

CS457 - Data Modeling and Implementation Techniques
Fall 2020 Signature Assignment Report

Project Title

Chain Hotel Database Management System

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Presented To

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➤ Introduction

Hotel Management system is developed to manage a chain of hotels, where each hotel owns rooms and has employees. Each hotel also provides a wide array of services, which are booked in advance by customers, and provided by employees after full payment is made.

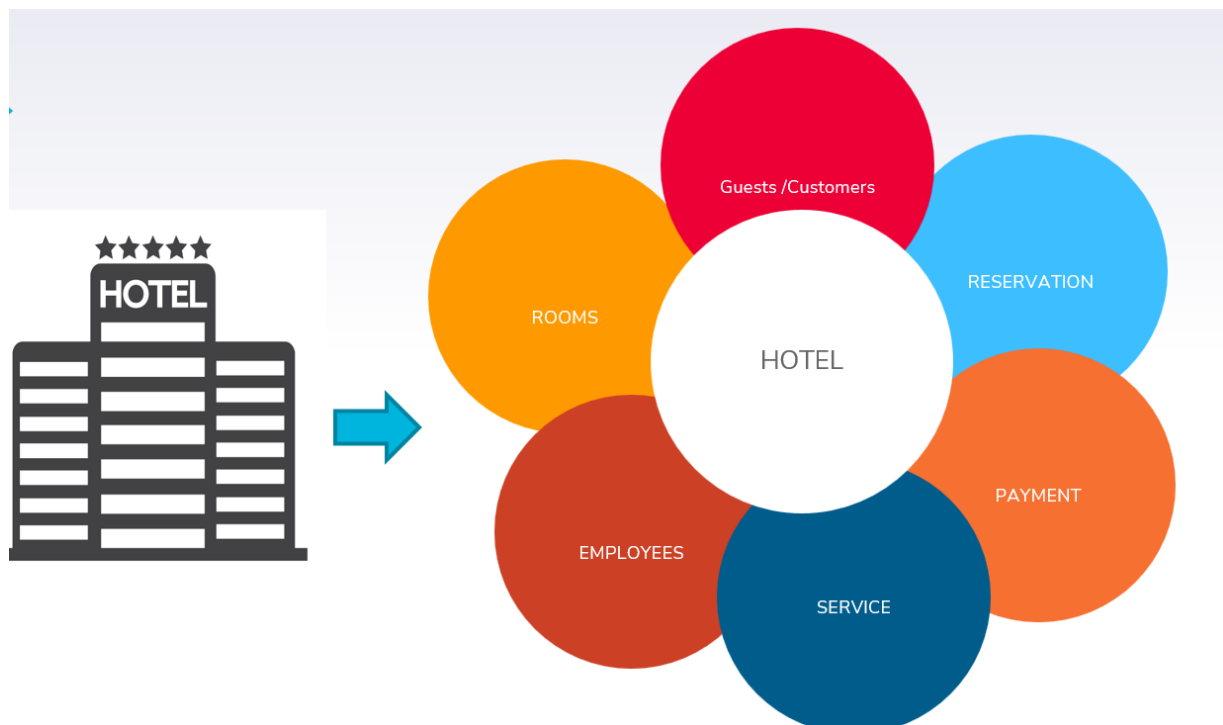


Figure 1: Chain Hotels Data Base Management Entities

The Business rules for the hotel management system is as follows:

- A Hotel has many rooms, and each room can be of different types.
- A hotel has many employees.
Each employee can provide different services.
- A customer can make many reservations. And each reservation generates a bill and is completed by bill Payment

- Payment activates different services.
- Services are provided by hotel employees

➤ **Entity Relationship Model**

Entity Relationship Model (ER Model) is the graphical representation that depicts relationships among people, objects, places, concepts or events within an information technology (IT) system.

Represents an object in the real world and gives us the logical view or the graphical representation.

Helps us to visualize the database and determine the relationship among different tables by making use of attributes, relations and entities.

