



Wolaita Sodo University

Collage of : Informatics

Departement of : Computer science

Course tittle : Advanced database system

Course code: cosc2024

Group member

Student Name

ID number

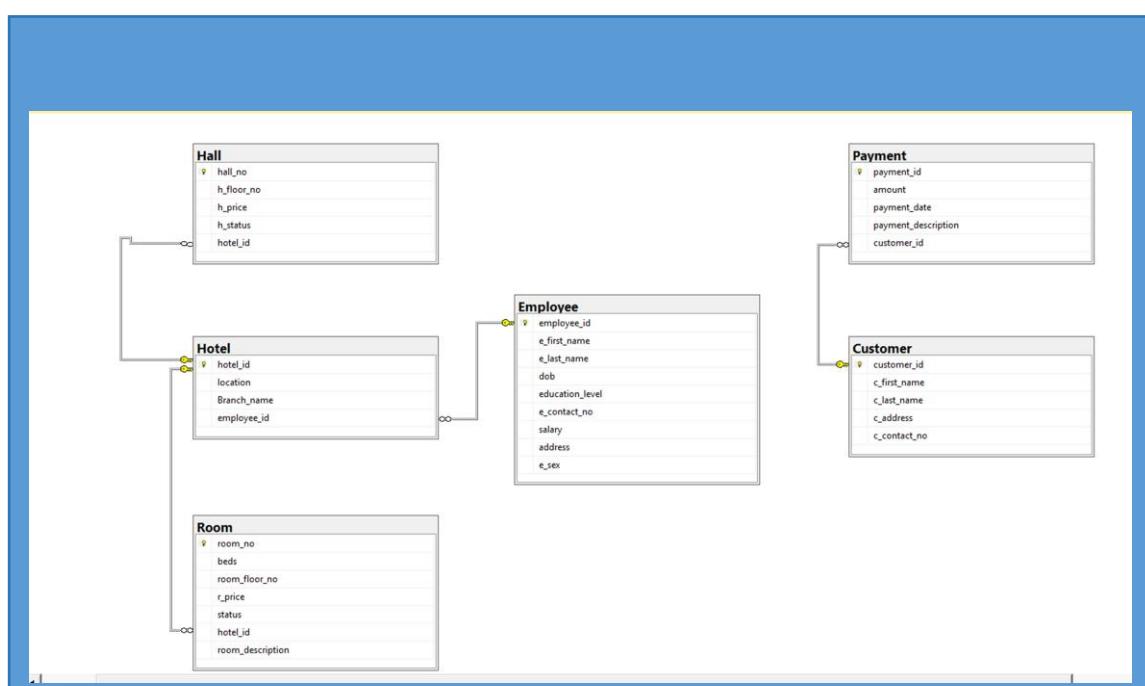
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Introduction

The Hotel Management System project is designed to demonstrate the structure and functionality of a relational database system tailored for managing hotel operations. This system models real-world hotel processes such as customer management, employee administration, room and hall bookings, payment tracking, and role-based access control. The database uses structured tables, keys, constraints, and relationships to ensure data integrity and consistency. Additionally, it implements transactions, stored procedures, views, and permissions to showcase essential database management features and security.

The aim of this project is to provide a reliable back-end solution that can support common hotel activities like registering customers, assigning rooms, handling payments, managing employees, and generating statistical reports — all through well-organized and normalized tables with real-life sample data.

#TASK ONE DATABASE DIAGRAM



Before transaction begin all table

Results Messages

	customer_id	c_first_name	c_last_name	c_address	c_contact_no
1	1	Abebe	Kebede	Bole Road, Addis Ababa	+251911223344
2	2	Meron	Girma	Mexico Square, Addis Ababa	+251922334455
3	3	Tewodros	Assefa	Gondar, Amhara Region	+251933445566
4	4	Selamawit	Tesfaye	Hawassa, Sidama Region	+251944556677
5	5	Yohannes	Mulugeta	Arat Kilo, Addis Ababa	+251955667788

