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❖ INTRODUCTION

The **restaurant** industry is highly competitive and constantly evolving, requiring efficient management and innovative solutions to meet customer demands. This project aims to develop a comprehensive restaurant management system, designed to streamline operations, enhance customer experience, and improve overall efficiency.

Our system will cover essential areas such as reservations, menu management, order processing, inventory tracking, and customer feedback. Through a combination of user-friendly interfaces and backend functionality, the project seeks to offer a seamless experience for both restaurant staff and patrons. Ultimately, this project will showcase how technology can drive success in the food and hospitality sector by optimizing everyday processes and creating meaningful interactions.

The restaurant management system includes different factors as ,customers,reservations,orders,order items,food items that are available in the restaurant.

Every customer in the restaurant is identified by their full name, gender and email id to give better service and manage the feedback of the cutomer.

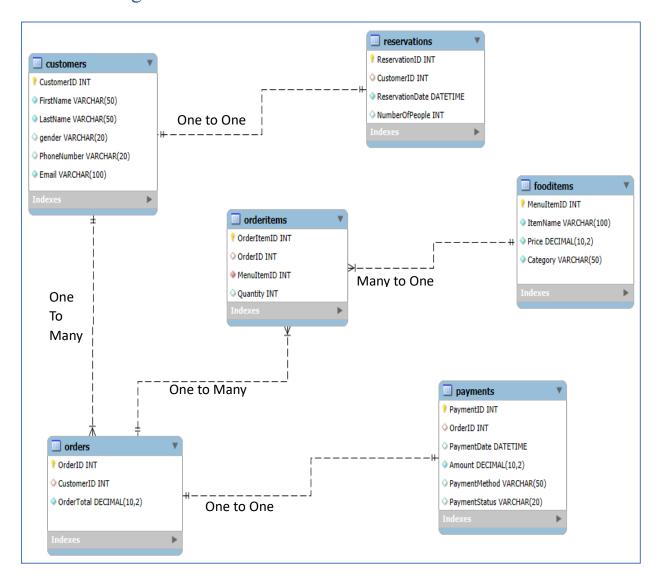
For reservation criteria the cutomer gets reservation id,reservation date,customer id and also the number of people for which the reservation is done.

The customer also get provided the ordered item information, order id, menu item id and the quantity that they ordered. One customer can order many food items at a time.

The food items in the restaurant are clearly detailed with the menu item name, menu item id, the price of the food and the category in which the food is belong like snacks, main course, etc. Different food items are available for each customer.

The customer can use any payment method to pay the bill like Debit card, UPI, etc. all the information i.e payment id, payment date, amount, payment method and payment status is recorded by the restaurant to abuse further customer complaints.

* ER Diagram



The **ER Diagram** shows us the relational database management system i.e. The relations in the tables of the Restaurant Management System .It shows how one factor is related with the other fators with one to one relation, one to many relation and many to one relations.

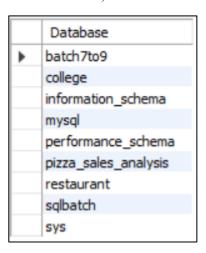
Databases:

To create a new database:

create database restaurant;

Use restaurant;

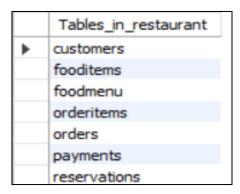
Show databases;



Tables in Restaurant database:

To find all present Tables in the Restaurant database:

Show Tables from Restaurant;



1.DATA DEFINITION LANGUAGE(DDL)

1.Creating tables:

A)Customers:

Create table customers (customerid int primary key,

Firstname varchar(50) not null,

Lastname varchar(50) not null, gender varchar(20),

Phonenumber varchar(15),

Email varchar(100) not null unique);

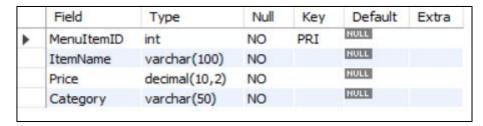
Desc customers;

