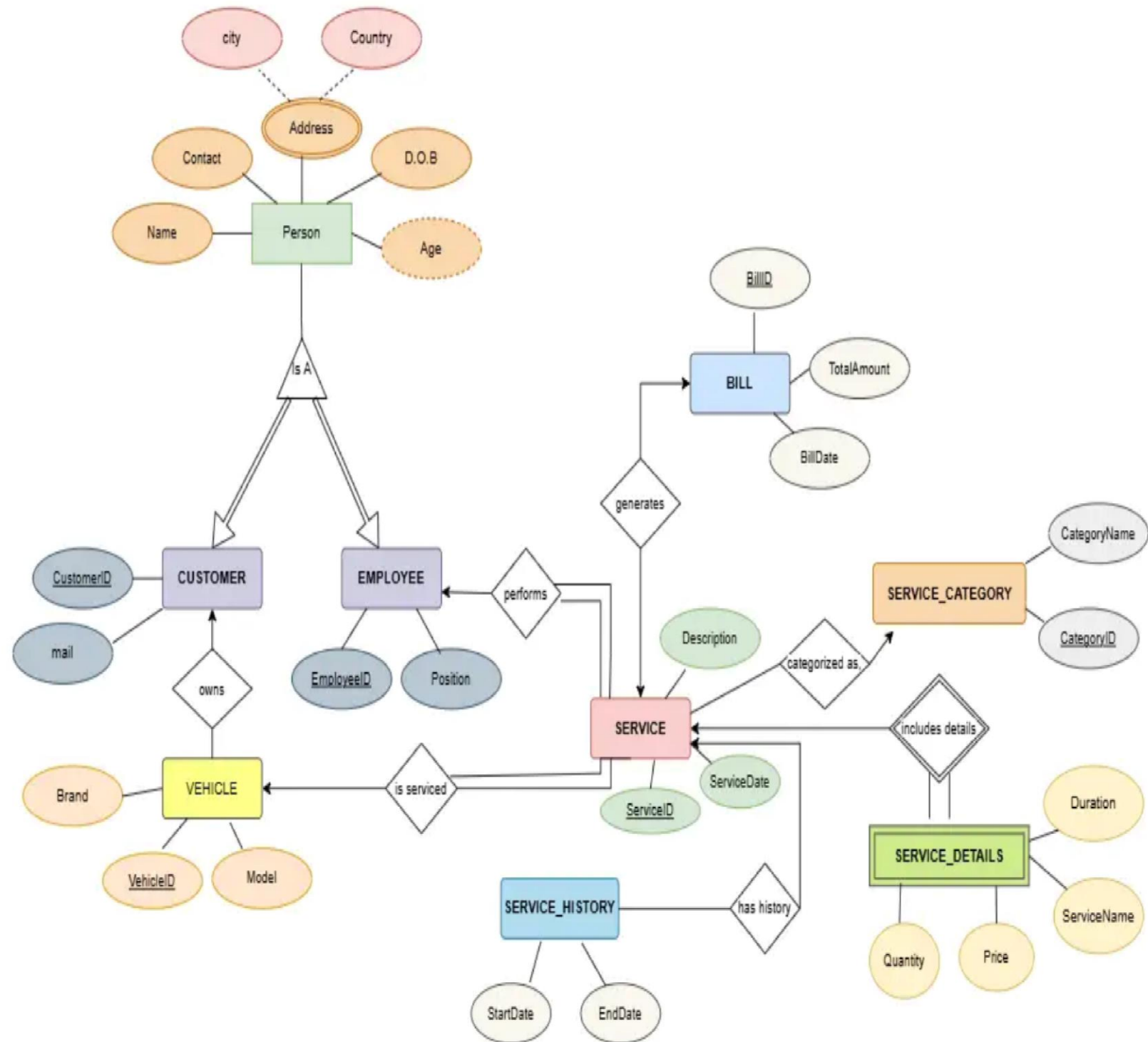
Vehicle Service Management System

<https://apex.oracle.com/pls/apex/r/provapurva/gearguard/login?session=104351580107536>