ER Diagrams are most often used to design or debug relational databases in

Software Engineering

Business Information Systems

Education & Research

Database Troubleshooting

➤ Entity relationship model Diagram for the Hotel Management

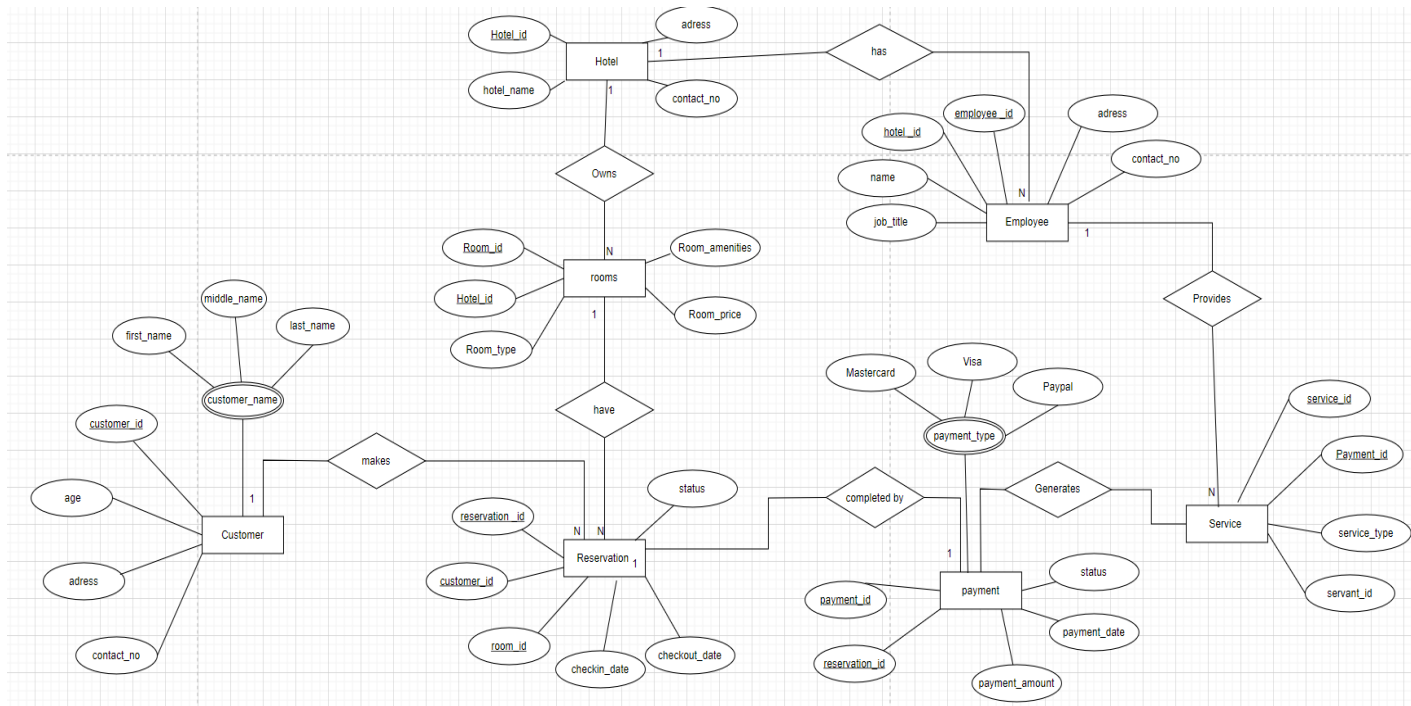


Figure 2: Hotel Data Base Management System ER diagram

➤ Schemas

```
MariaDB [19610dm]> select*from Hotel;
```

hotel_id	hotel_name	address	contact_no
H001	Murouj Hotel	Fremont, CA, 94539	925-239-1234
H002	Mina Hotel	Santa Clara, CA, 97119	925-239-1235
H003	Motel6 Hotel	San Francisco, CA, 94115	925-239-1236
H004	Shangrella Hotel	Los Angeles, CA, 93598	925-239-1237

4 rows in set (0.000 sec)

