King Saud University
College of Business Administration
Management Information Systems Department

MIS 214- Introduction to Databases
2nd Semester 2024

Database of Entrecôte café de Paris Restaurant

Milestone#1- Project Proposal

Section #	Name	ID
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Project Description

Our database project will revolve around the world-renowned restaurant, Entrecôte café de Paris. The restaurant opened in Geneva, Switzerland in 1930. Since then, the restaurant offered a variety of unique gourmet dishes, alongside their most distinguished French dishes. The captivating atmosphere always aims towards the best experience for our targeted view, which is the customers.

View Description

Customers can view and update their contact details, including their name, email, phone number, and address, ensuring that the restaurant has up-to-date information. Additionally, customers can easily make any special requests they might have, such as a reservation for their birthday. Customers can also view available dietary choices. The view also grants customers the ability to see their order history, providing a comprehensive list of previous orders, along with the order dates and the electronic receipt of the order. Furthermore, customers can see their reservation history, including reservation dates, allowing them to keep track of their past visits and plan future dining experiences accordingly. The customer view empowers customers by offering a user-friendly interface that enables them to effortlessly access and review their personal information, reservation history, reservation status, special requests for reservations, menu items, and order history, ultimately enhancing their overall experience.

Data Requirements

The customer view has the following data requirements:

- Customer
  A customer is the person visiting or receiving services at the restaurant. Each customer has a unique customer number, date of birth, address (city, neighborhood), name (first name, last name), contact information (phone number, email address), and any possible dietary restrictions (vegetarian, gluten-free, or other specific dietary restrictions).

- Branch

  A customer can visit many branches, and a branch can be visited by multiple customers. Each branch has a unique branch number, address (city, neighborhood, street), phone numbers (up to a maximum of three), reservation capacity (each branch can have up to a maximum of fifty reservations a day).

- Reservations

  A customer can book many reservations, while a reservation can only be booked by one customer. A reservation is made only for one branch while a branch can have multiple reservations. Each reservation has a unique reservation number, table number, date of reservation, time of reservation, number of guests (a minimum of one and a maximum of ten), reservation status (confirmed or cancelled only), and any special requests the customer might have (celebrations (of any kind), or none).

- Receipts

  A customer can have multiple receipts, while a receipt can only be issued to one customer. A receipt can be issued by one branch while a branch can issue many receipts. A receipt can have one order and an order can have one receipt. Each receipt has a unique receipt number, date of receipt, time of receipt, total amount, payment method (cash or credit card), and every receipt has an electronic version available for viewing for the customer.

- Orders

  A customer can place many orders, while an order is only placed by one customer. An order can be taken by multiple staff members and a staff member can only take one order. Each order has a unique order number, data of order, time of order, and items ordered (can have a minimum of one item and a maximum of ten items).

- Staff

    A customer can interact with multiple staff members, and staff members can interact with multiple customers. A staff member can only work in one branch, but a branch can have multiple staff members. Each staff member has a unique staff number, name (first name, middle name, last name), role (waiter, supervisor, manager, cashier, host only), shift (day shift or night shift only), gender, date of birth, contact information (phone number, email address), joining date, salary, address (city, neighborhood, street). A staff member is supervised by one supervisor while a supervisor can supervise multiple staff members.

- Reviews

    A customer can leave many reviews, while only one review is left by a customer. Each review has a unique review number, rating (minimum of one star maximum of five stars), date of review, time of review.

Transaction Requirements
Data Entry

Insert customer personal information.

 (Customer name, address, date of birth, contact information (phone number, email), dietary restrictions (if they have any))

E.g. (Sara Ahmed Al-otaibi, (Riyadh, Al-Olaya) ,27/8/2003, 05xxxxxxxx, Sara@gmail.com, None)

Insert date, time, and the branch name of reservation.

E.g. (4:PM ,27/8/2024, branch Al-Faisaliya tower)

Insert customer review.

(Branch name, Rating)

E.g. (Branch Laysen Valley branch, five stars)

Data Update/Deletion

Update/delete customer personal information.

E.g. (Update phone number, delete address information)