	Field	Type	Null	Key	Default	Extra
•	CustomerID	int	NO	PRI	NULL	
	FirstName	varchar(50)	NO		NULL	
	LastName	varchar(50)	NO		NULL	
	gender	varchar(20)	YES		NULL	
	PhoneNumber	varchar(20)	YES		NULL	
	Email	varchar(100)	NO	UNI	NULL	

B)Menuitems:

Create table Menuitems (menuitemid int primary key, Itemname varchar(100) not null, Price decimal(10, 2) not null check (price >= 0), Category varchar(50) not null);

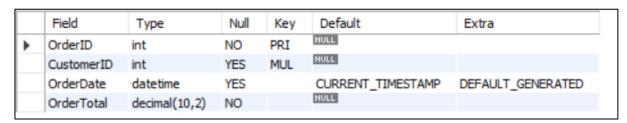
Desc menuitems;



C)Orders:

Create table Orders (OrderID int primary key, CustomerID int, OrderDate datetime default current_timestamp, Totalamount decimal(10, 2) not null, foreign key (customerid) references Customers(customerid));

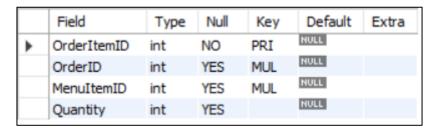
Desc Orders;



D)OrderItems:

Create table OrderItems (OrderItemID int primary key,OrderID int,MenuItemID int,Quantity int check (Quantity > 0),foreign key (OrderID) references Orders(OrderID),foreign key (MenuItemID) references MenuItems(MenuItemID));

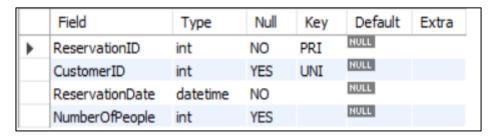
Desc OrderItems;



E)Reservations:

Create table Reservations (ReservationID int primary key,CustomerID int unique,ReservationDate datetime not null,NumberOfPeople int check (NumberOfPeople > 0),Foreign key (CustomerID) References Customers(CustomerID));

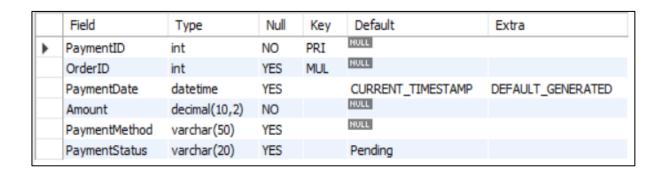
Desc Reservations;



F)Payments:

Create table Payments(PaymentID int primary key,OrderID int,PaymentDate datetime default current_timestamp,Amount decimal(10, 2) not null,PaymentMethod varchar(50),Foreign key (OrderiID) references Orders(OrderID));

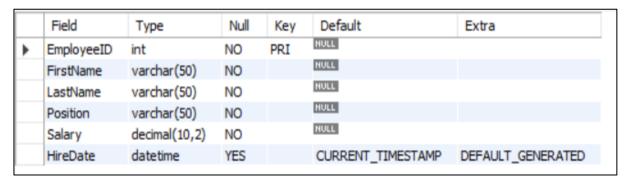
Desc Payments;



G)Employees:

Create table Employees (EmployeeID int primary key,FirstName varchar(50) not null,LastName varchar(50) not null,Position varchar(50) not null,Salary decimal(10, 2) not null,HireDate datetime default current timestamp);

Desc Employees;



2. Alter table:

• Alter Table : Add Column

Add a new column paymentstatus to the payments table.

Alter table Payments add PaymentStatus varchar(20) default 'Pending';

	Field	Type	Null	Key	Default	Extra
•	PaymentID	int	NO	PRI	NULL	
	OrderID	int	YES	MUL	NULL	
	PaymentDate	datetime	YES		CURRENT_TIMESTAMP	DEFAULT_GENERATED
	Amount	decimal(10,2)	NO		NULL	
	PaymentMethod	varchar(50)	YES		NULL	
	PaymentStatus	varchar(20)	YES		Pending	

• Alter table : Modify column

Modify phone number type to varchar(20).