MariaDB [19610dm]> select*from Room;

room_id	hotel_id	room_type	amenities	room_price
0101	H001	Queen bedroom	WIFI, Washer/Drier, Kitchen	121.00
0102	H001	Queen bedroom	WIFI, Washer/Drier, Kitchen	130.00
0103	H001	Queen bedroom	WIFI, Washer/Drier, Kitchen	130.00
0104	H001	Twin bedroom	WIFI, Washer/Drier, Kitchen	150.00
0201	H002	Queen bedroom	WIFI, Washer/Drier, Kitchen	140.00
0202	H002	Double bedroom	WIFI, Washer/Drier, Kitchen, Play Station	180.00
0203	H002	Twin bedroom	WIFI, Washer/Drier, Kitchen, Play Station	200.00
0204	H002	Studio bedroom	WIFI, Washer/Drier, Kitchen, Play Station	250.00
0301	H003	Queen bedroom	WIFI, Washer/Drier, Kitchen	180.00
0302	H003	Twin bedroom	WIFI, Washer/Drier, Kitchen	180.00
0303	H003	Twin bedroom	WIFI, Washer/Drier, Kitchen	120.00
0304	H003	King bedroom	WIFI, Washer/Drier, Kitchen	160.00
0401	H004	King bedroom	WIFI, Washer/Drier, Kitchen	160.00
0402	H004	King bedroom	WIFI, Washer/Drier, Kitchen, Game Station	190.00
0403	H004	Queen bedroom	WIFI, Washer/Drier, Kitchen, Game Station	200.00

15 rows in set (0.000 sec)

MariaDB [19610dm]> select*from Customers;

customer_id	first_name	middle_name	last_name	age	address	contact_no
10001	Min	Joy	Koyie	29	210 E Warren, Fremont, CA, 94536	923-319-3425
10002	Kim	Roy	Emanueal	50	1413 Warm Springs, Fremont, CA, 94539	923-319-3426
10003	Mahmud	Omar	Adam	16	1819 Osgood Road, Fremont, CA, 94540	923-119-3429
10004	Rakish	Prince	Vijay	32	2536 Osgood Road, Fremont, CA, 94540	923-119-3422
10005	Lee	None	Kim	45	2029 Liberty Ave, Brookelyn, CA, 94501	923-129-1002
10006	Mun	Lee	Joe	45	2120 North West Ave, Brookelyn, CA, 94501	923-129-1012
10007	Liza	Biden	Lee	35	130 North West Ave, Brookelyn, CA, 94501	923-129-2021
10008	Kayle	Tesfome	Amarie	22	23958 West North Ave, San Jose, CA, 92363	925-129-2019
10009	Fatma	None	Humed	34	210 E Warren, San Jose, CA, 93511	925-129-1044
10010	John	None	Alamu	19	211 West Ave, Santa Clara, CA, 96332	925-335-2022

10 rows in set (0.000 sec)

MariaDB [19610dm]> select*from Reservation;

reservation_id	customer_id	room_id	hotel_id	checkin_date	checkout_date	status
R001	10001	0101	H001	2022-12-14	2022-12-15	Booked
R002	10001	0102	H001	2022-12-14	2022-12-25	Reserved
R003	10002	0103	H001	2022-12-17	2022-12-31	Reserved
R004	10002	0104	H001	2023-01-12	2023-04-15	Booked
R005	10004	0201	H002	2023-02-10	2023-02-15	Booked
R006	10008	0101	H002	2023-01-11	2023-05-11	Booked
R007	10008	0101	H003	2023-01-11	2023-03-08	Booked
R008	10010	0202	H004	2023-11-11	2023-12-01	Reserved
R009	10007	0302	H001	2023-01-25	2023-12-25	Reserved
R010	10005	0302	H002	2023-01-25	2023-07-04	Unconfirmed

10 rows in set (0.000 sec)

MariaDB [19610dm]> select*from Service;

service_id	payment_id	service_type	servant_id
S0001	P0001	Hotel Stay	10001
S0002	P0001	Room Cleaning	10002
S0003	P0001	24hr Security	10003
S0004	P0002	Gym	10004
S0005	P0002	Part-time Security	10005
S0006	P0003	Pool	10006
S0007	P0003	Restaurant	10007
S0008	P0003	Arcade	10008

8 rows in set (0.000 sec)

MariaDB [19610dm]> select*from Payment;

payment_id	reservation_id	payment_type	payment_amount_\$	payment_date	status
P0001	R001	Credit Card	130.00	2022-12-01	Paid
P0002	R002	Visa	130.00	2022-10-01	Paid
P0003	R003	Master Card	130.00	2022-11-01	Pending
P0004	R004	Cash	150.00	2022-11-01	Paid
P0005	R005	Visa	140.00	2022-11-01	Paid
P0006	R006	PayPal	130.00	2022-09-21	Paid
P0007	R007	Master Card	130.00	2022-12-21	Paid
P0008	R008	Credit Card	125.00	2022-12-01	Paid
P0009	R009	Visa	180.00	2022-10-01	Pending
P0010	R010	PayPal	180.00	2022-12-01	Pending