Results Messages

	employee_id	e_first_name	e_last_name	dob	education_level	e_contact_no	salary	address	e_sex
1	101	Alemayehu	Gessesse	1985-03-15	Bachelor Degree	+251911112222	15000.00	Kirkos Subcity, Addis Ababa	M
2	102	Etenesh	Worku	1990-07-22	Diploma	+251922223333	12000.00	Kazanchis, Addis Ababa	F
3	103	Getachew	Mekonnen	1988-11-30	Masters Degree	+251933334444	20000.00	Bole, Addis Ababa	M
4	104	Hirut	Alemu	1992-05-18	Certificate	+251944445555	10000.00	Piassa, Addis Ababa	F
5	105	Dawit	Wolde	1980-01-10	PhD	+251955556666	30000.00	Old Airport, Addis Ababa	M

Results Messages

	payment_id	amount	payment_date	payment_description	customer_id
1	5001	3500.00	2023-10-01	Room booking for 2 nights	2
2	5002	7000.00	2023-10-05	Conference hall booking	4
3	5003	2500.00	2023-10-10	Single room booking	1
4	5004	9000.00	2023-10-15	3 nights deluxe room	5
5	5005	4500.00	2023-10-20	Family room booking	3

	hotel_id	location	Branch_name	employee_id
1	1001	Arat Kilo, Addis Ababa	Haile Hotel Addis	103
2	1002	Gondar, Amhara Region	Haile Hotel Gondar	105
3	1003	Hawassa, Sidama Reg...	Haile Hotel Hawa...	101

	hall_no	h_floor_no	h_price	h_status	hotel_id
1	1	1	15000.00	Booked	1001
2	2	1	12000.00	Available	1001
3	3	1	18000.00	Available	1003
4	4	2	10000.00	Available	1002
5	5	1	15000.00	Booked	1003

Results Messages

	room_no	beds	room_floor_no	r_price	status	hotel_id	room_description
1	11	1	1	2500.00	Available	1001	NULL
2	12	2	1	3500.00	Occupied	1001	NULL
3	13	1	2	2700.00	Available	1001	NULL
4	14	2	2	3700.00	Available	1001	NULL
5	15	3	3	4500.00	Maintenance	1001	NULL
6	16	1	1	2000.00	Available	1002	NULL
7	17	2	1	3000.00	Available	1002	NULL
8	18	1	1	2300.00	Occupied	1003	NULL
9	19	2	1	3300.00	Available	1003	NULL

#TASK TWO

Implement transaction management for critical operations.

```
--- first transaction with commit
BEGIN TRANSACTION;
INSERT INTO Customer (customer_id, c_first_name, c_last_name,
c_address, c_contact_no)
VALUES (7, 'Sal', 'Tes', 'Bole, Addis Ababa', '+251966778899');
UPDATE Room SET status = 'Occupied'
WHERE room_no = 13 AND hotel_id = 1001 AND status = 'Available';
COMMIT TRANSACTION;

----- second transaction with savepoint

BEGIN TRANSACTION;
DELETE FROM Payment WHERE customer_id = 3;
save transaction AfterPaymentDelete;
DELETE FROM Payment WHERE customer_id = 6;
rollback TRANSACTION AfterPaymentDelete;

--- third transaction with rollback
select*from Room
begin transaction
UPDATE Room SET status = 'Occupied'
WHERE room_no = 13 AND hotel_id =1001;
rollback
```

#TASK THREE

Demonstrate the use of commit, rollback and savepoints.

Commit : Save transaction permanently in database . In this case the transaction can not be roll back.

Savepoints: A transaction allow rollback after savepoint set but not entire transaction.

rollback :Undo the changes made during the current transaction

Transaction one
Save permanently

	customer_id	c_first_name	c_last_name	c_address	c_contact_no
1	1	Abebe	Kebede	Bole Road, Addis Ababa	+251911223344
2	2	Meron	Girma	Mexico Square, Addis Ababa	+251922334455
3	3	Tewodros	Assefa	Gondar, Amhara Region	+251933445566
4	4	Selamawit	Tesfaye	Hawassa, Sidama Region	+251944556677
5	5	Yohannes	Mulugeta	Arat Kilo, Addis Ababa	+251955667788
6	7	Sal	Tes	Bole, Addis Ababa	+251966778899

	room_no	beds	room_floor_no	r_price	status	hotel_id	room_description
1	11	1	1	2500.00	Available	1001	NULL
2	12	Click to select the whole column		10	Occupied	1001	NULL
3	13	1	2	2700.00	Occupied	1001	NULL
4	14	2	2	3700.00	Available	1001	NULL
5	15	3	3	4500.00	Maintenance	1001	NULL
6	16	1	1	2000.00	Available	1002	NULL
7	17	2	1	3000.00	Available	1002	NULL
8	18	1	1	2300.00	Occupied	1003	NULL
9	19	2	1	3300.00	Available	1003	NULL