Alter table Customers modify PhoneNumber varchar(20);

	Field	Type	Null	Key	Default	Extra
•	CustomerID	int	NO	PRI	NULL	
	FirstName	varchar(50)	NO		NULL	
	LastName	varchar(50)	NO		NULL	
	gender	varchar(20)	YES		NULL	
	PhoneNumber	varchar(20)	YES		NULL	
	Email	varchar(100)	NO	UNI	NULL	

• Alter table : Rename column

Rename coumn from totalamount to new name ordertotal.

Alter table Orders rename column Totalamount to OrderTotal;

	Field	Type	Null	Key	Default	Extra
•	OrderID	int	NO	PRI	NULL	
	CustomerID	int	YES	MUL	NULL	
	OrderDate	datetime	YES		CURRENT_TIMESTAMP	DEFAULT_GENERATED
	OrderTotal	decimal(10,2)	NO		NULL	

• Alter table : rename table

Rename table name.

Alter table menuitems rename to Fooditems;

	Tables_in_restaurant
▶	customers
	employees
	fooditems
	menuitems
	orderitems
	orders
	payments
	reservations

• Alter table : Drop Column

Delete a single column within the data. alter table employees drop column salary;

	Field	Туре	Null	Key	Default	Extra
•	EmployeeID	int	NO	PRI	NULL	
	FirstName	varchar(50)	NO		NULL	
	LastName	varchar(50)	NO		NULL	
	Position	varchar(50)	NO		NULL	
	Salary	decimal(10,2)	NO		NULL	
	HireDate	datetime	YES		CURRENT_TIMESTAMP	DEFAULT_GENERATED

3. Truncate table:

Delete all the data in the table.

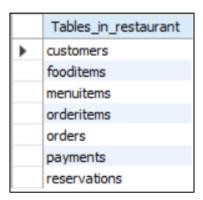
Truncate table Employees;

EmployeeID	FirstName	LastName	Position	Salary	HireDate
NULL	NULL	NULL	NULL	NULL	NULL

4.Drop Table:

Delete the table from the database.

Drop table Employees;



2.DATA MANIPULATION LANGUAGE(DML)

1.Insert:

Insert observation into Customers.

Insert into Customers (CustomerID, FirstName, LastName, gender, PhoneNumber, Email)

values(101, 'raj', 'patil', 'male', '9034567890', 'rajp@gmail.com');

	CustomerID	FirstName	LastName	gender	PhoneNumber	Email
١	101	Raj	Patil	Male	9034567890	rajp@gmail.com
	102	Janhavi	Smith	Female	NULL	janhavi@gmail.com
	103	Onkar	Bhosale	Male	9445678901	patilo@gmail.com
	104	Priya	Kadam	Female	7456789012	priya@gmail.com
	105	Charlie	Davis	Male	9567890123	charlie@gmail.com
	106	Dev	Bapat	Male	9678901234	dev@gmail.com
	107	Sam	Taylor	Male	7789012345	samtaylor@gmail.com
	108	Karan	Tata	Male	7890123456	karantata@gmail.com
	109	Ganesh	kumar	NULL	9035967890	ganeshkumar@gmail.com
	NULL	NULL	NULL	NULL	NULL	HULL

2. Update

Update Customer first name as Samarth whose id 107.