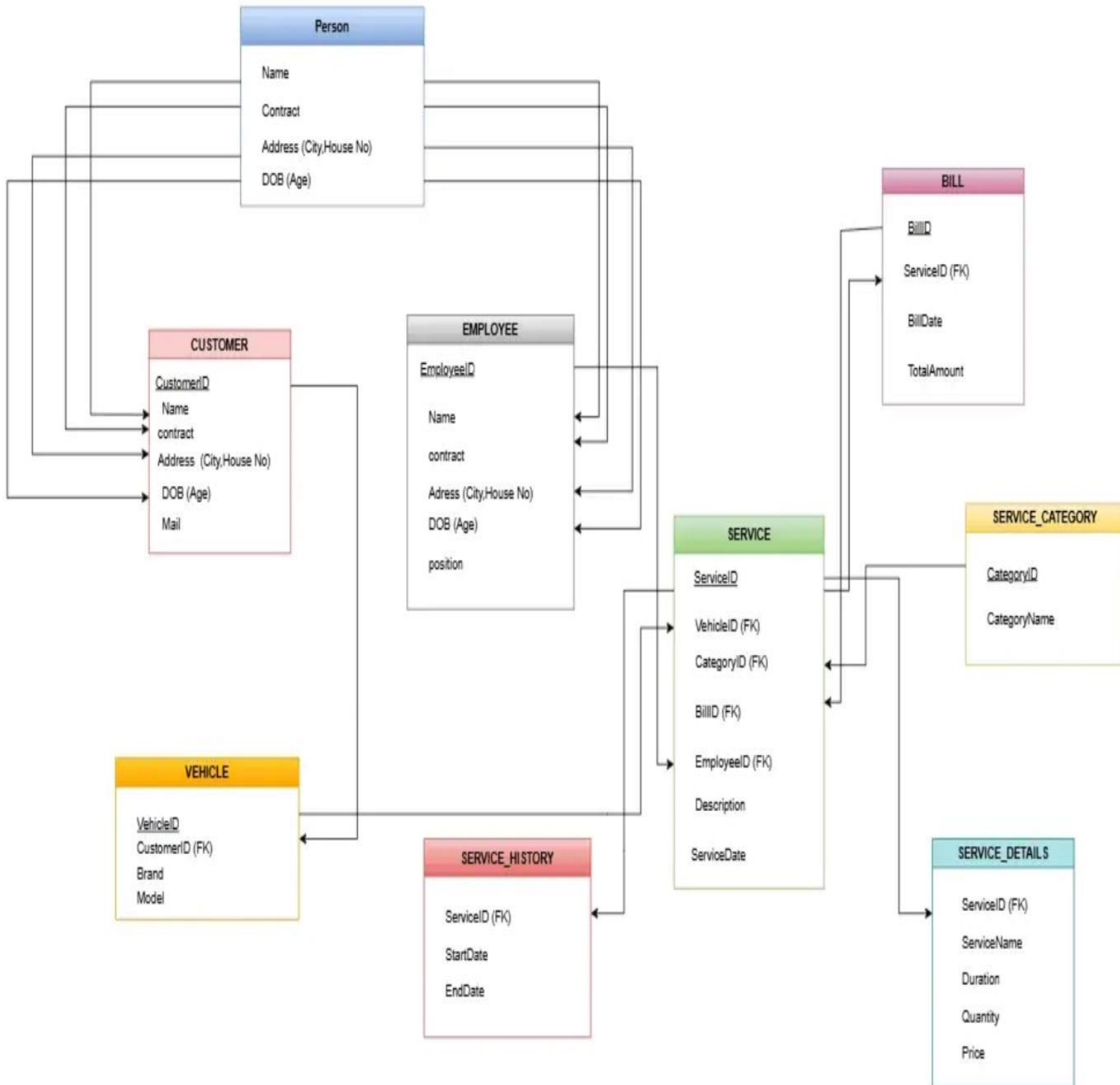
Submitted by:

Student ID	Student Name	Contribution Percentage
2023-1-60-075	Nuran Farhana Prova	35%
2023-1-60-073	Afsana Akhter Mim	35%
2023-1-60-202	Farhatun Nahar Priya	20%
2022-3-60-127	Sumaiya Binte Shahin	10%