Transaction two
After use savepoint

	payment_id	amount	payment_date	payment_description	customer_id
1	5001	3500.00	2023-10-01	Room booking for 2 nights	2
2	5002	7000.00	2023-10-05	Conference hall booking	4
3	5003	2500.00	2023-10-10	Single room booking	1
4	5004	9000.00	2023-10-15	3 nights deluxe room	5

before use to rollback transaction

	payment_id	amount	payment_date	payment_description	customer_id
1	5002	7000.00	2023-10-05	Conference hall booking	4
2	5003	2500.00	2023-10-10	Single room booking	1
3	5004	9000.00	2023-10-15	3 nights deluxe room	5

Aftre use to rollback transaction

	payment_id	amount	payment_date	payment_description	customer_id
1	5001	3500.00	2023-10-01	Room booking for 2 nights	2
2	5002	7000.00	2023-10-05	Conference hall booking	4
3	5003	2500.00	2023-10-10	Single room booking	1
4	5004	9000.00	2023-10-15	3 nights deluxe room	5

Transaction three use to before rollback

	customer_id	c_first_name	c_last_name	c_address	c_contact_no
1	1	Aster	Kebede	Bole Road, Addis Ababa	+251911223344
2	2	Meron	Girma	Mexico Square, Addis Ababa	+251922334455
3	3	Tewodros	Assefa	Gondar, Amhara Region	+251933445566
4	4	Selamawit	Tesfaye	Hawassa, Sidama Region	+251944556677
5	5	Yohannes	Mulugeta	Arat Kilo, Addis Ababa	+251955667788

Transaction three after rollback

	customer_id	c_first_name	c_last_name	c_address	c_contact_no
1	1	Abebe	Kebede	Bole Road, Addis Ababa	+251911223344
2	2	Meron	Girma	Mexico Square, Addis Ababa	+251922334455
3	3	Tewodros	Assefa	Gondar, Amhara Region	+251933445566
4	4	Selamawit	Tesfaye	Hawassa, Sidama Region	+251944556677
5	5	Yohannes	Mulugeta	Arat Kilo, Addis Ababa	+251955667788

#TASK FOUR

This code shows all current locks held in the database
Identifies what resources are locked and by which sessions

```
select
    request_session_id ,
    request_mode,
    request_type ,
    resource_type,
    resource_description,
    request_status
from sys.dm_tran_locks;
select
    session_id,
    wait_duration_ms,
    wait_type ,
    blocking_session_id,
    resource_description
from sys.dm_os_waiting_tasks;
select
    session_id,
    status ,
    wait_type ,
    wait_time ,
    wait_resource,
    command
from sys.dm_exec_requests;
```

```

USE HotelManagementSystem
SELECT * FROM Customer

```

customer_id	c_first_name	c_last_name	c_address	c_contact_no
1	Abebe	Kebede	Bole Road, Addis Ababa	+251911223344
2	Meron	Girma	Mexico Square, Addis Ababa	+251922334455
3	Tewodros	Assefa	Gondar, Amhara Region	+251933445566
4	Selamawit	Tesfaye	Hawassa, Sidama Region	+251944556677
5	Yohannes	Mutugeta	Aral Kilo, Addis Ababa	+251955667788

Check exclusive lock

```

USE HotelManagementSystem
BEGIN TRANSACTION
UPDATE Customer SET c_first_name='lema' WHERE customer_id=3;

```

(1 row affected)

Completion time: 2025-06-10T00:18:49.6132182-07:00

```

USE HotelManagementSystem
BEGIN TRANSACTION
SELECT * FROM Customer