Update Customers set FirstName="samarth" where CustomerID=107;

	CustomerID	FirstName	LastName	gender	PhoneNumber	Email
١	101	Raj	Patil	Male	9034567890	rajp@gmail.com
	102	Janhavi	Smith	Female	NULL	janhavi@gmail.com
	103	Onkar	Bhosale	Male	9445678901	patilo@gmail.com
	104	Priya	Kadam	Female	7456789012	priya@gmail.com
	105	Charlie	Davis	Male	9567890123	charlie@gmail.com
	106	Dev	Bapat	Male	9678901234	dev@gmail.com
	107	samarth	Taylor	Male	7789012345	samtaylor@gmail.com
	108	Karan	Tata	Male	7890123456	karantata@gmail.com
	109	Ganesh	kumar	NULL	9035967890	ganeshkumar@gmail.com
	NULL	NULL	HULL	HULL	HULL	NULL

3. Delete

Delete record whose customer id is 109.

Delete from Customers where CustomerID=109;

	CustomerID	FirstName	LastName	gender	PhoneNumber	Email
Þ	101	Raj	Patil	Male	9034567890	rajp@gmail.com
	102	Janhavi	Smith	Female	NULL	janhavi@gmail.com
	103	Onkar	Bhosale	Male	9445678901	patilo@gmail.com
	104	Priya	Kadam	Female	7456789012	priya@gmail.com
	105	Charlie	Davis	Male	9567890123	charlie@gmail.com
	106	Dev	Bapat	Male	9678901234	dev@gmail.com
	107	samarth	Taylor	Male	7789012345	samtaylor@gmail.com
	108	Karan	Tata	Male	7890123456	karantata@gmail.com
	NULL	NULL	NULL	HULL	NULL	NULL

1.DATA QUERY LANGUAGE(DQL)

1. Select Query

1) Select Query for Entire Data.

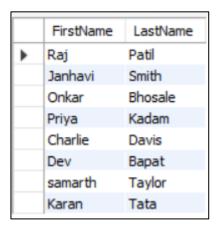
Select * from Customers;

	CustomerID	FirstName	LastName	gender	PhoneNumber	Email
١	101	Raj	Patil	Male	9034567890	rajp@gmail.com
	102	Janhavi	Smith	Female	NULL	janhavi@gmail.com
	103	Onkar	Bhosale	Male	9445678901	patilo@gmail.com
	104	Priya	Kadam	Female	7456789012	priya@gmail.com
	105	Charlie	Davis	Male	9567890123	charlie@gmail.com
	106	Dev	Bapat	Male	9678901234	dev@gmail.com
	107	samarth	Taylor	Male	7789012345	samtaylor@gmail.com
	108	Karan	Tata	Male	7890123456	karantata@gmail.com
	NULL	NULL	NULL	NULL	NULL	HULL

2) Select query with specific column

Find first name and last name of all customers.

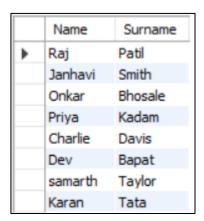
Select FirstName,LastName from Customers;



c) Select query with column name change

Find the information from tables by using our given name using alias.

Select FirstName as Name, LastName as Surname from Customers;



2.Order By

3) Order By query ASC

Find all Food Items order by price.

Select * from FoodItems order by price ASC;

	MenuItemID	ItemName	Price	Category
•	5	Samosa	30.00	Snacks
	7	Lassi	50.00	Beverage
	6	Gulab Jamun	80.00	Dessert
	4	Masala Dosa	100.00	Snacks
	3	Chole Bhature	150.00	Main Course
	8	Palak Paneer	200.00	Main Course
	1	Paneer Butter Masala	220.00	Main Course
	2	Chicken Biryani	300.00	Main Course
	NULL	NULL	NULL	NULL

4) Order By query DESC

Find all Food Items order by price.