E-R Model of the Project



Schema Design of the Project





Implementation Checklist

Description	Remarks
Project ID	47705
Workspace Name	ProVApurva
Workspace Email	provanuren@gmail.com
Workspace Password	12345678
Authentication Type	Custom
Username and Password to Login	
if you have multiple users, write all username and password correctly	Username: loser, Password:error404 Username: labib, Password: labib1234
Number of Reports with Forms	10
Number of Reports based on Queries, Aggregate Queries	10
Extra features	In our project, we use HTML forms for user interface design. The unique user ID is generated automatically through backend logic and displayed dynamically on the HTML form. This ensures that every new user is assigned a unique ID seamlessly during the creation process.
Unique functionality	There are lots of unique functionality in our app. We use authorization, custom authentication, nested subqueries and many things.

Reports with Forms

Report Page Number and Name	Form Page Number and Name	Table
11-Person	2-Person	Person
13-Employee	3-Employee	Employee
12-Customer	4-Customer	Customer
14-Vehicle	5-Vehicle	Vehicle
15-Service	6-Service	Service
16-service_category	7-service_category	Service_category
17-Service_details	8-Service_details	Service_details
18-Servic_history	9-Service_history	Service_history
19-Bill	10-Bill	Bill

 GearGuard



Home \

Person

Person

Name

Contact

Address

Dob

Age

City

Country

Cancel

Create

Figure: 4.1

Person

Q

Go

Actions

Name	Contact	Address	Dob	Age	City	Country
Asif Mahmud	01710000007	Rangpur, Bangladesh	6/18/1998	26	Rangpur	Bangladesh
Mahbub Alam	01710000011	Narayanganj, Bangladesh	5/6/1987	37	Narayanganj	Bangladesh
Nafisa Tabassum	01710000018	Brahmanbaria, Bangladesh	7/30/2001	23	Brahmanbaria	Bangladesh
Sumaiya Islam	01710000020	Feni, Bangladesh	2/10/1966	38	Feni	Bangladesh
Anika Hasan	01710000002	Chittagong, Bangladesh	7/25/1990	34	Chittagong	Bangladesh
Farhana Rahman	01710000008	Mymensingh, Bangladesh	2/28/1993	31	Mymensingh, Bangladesh	Bangladesh
Nusrat Jahan	01710000006	Barisal, Bangladesh	12/30/2000	24	Barisal	Bangladesh
Rahim Uddin	01710000001	Dhaka, Bangladesh	3/10/1985	39	Dhaka	Bangladesh
Rafiq Islam	01710000005	Rajshahi, Bangladesh	4/5/1988	36	Rajshahi	Bangladesh
Sharmin Akter	01710000016	Manikganj, Bangladesh	4/19/1989	35	Manikganj	Bangladesh
Wasimul Bari Rahat	01792547928	East West University	1/1/2010	15	Dhaka	Bangladesh
Arifa Sultana	01710000014	Bogura, Bangladesh	11/11/1991	33	Bogura	Bangladesh
Karim Ali	01710000003	Sylhet, Bangladesh	1/14/1975	50	Sylhet	Bangladesh
Sanjida Khatun	01710000012	Jashore, Bangladesh	3/15/1996	28	Jashore	Bangladesh
Ayesha Siddiqua	01710000010	Cumilla, Bangladesh	10/10/1999	25	Cumilla	Bangladesh
Tanvir Chowdhury	01710000019	Kishoreganj, Kishoregan	9/15/1992	32	Kishoreganj	Kishoregan
Sayed Hassan	01710000017	Noakhali, Bangladesh	6/23/1994	30	Noakhali	Bangladesh
Habib Rahman	01710000013	Pabna, Bangladesh	8/8/1983	41	Pabna	Bangladesh