10 rows in set (0.000 sec)

MariaDB [19610dm]> select*from Employee;

employee_id	hotel_id	first_name	middle_name	last_name	job_title	address	contact_no
10001	H001	Lee	Yo	Kim	Receptionist	210 E Warrene, San Jose, 94501	923-120-3455
10002	H001	Jhon	Lee	Moon	Cleaner	210 E Warrene, Fremont, 94599	923-120-3400
10003	H001	Emly	Jonson	Meer	Security	2390 Osgood Rd, Fremont, 94597	923-111-3400
10004	H002	July	Emerson	Miran	Receptionist	405 Andre Street, Oakland, CA, 93500	823-111-3401
10005	H001	Muna	Adamson	Kong	Manager	450 Liberty Street, Oakland, CA, 93501	723-111-5555
10006	H002	Vijay	Kumar	Marison	Security	1425 West Cmn, San Francisco, CA, 93533	523-312-5554
10007	H003	Shakti	Singh	Phani	Receptionist	1425 East Warren, Fremont, CA, 94982	923-312-8977
10008	H003	Musie	Andom	Klark	Cleaner	1425 Angelo, Los Angeles, CA, 83501	323-312-5554
10009	H004	Omar	Reson	Klark	Receptionist	3923 Angelo, Los Angeles, CA, 83501	323-010-3321
10010	H004	Vinod	Jakson	Lee	Security	3545 West Coast, San Mateo, CA, 82913	321-010-3329

10 rows in set (0.000 sec)

➤ Queries:

MariaDB [19610dm]> SELECT * FROM Payment WHERE payment_type = "Credit Card";

payment_id	reservation_id	payment_type	payment_amount_\$	payment_date	status
P0001	R001	Credit Card	130.00	2022-12-01	Paid
P0008	R008	Credit Card	125.00	2022-12-01	Paid

2 rows in set (0.000 sec)

MariaDB [19610dm]> SELECT customer_id FROM Reservation WHERE reservation_id = "R001";

```
+-----+
| customer_id |
+-----+
|      10001 |
+-----+
```

1 row in set (0.000 sec)

MariaDB [19610dm]> SELECT * FROM Customers WHERE customer_id = "10001";

```
+-----+-----+-----+-----+-----+-----+-----+-----+
| customer_id | first_name | middle_name | last_name | age | address | contact_no |
+-----+-----+-----+-----+-----+-----+-----+-----+
|      10001 | Min       | Joy        | Koyie    | 29 | 210 E Warren, Fremont, CA, 94536 | 923-319-3425 |
+-----+-----+-----+-----+-----+-----+-----+-----+
```

1 row in set (0.000 sec)

MariaDB [19610dm]> UPDATE Room SET room_price = 121.00 where room_id = "0101";

Query OK, 0 rows affected (0.000 sec)

Rows matched: 1 Changed: 0 Warnings: 0

MariaDB [19610dm]> select * from Room;

```
+-----+-----+-----+-----+-----+-----+
| room_id | hotel_id | room_type | amenities | room_price |
+-----+-----+-----+-----+-----+-----+
| 0101    | H001    | Queen bedroom | WIFI, Washer/Drier, Kitchen | 121.00 |
| 0102    | H001    | Queen bedroom | WIFI, Washer/Drier, Kitchen | 130.00 |
| 0103    | H001    | Queen bedroom | WIFI, Washer/Drier, Kitchen | 130.00 |
| 0104    | H001    | Twin bedroom  | WIFI, Washer/Drier, Kitchen | 150.00 |
| 0201    | H002    | Queen bedroom | WIFI, Washer/Drier, Kitchen | 140.00 |
| 0202    | H002    | Double bedroom | WIFI, Washer/Drier, Kitchen, Play Station | 180.00 |
| 0203    | H002    | Twin bedroom  | WIFI, Washer/Drier, Kitchen, Play Station | 200.00 |
| 0204    | H002    | Studio bedroom | WIFI, Washer/Drier, Kitchen, Play Station | 250.00 |
| 0301    | H003    | Queen bedroom | WIFI, Washer/Drier, Kitchen | 180.00 |
| 0302    | H003    | Twin bedroom  | WIFI, Washer/Drier, Kitchen | 180.00 |
| 0303    | H003    | Twin bedroom  | WIFI, Washer/Drier, Kitchen | 120.00 |
| 0304    | H003    | King bedroom  | WIFI, Washer/Drier, Kitchen | 160.00 |
| 0401    | H004    | King bedroom  | WIFI, Washer/Drier, Kitchen | 160.00 |
| 0402    | H004    | King bedroom  | WIFI, Washer/Drier, Kitchen, Game Station | 190.00 |
| 0403    | H004    | Queen bedroom | WIFI, Washer/Drier, Kitchen, Game Station | 200.00 |
+-----+-----+-----+-----+-----+-----+
```