```

```

SELECT
    wait_type,
    blocking_session_id,
    resource_description
FROM sys.dm_os_waiting_tasks

SELECT
    session_id,
    status,
    wait_type,
    wait_time,
    wait_resource,
    command
FROM sys.dm_exec_requests

```

request_session_id	request_mode	request_type	resource_type	resource_description	request_status
5	S	LOCK	DATABASE		GRANT
6	S	LOCK	DATABASE		GRANT
7	IX	LOCK	PAGE	1:352	GRANT
8	IS	LOCK	PAGE	1:352	GRANT
9	X	LOCK	KEY	(98ec012aa510)	GRANT
10	S	LOCK	KEY	(98ec012aa510)	WAIT
11	IX	LOCK	OBJECT		GRANT
12	IS	LOCK	OBJECT		GRANT

Session - 55 waiting until session 74 transaction commit or roll back.
After transaction session id 74 rollback . the lock is release and then transaction session id 55 excute

```

SELECT
    wait_type,
    blocking_session_id,
    resource_description
FROM sys.dm_os_waiting_tasks

SELECT
    session_id,
    status,
    wait_type,
    wait_time,
    wait_resource,
    command
FROM sys.dm_exec_requests

```

request_session_id	request_mode	request_type	resource_type	resource_description	request_status
1	S	LOCK	DATABASE		GRANT
2	S	LOCK	DATABASE		GRANT
3	S	LOCK	DATABASE		GRANT
4	S	LOCK	DATABASE		GRANT
5	S	LOCK	DATABASE		GRANT

#TASK FIVE

Managing User Access and Permissions in SQL Server

This script demonstrates how to create a login, assign roles, grant data access with delegation rights, and revoke specific grant options to control permission propagation in a secure way.

```
CREATE LOGIN HOTEL WITH PASSWORD = '55555';
GO
CREATE USER GROUP8 FOR LOGIN HOTEL;
GO
CREATE ROLE G_G8;
GO
SP_ADDROLEMEMBER 'G_G8', 'GROUP8';
GO
```

0 % ▶

Messages

Commands completed successfully.

Completion time: 2025-06-10T00:59:45.6272037-07:00

```
GRANT SELECT,UPDATE , INSERT ON customer TO TIZU WITH GRANT OPTION;
GO

REVOKE GRANT OPTION FOR SELECT ON customer FROM TIZU CASCADE
REVOKE GRANT OPTION FOR SELECT ON customer FROM TIZU
GO
```

90 % ▶

Messages

Commands completed successfully.

Completion time: 2025-06-10T01:06:46.3803870-07:00

#TASK SIX

Demonstrate how to handle statistical database security

The `EmployeeStats` view provides only aggregated salary data (average, minimum, and maximum) to protect individual employee privacy. Granting `SELECT` access to `Group8` ensures users can analyze data without accessing sensitive personal details. This supports secure statistical reporting.

```
-- View with statistical data only
CREATE VIEW EmployeeStats AS
SELECT AVG(salary) AS avg_salary, MIN(salary) AS min_salary, MAX(salary) AS max_salary
FROM Employee;

GRANT SELECT ON EmployeeStats TO Group8;
```

121 % → 4
Messages
Commands completed successfully.
Completion time: 2025-06-11T13:32:41.7853644-07:00

```
SQLQuery2.sql - DE...system (HOTEL7(7)) * # × [hotel management sys...azam]
USE HotelManagementSystem
select * from EmployeeStats;
```

121 % → 4
Results # Messages

	avg_salary	min_salary	max_salary
1	17400.000000	10000.00	30000.00

Conclusion

In conclusion, the Hotel Management System database successfully captures the core entities and operations of a typical hotel business. It maintains accurate records of customers, employees, hotels, rooms, payments, and halls, while also enforcing relationships and constraints to uphold data integrity. Through the use of transactions, the database ensures safe and reversible operations. Furthermore, the incorporation of views, stored procedures, and access roles enhances data security and usability.

This system provides a strong foundation for future enhancements, such as integrating a front-end interface, expanding to include online bookings, or connecting with inventory and service modules. Overall, the project demonstrates effective use of SQL to manage and secure complex business data in a structured and maintainable way