Select * from FoodItems order by price DESC;

	MenuItemID	ItemName	Price	Category
•	2	Chicken Biryani	300.00	Main Course
	1	Paneer Butter Masala	220.00	Main Course
	8	Palak Paneer	200.00	Main Course
	3	Chole Bhature	150.00	Main Course
	4	Masala Dosa	100.00	Snacks
	6	Gulab Jamun	80.00	Dessert
	7	Lassi	50.00	Beverage
	5	Samosa	30.00	Snacks
	NULL	NULL	NULL	NULL

5) Order by column

Find all customers order by CustomerID then ReservationDate

Select * from Reservations order by customerID ,ReservationDate;

	ReservationID	CustomerID	ReservationDate	NumberOfPeople
•	1	101	2024-10-25 19:00:00	2
	2	102	2024-10-26 20:00:00	4
	3	103	2024-10-27 18:30:00	3
	4	104	2024-10-28 20:00:00	5
	5	105	2024-10-29 19:30:00	2
	6	106	2024-10-30 18:00:00	6
	7	107	2024-10-31 19:00:00	4
	8	108	2024-11-01 20:30:00	3
	NULL	NULL	NULL	NULL

3.Limit Query

find first 5 customers from the table.

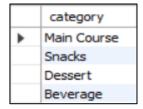
Select * from Customers Limit 5;

	CustomerID	FirstName	LastName	gender	PhoneNumber	Email
•	101	Raj	Patil	Male	9034567890	rajp@gmail.com
	102	Janhavi	Smith	Female	NULL	janhavi@gmail.com
	103	Onkar	Bhosale	Male	9445678901	patilo@gmail.com
	104	Priya	Kadam	Female	7456789012	priya@gmail.com
	105	Charlie	Davis	Male	9567890123	charlie@gmail.com
	NULL	NULL	NULL	NULL	NULL	NULL

4.Distinct Query

Find all the diffrent food categories in the table

Select Distinct category from FoodItems;



5.WHERE Clause

1) With comparison operators

Find all Snacks food items.

Select * from FoodItems where Category="Snacks";

	MenuItemID	ItemName	Price	Category
•	4	Masala Dosa	100.00	Snacks
	5	Samosa	30.00	Snacks
	HULL	NULL	HULL	HULL

find all the pending payment information

Select * from payments where PaymentStatus="Pending";

	PaymentID	OrderID	PaymentDate	Amount	PaymentMethod	PaymentStatus
•	4	204	2024-10-24 11:45:34	100.00	Debit Card	Pending
	7	207	2024-10-24 11:45:34	150.00	UPI	Pending
	NULL	NULL	NULL	NULL	NULL	NULL

Find the Food items whose price is greater than 100rs.

Select MenuItemID, ItemName, Price from FoodItems where price > 100;

	MenuItemID	ItemName	Price
•	1	Paneer Butter Masala	220.00
	2	Chicken Biryani	300.00
	3	Chole Bhature	150.00
	8	Palak Paneer	200.00
	NULL	NULL	NULL

2) Using Logical Operators

a) AND Operator

Display customers who have a phone no. is null and surname='smith'.

Select * from Customers where LastName='smith' and PhoneNumber is null;

	CustomerID	FirstName	LastName	gender	PhoneNumber	Email
•	102	Janhavi	Smith	Female	NULL	janhavi@gmail.com
	NULL	NULL	NULL	NULL	NULL	NULL

b) OR Operator

Find food items that are either in the "Snacks" category or have a price greater than 150.

Select category, price from fooditems where Category = 'Snacks' OR Price > 150;

	category	price
•	Main Course	220.00
	Main Course	300.00
	Snacks	100.00
	Snacks	30.00
	Main Course	200.00

c) NOT Operator

Find all orders that are not marked as "Completed".

Select * from Payments where not PaymentStatus = 'Completed';

	PaymentID	OrderID	PaymentDate	Amount	PaymentMethod	PaymentStatus
•	4	204	2024-10-24 11:45:34	100.00	Debit Card	Pending
	7	207	2024-10-24 11:45:34	150.00	UPI	Pending
	NULL	NULL	NULL	NULL	NULL	NULL

4.IN operators

Find all orders with OrderID in a specific set of values.

Select * from Orders where OrderID in (201, 202, 203);

	OrderID	CustomerID	OrderDate	OrderTotal
•	201	101	2024-10-24 11:45:27	220.00
	202	102	2024-10-24 11:45:27	300.00
	203	103	2024-10-24 11:45:27	150.00
	HULL	NULL	NULL	NULL

5.ANY operator

Display customer ID and amount from orders who spends greater than 150rs.