15 rows in set (0.000 sec)

MariaDB [19610dm]> alter table Hotel add capacity int;

Query OK, 0 rows affected (0.003 sec)

Records: 0 Duplicates: 0 Warnings: 0

MariaDB [19610dm]> select * from Hotel;

```
+-----+-----+-----+-----+-----+
| hotel_id | hotel_name | address | contact_no | capacity |
+-----+-----+-----+-----+-----+
| H001    | Murouj Hotel | Fremont, CA, 94539 | 925-239-1234 | NULL |
| H002    | Mina Hotel    | Santa Clara, CA, 97119 | 925-239-1235 | NULL |
| H003    | Motel6 Hotel | San Francisco, CA, 94115 | 925-239-1236 | NULL |
| H004    | Shangrella Hotel | Los Angeles, CA, 93598 | 925-239-1237 | NULL |
+-----+-----+-----+-----+-----+
```

4 rows in set (0.000 sec)

MariaDB [19610dm]> alter table Hotel drop capacity;

Query OK, 0 rows affected (0.022 sec)

Records: 0 Duplicates: 0 Warnings: 0

MariaDB [19610dm]> select * from Hotel;

hotel_id	hotel_name	address	contact_no	capacity
H001	Murouj Hotel	Fremont, CA, 94539	925-239-1234	NULL
H002	Mina Hotel	Santa Clara, CA, 97119	925-239-1235	NULL
H003	Motel6 Hotel	San Francisco, CA, 94115	925-239-1236	NULL
H004	Shangrella Hotel	Los Angeles, CA, 93598	925-239-1237	NULL

4 rows in set (0.000 sec)

MariaDB [19610dm]> alter table Hotel drop capacity;

Query OK, 0 rows affected (0.022 sec)

Records: 0 Duplicates: 0 Warnings: 0

MariaDB [19610dm]> select * from Hotel;

hotel_id	hotel_name	address	contact_no
H001	Murouj Hotel	Fremont, CA, 94539	925-239-1234
H002	Mina Hotel	Santa Clara, CA, 97119	925-239-1235
H003	Motel6 Hotel	San Francisco, CA, 94115	925-239-1236
H004	Shangrella Hotel	Los Angeles, CA, 93598	925-239-1237

4 rows in set (0.001 sec)

MariaDB [19610dm]> SELECT * FROM Customers WHERE (customer_id) IN (SELECT customer_id FROM Reservation WHERE reservation_id = "R001");

customer_id	first_name	middle_name	last_name	age	address	contact_no
10001	Min	Joy	Koyie	29	210 E Warren, Fremont, CA, 94536	923-319-3425

1 row in set (0.000 sec)

MariaDB [19610dm]> SELECT first_name,last_name, contact_no FROM Customers WHERE (customer_id) IN (SELECT customer_id FROM Reservation WHERE hotel_id = "H002");

first_name	last_name	contact_no
Rakish	Vijay	923-119-3422
Lee	Kim	923-129-1002
Kayle	Amarie	925-129-2019

3 rows in set (0.000 sec)