Figure: 4.1

Home \

Employee

Employee

EmployeeID

Position

Name

Contract

Address

Dob

City

Country

Age

Cancel

Create

Figure: 4.2

Employee

Go

Actions

Position	Name	Contract	Address	Dob	City	Country	Age
Administrative Assistant	Sumaiya Islam	01710000020	Feni, Bangladesh	2/10/1986	Feni	Bangladesh	38
Manager	Rahim Uddin	01710000001	Dhaka, Bangladesh	3/10/1985	Dhaka	Bangladesh	39
Assistant Manager	Anika Hasan	01710000002	Chittagong, Bangladesh	7/25/1990	Chittagong	Bangladesh	34
Data Analyst	Sayed Hassan	01710000017	Noakhali, Bangladesh	6/23/1994	Noakhali	Bangladesh	30
Senior Officer	Karim Ali	01710000003	Sylhet, Bangladesh	1/14/1975	Sylhet	Bangladesh	50
Officer	Tasnim Akhter	01710000004	Khuina, Bangladesh	11/20/1995	Khuina	Bangladesh	29
Operations Manage	Tanvir Chowdhury	01710000019	Kishoreganj, Bangladesh	9/15/1992	Kishoreganj	Bangladesh	32
Team Leader	Rafiq Islam	01710000005	Rajshahi, Bangladesh	4/5/1988	Rajshahi	Bangladesh	36
Business Analyst	Shamim Alder	01710000016	Manikganj, Bangladesh	4/19/1989	Manikganj	Bangladesh	35
Sales Executive	Nafisa Tabassum	01710000018	Brahmanbaria, Bangladesh	7/30/2001	Brahmanbaria	Bangladesh	23

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1 - 10

Figure: 4.2

Home \

Customer

Customer

CustomerID

Mail

Name

Contract

Address

Dob

Age

City

Country

Cancel

Create

Figure: 4.3

Customer

Q

Go

Actions

Mail	Name	Contract	Address	Dob	Age	City	Country
arif.sultana@mail.com	Arifa Sultana	01710000014	Bogura, Bangladesh	11/11/1991	33	Bogura	Bangladesh
rakib.hossain@mail.com	Rakib Hossain	01710000015	Tangail, Bangladesh	1/22/1997	27	Tangail	Bangladesh
rahim.uddin@mail.com	Rahim Uddin	01710000001	Dhaka, Bangladesh	3/10/1985	39	Dhaka	Bangladesh
tasnim.akhter@mail.com	Tasnim Akhter	01710000004	Khuina, Bangladesh	11/20/1995	29	Khuina	Bangladesh
serjida.khatun@mail.com	Serjida Khatun	01710000012	Jashore, Bangladesh	3/15/1996	28	Jashore	Bangladesh
habib.rahman@mail.com	Habib Rahman	01710000013	Pabna, Bangladesh	8/6/1983	41	Pabna	Bangladesh
anika.hasan@mail.com	Anika Hasan	01710000002	Chittagong, Bangladesh	7/25/1990	34	Chittagong	Bangladesh
karim.ali@mail.com	Karim Ali	01710000003	Sylhet, Bangladesh	1/14/1975	50	Sylhet	Bangladesh
mahbub.alam@mail.com	Mahbub Alam	01710000011	Narayanganj, Bangladesh	5/6/1987	37	Narayanganj	Bangladesh
rafiq.islam@mail.com	Rafiq Islam	01710000005	Rajshahi, Bangladesh	4/5/1988	36	Rajshahi	Bangladesh

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1 - 10

Figure: 4.3

Home \

Vehicle

Vehicle

VEHICLEID

Customerid

Brand

Model

Cancel

Create

Figure: 4.4

Vehicle

Q	Go	Actions
Customerid	Brand	Model
CUST-10001	Toyota	Corolla
CUST-10008	Nissan	Altima
CUST-10006	Nissan	X-Trail
CUST-10009	Toyota	RAV4
CUST-10002	Civic	Honda
CUST-10005	Mazda	CX-5
CUST-10007	Hyundai	Elantra
CUST-10003	Honda	Accord
CUST-10004	Toyota	Camry
CUST-10010	Hyunda	Tucson