Select CustomerID,OrderTotal as Amount from Orders

where ordertotal>any(select ordertotal from orders where ordertotal>=150);

	customerid	ordertotal
•	101	220.00
	102	300.00
	108	200.00

6.All operator

To fetch food name whose menu price is less than price of all customers menu whose category is main course.

Select itemname as Menu, price from fooditems Where

price<all(Select price from Fooditems where category="main course");

	Menu	price
•	Masala Dosa	100.00
	Samosa	30.00
	Gulab Jamun	80.00
	Lassi	50.00

7. BETWEEN Operator

Find all food items with prices between 100 and 300.

Select * from Fooditems where price between 100 and 300;

	MenuItemID	ItemName	Price	Category
•	1	Paneer Butter Masala	220.00	Main Course
	2	Chicken Biryani	300.00	Main Course
	3	Chole Bhature	150.00	Main Course
	4	Masala Dosa	100.00	Snacks
	8	Palak Paneer	200.00	Main Course
-	NULL	NULL	NULL	NULL

8. Combination of AND & OR operator

Display records whose either amount greater than 200 or payment status completed and payment method credit .

Select*from Payments where (PaymentStatus='Completed' and PaymentMethod='Credit Card') or Amount>200;

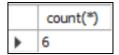
	PaymentID	OrderID	PaymentDate	Amount	PaymentMethod	PaymentStatus
Þ	1	201	2024-10-24 11:45:34	220.00	Credit Card	Completed
	2	202	2024-10-24 11:45:34	300.00	Cash	Completed
	3	203	2024-10-24 11:45:34	300.00	UPI	Completed
	6	206	2024-10-24 11:45:34	80.00	Credit Card	Completed
	NULL	HULL	NULL	HULL	HULL	NULL

6.Aggregate Functions

a. Count function

display total number of customers

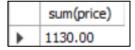
Select count(*) from Payments where PaymentStatus='Completed';



b. sum function

Display total price of all food items.

Select sum(price) from Fooditems;



c. Average

Display average amount of orders.

Select round(avg(OrderTotal),2) as Average amount of orders from Orders;

	Average_amount_of_orders	
•	141.25	

d.max,min Functions

To fetch menu and price which having highest price.

Select ItemName, Price from Fooditems where price=(select max(Price) from Fooditems);

	Itemname	price
•	Chicken Biryani	300.00

Display lowest price of menu.

Select min(price) as Lowest_Price from FoodItems;



7. Group by clauses

Display total amount grouped by payment Status.

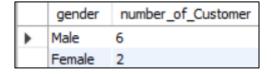
Select PaymentStatus, sum(amount) as TotalAmount from Payments group by PaymentStatus;

	PaymentStatus	TotalAmount
•	Completed	1130.00
	Pending	250.00

Display number of orders for each customer.

Select gender,count(customerID) as number_of_customer from Customers

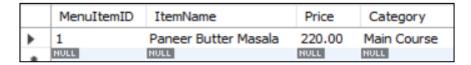
group by gender;



8.LIKE Operator

Find Food Items That End With 'Masala'

Select * from Fooditems where ItemName like '%masala';



Display customerid and full name of customer whose last name contains exactly five characters.

Select CustomerID,concat(FirstName," ",LastName) as FullName from Customers where LastName like ' ';

	customerid	FullName
•	101	Raj Patil
	102	Janhavi Smith
	104	Priya Kadam
	105	Charlie Davis
	106	Dev Bapat

Find payments having methods contain 'card'.