MariaDB [19610dm]> select c.first_name, c.last_name, c.contact_no, r.checkin_date, r.checkout_date from Customers c inner join Reservation r on c.customer_id = r.customer_id;

first_name	last_name	contact_no	checkin_date	checkout_date
Min	Koyie	923-319-3425	2022-12-14	2022-12-15
Min	Koyie	923-319-3425	2022-12-14	2022-12-25
Kim	Emanueal	923-319-3426	2022-12-17	2022-12-31
Kim	Emanueal	923-319-3426	2023-01-12	2023-04-15
Rakish	Vijay	923-119-3422	2023-02-10	2023-02-15
Kayle	Amarie	925-129-2019	2023-01-11	2023-05-11
Kayle	Amarie	925-129-2019	2023-01-11	2023-03-08
John	Alamu	925-335-2022	2023-11-11	2023-12-01
Liza	Lee	923-129-2021	2023-01-25	2023-12-25
Lee	Kim	923-129-1002	2023-01-25	2023-07-04

10 rows in set (0.000 sec)

MariaDB [19610dm]> SELECT Service.service_type,Employee.first_name ,Employee.last_name, Employee.contact_no FROM Employee LEFT JOIN Service on Employee.employee_id = Service.servant_id ;

service_type	first_name	last_name	contact_no
Hotel Stay	Lee	Kim	923-120-3455
Room Cleaning	Jhon	Moon	923-120-3400
24hr Security	Emly	Meer	923-111-3400
Gym	July	Miran	823-111-3401
Part-time Security	Muna	Kong	723-111-5555
Pool	Vijay	Marison	523-312-5554
Restaurant	Shakti	Phani	923-312-8977
Arcade	Musie	Klark	323-312-5554
NULL	Omar	Klark	323-010-3321
NULL	Vinod	Lee	321-010-3329

10 rows in set (0.000 sec)

MariaDB [19610dm]> SELECT first_name, middle_name, last_name, job_title, employee_id
-> FROM (Employee e LEFT JOIN Hotel h on e.hotel_id = h.hotel_id)
-> WHERE e.job_title = 'Security';

first_name	middle_name	last_name	job_title	employee_id
Emly	Jonson	Meer	Security	10003
Vijay	Kumar	Marison	Security	10006
Vinod	Jakson	Lee	Security	10010

3 rows in set (0.000 sec)


```
MariaDB [19660om]> select c.first_name, c.last_name, c.customer_id from
-> ((Customers c inner join Reservation r on c.customer_id = r.customer_id) inner join Payment p on r.reservation_id = p.reservation_id);
```

first_name	last_name	customer_id
Min	Koyie	10001
Min	Koyie	10001
Kim	Emanueal	10002
Kim	Emanueal	10002
Rakish	Vijay	10004
Kayle	Amarie	10008
Kayle	Amarie	10008
John	Alamu	10010
Liza	Lee	10007

```
MariaDB [19660om]> select c.customer_id, r.room_id, r.hotel_id, r.checkin_date, r.checkout_date, p.payment_type, p.payment_amount
-> from ((Customers c inner join Reservation r on c.customer_id = r.customer_id) inner join Payment p on r.reservation_id = p.reservation_id);
```

customer_id	room_id	hotel_id	checkin_date	checkout_date	payment_type	payment_amount
10001	0101	H001	2022-12-14	2022-12-13	Credit Card	130.00
10001	0102	H001	2022-12-14	2022-12-13	Visa	130.00
10002	0103	H001	2022-12-17	2022-12-18	Master Card	130.00
10002	0104	H001	2022-01-12	2022-01-13	Cash	150.00
10004	0201	H002	2023-02-10	2023-02-11	Visa	140.00
10008	0101	H002	2023-01-11	2023-01-12	PayPal	130.00
10008	0101	H003	2023-01-11	2023-01-12	Master Card	130.00
10010	0202	H004	2023-11-11	2023-11-14	Visa	180.00
10007	0302	H001	2023-01-25	2023-01-14	PayPal	180.00

```
MariaDB [19610dm]> select c.customer_id, c.first_name, c.last_name, c.age from
-> ((Customers c join Reservation r on c.customer_id = r.customer_id) join Payment p on p.reservation_id = r.reservation_id)
-> where r.status = 'Booked' and p.status = 'Paid';
```

customer_id	first_name	last_name	age
10001	Min	Koyie	29
10002	Kim	Emanueal	50
10004	Rakish	Vijay	32
10008	Kayle	Amarie	22
10008	Kayle	Amarie	22

5 rows in set (0.000 sec)

➤ Summary

The Presented Hotel Management System successfully facilitates the management of internal hotel activities and resources such as room management, employee's data and services. The system also manages reservations record, payment history, and customer data