1 - 10

Figure: 4.4

Home \

Service

Service

SERVICEID

Vehicleid

Description

Servicedate

Billid

Employeeid

Categoryid

Cancel

Create

Figure: 4.5

Service					
<div> <input type="text"/> <input type="button" value="Go"/> <input type="button" value="Actions"/> </div>					
Vehicleid	Description	Servicedate	Billid	Employeeid	Categoryid
VEH-10001	Oil change	1/1/2025	B-101	EMP-2001	CAT-3001
VEH-10006	Wheel alignment	6/25/2025	B-106	EMP-2006	CAT-3006
VEH-10005	Battery check	4/18/2025	B-105	EMP-2005	CAT-3005
VEH-10007	Air filter change	3/9/2025	B-107	EMP-2007	CAT-3007
VEH-10004	Engine tuning	5/3/2025	B-104	EMP-2004	CAT-3004
VEH-10010	AC servicing	9/12/2025	B-110	EMP-2010	CAT-3010
VEH-10002	Tire replacement	3/22/2025	B-102	EMP-2002	CAT-3002
VEH-10003	Brake inspection	1/11/2025	B-103	EMP-2003	CAT-3003
VEH-10008	Coolant flush	7/14/2025	B-108	EMP-2008	CAT-3008
1 - 9					

Figure: 4.5

Service_Category

Service_Category

Figure: 4.6

Service_category

<div> <input type="text"/> <input type="button" value="Go"/> <input type="button" value="Actions"/> </div>	
Categoryid	Categoryname
CAT-3001	Sedan
CAT-3002	SUV
CAT-3006	Minivan
CAT-3005	Convertible
CAT-3009	Sports Car
CAT-3008	Wagon
CAT-3007	Pickup Truck
CAT-3004	Coupe
CAT-3003	Hatchback
CAT-3010	Electric Vehicle (EV)
1 - 10	

Figure: 4.6

Service_details

Service_details

Figure: 4.7

Service_details

Serviceid	Duration	Servicename	Quantity	Price
SVC-00004	1.5 hours	Engine Tuning	1	250
SVC-00010	1 hour	AC Servicing 1 170.00	3	170
SVC-00008	1 hour	Coolant Flush	3	120
SVC-00005	30 mins	Battery Check	1	40
SVC-00001	30 mins	Oil Change	1	50
SVC-00006	1 hour	Wheel Alignment	1	150
SVC-00007	20 mins	Air Filter Change	2	30
SVC-00003	45 mins	Brake Inspection	2	100
SVC-00002	1 hour	Tire Replacement	4	200
SVC-00009	2 hours	Suspension Check	1	300

1 - 10

Figure: 4.7

Service_History

Service_History

Figure: 4.8

Service_history

Serviceid	Startdate	Enddate
SVC-00004	5/3/2025	5/5/2025
SVC-00009	8/20/2025	8/22/2025
SVC-00005	4/18/2025	4/20/2025
SVC-00001	2/15/2025	2/17/2025
SVC-00006	6/25/2025	6/27/2025
SVC-00008	7/14/2025	7/16/2025
SVC-00010	9/12/2025	9/14/2025
SVC-00007	3/9/2025	3/10/2025
SVC-00003	1/11/2025	1/13/2025
SVC-00002	3/22/2025	3/24/2025

Figure: 4.8

Bill

Serviceid
Totalamount
Billdate
Cancel
Create

Figure: 4.9

Bill

Serviceid	Totalamount	Billdate
SVC-00002	200	3/22/2025
SVC-00007	90	3/9/2025
SVC-00006	180	6/25/2025
SVC-00001	150	2/15/2025
SVC-00005	120	4/18/2025
SVC-00010	170	9/12/2025
SVC-00008	220	7/14/2025
SVC-00009	300	8/20/2025
SVC-00003	100	1/11/2025
SVC-00004	250	5/3/2025

Figure: 4.9

USER_REPORT				
Q	Go	Actions	Create	
	User Name	User Pass	User Roll	User Activated
	prova	prova1234	admin	1
	asif	asif1234	viewer	1
	mim	mim1234	admin	1
	priya	priya1234	admin	1
	labib	labib1234	viewer	0
	rawnak	rawnak1234	viewer	1
	loser	error404	admin	1
	sumaiya	sumaiya1234	editor	1
1 - 8				