Select * from Payments where PaymentMethod like ' card';

	PaymentID	OrderID	PaymentDate	Amount	PaymentMethod	PaymentStatus
•	1	201	2024-10-24 11:45:34	220.00	Credit Card	Completed
	6	206	2024-10-24 11:45:34	80.00	Credit Card	Completed
	NULL	NULL	NULL	NULL	NULL	NULL

9.union

Union of payments made by cash and credit card

Select PaymentID, OrderiID, Amount, PaymentMethod

from Payments

where paymentmethod = 'cash'

Union

Select PaymentID, OrderID, Amount, PaymentMethod

from Payments

where PaymentMethod = 'credit card';

	PaymentID	OrderID	Amount	paymentmethod
•	2	202	300.00	Cash
	5	205	30.00	Cash
	8	208	200.00	Cash
	1	201	220.00	Credit Card
	6	206	80.00	Credit Card

Union of orders and payments with specific status and amounts.

Select OrderID, OrderTotal as Amount

from Orders

where OrderTotal > 100

Union

Select OrderID, Amount

from Payments

where Amount > 100 and PaymentStatus = 'Completed';

	OrderID	Amount
•	201	220.00
	202	300.00
	203	150.00
	208	200.00
	203	300.00

10.Join

4 Inner Join

List food items with their price and ordered quantity.

Select f.itemname, f.price as price_per_item, o.quantity

from Fooditems f

Inner join Orderitems o

on f.menuitemid = o.menuitemid;

	ItemName	price_per_item	Quantity
•	Paneer Butter Masala	220.00	1
	Chicken Biryani	300.00	1
	Chole Bhature	150.00	2
	Masala Dosa	100.00	3
	Samosa	30.00	2
	Gulab Jamun	80.00	2
	Lassi	50.00	3
	Palak Paneer	200.00	1

Right Join

Display all orders and their associated customers.

Select c.firstname, c.lastname, o.orderid, o.orderdate

from orders o

Right join customers c on o.customerid = c.customerid;

	FirstName	LastName	OrderID	OrderDate
•	Raj	Patil	201	2024-10-24 11:45:27
	Janhavi	Smith	202	2024-10-24 11:45:27
	Onkar	Bhosale	203	2024-10-24 11:45:27
	Priya	Kadam	204	2024-10-24 11:45:27
	Charlie	Davis	205	2024-10-24 11:45:27
	Dev	Bapat	206	2024-10-24 11:45:27
	samarth	Taylor	207	2024-10-24 11:45:27
	Karan	Tata	208	2024-10-24 11:45:27

11.Subqueries

1. Single row subquery

Find the most expensive menu item.

Select Itemname, price

from fooditems

where price = (select max(Price) from fooditems);

	ItemName	Price
•	Chicken Biryani	300.00

Find food items whose prices above average price.

Select ItemName, Price

from fooditems

where Price > (select avg(Price) from Fooditems);

	ItemName	Price
•	Paneer Butter Masala	220.00
	Chicken Biryani	300.00
	Chole Bhature	150.00
	Palak Paneer	200.00

2. Multiple row subquery

List orders with payments pending.

Select OrderID, CustomerID, OrderTotal

from Orders

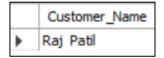
where Orderid in (Select OrderID from Payments where PaymentStatus = 'Pending');

	OrderID	CustomerID	ordertotal
•	204	104	100.00
	207	107	50.00
	NULL	NULL	NULL

To find customer full name who have second highest bill in restaurant.

Select concat(FirstName," ",LastName) as customer name from Customers

where CustomerID=(Select CustomerID from Orders where OrderTotal=(Select max(OrderTotal) from Orders where OrderTotal<(Select max(OrderTotal) from Orders)));



12.view

Create view of Item name, price and category of foodmenu.

Select ItemName, Price, Category

from Fooditems;

Select*from Foodmenu;

	ItemName	Price	Category
•	Paneer Butter Masala	220.00	Main Course
	Chicken Biryani	300.00	Main Course
	Chole Bhature	150.00	Main Course
	Masala Dosa	100.00	Snacks
	Samosa	30.00	Snacks
	Gulab Jamun	80.00	Dessert
	Lassi	50.00	Beverage
	Palak Paneer	200.00	Main Course