Reports based on Multi-Table and Aggregate Queries

Page Number and Name	Query Type	Report description
20- CUSTOMER_EMPLOYEE_OVERLAP	View Creation with Join Condition	The query creates a view to identify overlapping records between CUSTOMER and EMPLOYEE tables based on matching Name, Address, and DOB.
21- CUSTOMER_OWNED_VEHICLES	View Creation with LEFT JOIN	The query creates a view to list customers and their owned vehicles, including customers without associated vehicles, by performing a LEFT JOIN on the CUSTOMER and VEHICLE tables based on CustomerID.
22- INACTIVE_CUSTOMERS	View Creation with LEFT JOIN and Filtering	The query creates a view to list customers who have no associated vehicle services by performing LEFT JOINS between the CUSTOMER, VEHICLE, and SERVICE tables, and filtering out customers with active services
24- CITYWISE_CUSTOMER_DISTRIBUTION	View Creation with Grouping and Aggregation	The query creates a view to display the total number of customers in each city by grouping the CUSTOMER table by City and counting the number of CustomerIDs per city.
25- SERVICE_BILL_SUMMARY	View Creation with LEFT JOIN	The query creates a view to display service details along with corresponding billing information by performing a LEFT JOIN between the SERVICE and BILL tables based on ServiceID.

26- WITHINDATESERVICE	View Creation with JOIN and Date Filtering	The query creates a view to display service details with history, filtered for services with an EndDate between '01/01/2025' and '05/10/2025'.
28- CUSTOMER_AGE_DEMO GRAPHICS	View Creation with Conditional Grouping	The query creates a view to categorize customers into age ranges and count the total customers in each range using a CASE statement for grouping.
30- RECENT_BILLS	View Creation with Date Filtering and Ordering	The query creates a view to display bills from the last 30 days, ordered by BillDate in descending order.
23- EMPLOYEE_NOT_CU STOMER	View Creation with Subquery (NOT EXISTS)	The query creates a view to list employees who are not customers by using a NOT EXISTS subquery to check for non-matching records in the CUSTOMER table.
27- VEHICLEREVENUE	View Creation with JOIN, Aggregation, and Ordering	The query creates a view to calculate and display total revenue for each vehicle brand and model, ordered by revenue in descending order.

CUSTOMER_EMPLOYEE_OVERLAP				
Q ▾	Go	Actions ▾		
CustomerId	Customername	Employeeid	Employeename	Position
CUST-10001	Rahim Uddin	BMP-10001	Rahim Uddin	Manager
CUST-10002	Anika Hasan	BMP-10002	Anika Hasan	Assistant Manager
CUST-10004	Tasnim Akhter	BMP-10004	Tasnim Akhter	Officer
CUST-10005	Rafiq Islam	BMP-10005	Rafiq Islam	Team Leader

1 - 4

Figure: 6.1

CUSTOMER_OWNED_VEHICLES

Customerid	Customername	Vehiclebrand	Vehiclemodel
CUST-10001	Rahim Uddin	Toyota	Corolla
CUST-10006	Mahbub Alam	Nissan	X-Trail
CUST-10009	Arif Sultana	Toyota	RAV4
CUST-10002	Anika Hasan	Civic	Honda
CUST-10005	Rafiq Islam	Mazda	CX-5
CUST-10007	Sanjida Khatun	Hyundai	Elantra
CUST-10003	Karim Ali	Honda	Accord
CUST-10004	Tasnim Akhter	Toyota	Camry
CUST-10010	Rakib Hossain		
CUST-10008	Habib Rahman		

1 - 10

Figure: 6.2

INACTIVE_CUSTOMERS

Customerid	Customername	Mail
CUST-10009	Arifa Sultana	arifa.sultana@mail.com
CUST-10010	Rakib Hossain	rakib.hossain@mail.com
CUST-10008	Habib Rahman	habib.rahman@mail.com
CUST-10006	Mahbub Alam	mahbub.alam@mail.com

1 - 4

Figure: 6.3

CITYWISE_CUSTOMER_DISTRIBUTION

City	Totalcustomers
Tangail	1
Jashore	1
Sylhet	1
Pabna	1
Chittagong	1
Narayanganj	1
Bogura	1
Dhaka	1
Khulna	1
Rajshahi	1

1 - 10

Figure: 6.4

SERVICE_BILL_SUMMARY

Serviceid	Servicedescription	Billid	Totalamount	Billdate
SVC-00002	Tire replacement	B-102	200	3/22/2025
SVC-00006	Wheel alignment	B-106	180	6/25/2025
SVC-00001	Oil change	B-101	150	2/15/2025
SVC-00005	Battery check	B-105	120	4/18/2025
SVC-00010	AC servicing	B-110	170	9/12/2025
SVC-00003	Brake inspection	B-103	100	1/11/2025
SVC-00004	Engine tuning	B-104	250	5/3/2025
SVC-00008	Coolant flush			
SVC-00007	Air filter change			

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Figure: 6.5

WITHINDATESERVICE			
Q	Go	Actions	
Serviceid	Description	Startdate	Enddate
SVC-00001	Oil change	2/15/2025	2/17/2025
SVC-00005	Battery check	4/18/2025	4/20/2025
SVC-00007	Air filter change	3/8/2025	3/10/2025
SVC-00004	Engine tuning	5/3/2025	5/5/2025
SVC-00002	Tire replacement	3/22/2025	3/24/2025
SVC-00003	Brake inspection	1/11/2025	1/13/2025

1 - 6

Figure: 6.6

CUSTOMER_AGE_DEMOGRAPHICS	
Q	Go Actions
Agerange	Totalcustomers
26-35	5
36-50	5

1 - 2

Figure: 6.7

RECENT_BILLS			
Q	Go	Actions	
Billid	Serviceid	Totalamount	Billedate
B-110	SVC-00010	170	9/12/2025
B-109	SVC-00009	300	8/20/2025
B-108	SVC-00008	220	7/14/2025
B-106	SVC-00006	180	6/25/2025
B-104	SVC-00004	250	5/3/2025
B-105	SVC-00005	120	4/18/2025
B-102	SVC-00002	200	3/22/2025
B-107	SVC-00007	90	3/9/2025
B-101	SVC-00001	150	2/15/2025
B-103	SVC-00003	100	1/11/2025

1 - 10

Figure: 6.8

EMPLOYEE_NOT_CUSTOMER				
Q	Go	Actions		
Employeeid	EmployeeName	Address	Dob	Position
EMP-10010	Sumaiya Islam	Feni, Bangladesh	2/10/1996	Administrative Assistant
EMP-10009	Tanvir Chowdhury	Kishoreganj, Bangladesh	9/15/1992	Operations Manage
EMP-10007	Sayed Hassan	Noakhali, Bangladesh	6/23/1994	Data Analyst
EMP-10003	Karim Ali	Sylhet, Bangladesh	1/14/1975	Senior Officer
EMP-10006	Shamim Akter	Manikganj, Bangladesh	4/19/1989	Business Analyst
EMP-10008	Nafisa Tabassum	Brahmanbaria, Bangladesh	7/30/2001	Sales Executive

1 - 6

Figure: 6.9

VEHICLEREVENUE

Q	Go	Actions
Brand	Model	Total revenue
Toyota	Camry	250
Civic	Honda	200
Hyundai	Tucson	170
Toyota	Corolla	150
Mazda	MX-5	120
Honda	Accord	100
		1 - 6

Figure: 6.10

Authorization and User Role Assignment

User Role Assignment

User name	Password	Role
loser	Error404	Administrator
prova	prova1234	Administrator
asif	asif1234	viewer
mim	mim1234	Administrator
sumaiya	sumaiya1234	editor

Concluding Remarks

In conclusion, a Vehicle Management System (VMS) is key to managing vehicle data efficiently in an organization. By bringing together information on vehicles, drivers, maintenance, fuel usage, and billing in one system, we can make operations smoother, reduce manual work, and ensure everything is accurate. The system helps with planning, reporting, and improving decisions. With a VMS, we can use vehicles more effectively, save money, and keep track of safety and legal requirements. It also helps to improve routes, reduce costs, and increase overall fleet efficiency.