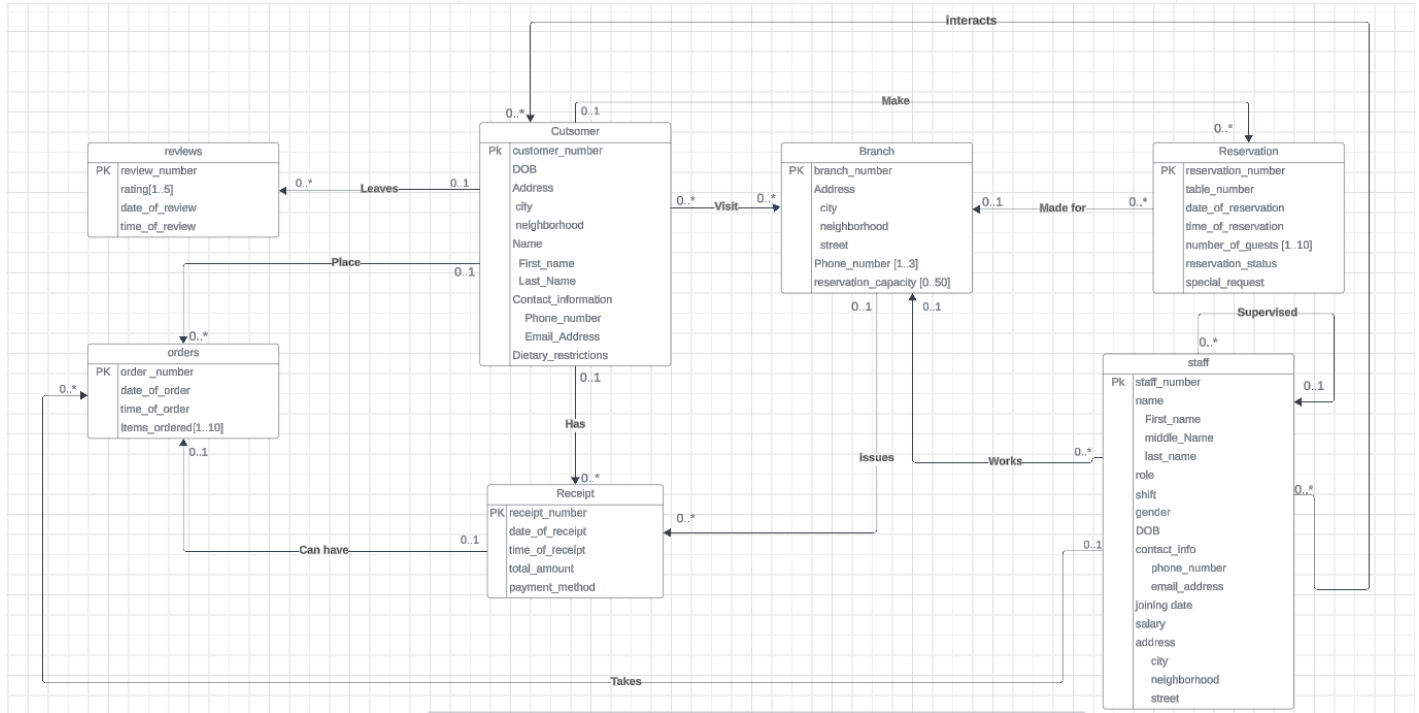Update/ delete a reservation.

E.g. (update the date of reservation)

Update/ delete a review.

(Delete the review)

Data Queries

- View customer personal information.
- List the menu items.
- List the most ordered items from the menu.
- List reviews from all branches of the restaurant.
- View vegan menu items.
- View gluten-free menu items.
- List the available reservations in each branch.
- View customer reservation history.
- View customers reservation status.
- View seating capacity for each reservation.
- View electronic receipts.
- View order history.

Enhanced Entity Relationship Diagram (EER)

Relational Schema

Customer entity:
Customer (<u>customer_number</u>, DOB, city, neighborhood, first_name, last_name, phone_number, email_address, dietary_restrictions)

Branch entity:
Branch (<u>branch_number</u>, city, neighborhood, street)

Branch Phone number (<u>branch_number, phone_number</u>)
Foreign key branch_number references Branch (branch_number)

Branch reservation capacity (<u>branch_number, reservation_capacity</u>)
Foreign key branch_number references Branch (branch_number)

Visit (<u>customer_number, branch_number</u>)
Foreign key customer_number references Customer (customer_number)
Foreign key branch_number references Branch (branch_number)

Reservation entity:
Reservation (<u>reservation_number</u>, table_number, date_of_reservation, time_of_reservation, status_of_reservation, special_requests, <u>customer_number, branch_number</u>)
Foreign key customer_number references Customer (customer_number)
Foreign key branch_number references Branch (branch_number)

Reservation number of guests (<u>reservation_number, number_of_guests</u>)
Foreign key reservation_number references Reservation (reservation_number)

Receipt entity:
Receipt (<u>Receipt_number</u>, Date_of_receipt, Time_of_receipt, Total_amount, Payment_method, <u>branch_number</u>, <u>customer_number</u>)
Foreign key branch_number references Branch (branch_number)
Foreign key customer_number references Customer (customer_number)

Staff entity:
Staff (<u>staff_number,</u> first_name, middle_name, last_name, role, shift, gender, DOB, phone_number, Email_address, joining date, salary, city, neighborhood, street, <u>branch_number,</u> <u>supervisor_number</u>)

Foreign key branch_number references Branch (branch_number)
Foreign key supervisor_number references Staff (staff_number)

Interacts (customer_number, staff_number)
Foreign key customer_number references Customer (customer_number)
Foreign key staff_number references Staff (staff_number)

Orders entity:
Orders (Order_number, Date_of_order, Time_of_order, receipt_number, customer_number, staff_number)
Foreign key receipt_number references Receipt (receipt_number)
Foreign key customer_number References Customer (customer_number)
Foreign key staff_number references Staff (staff_number)

Items ordered (order_number, items_ordered)
Foreign key order_number references Orders (order_number)

Review Entity:
Reviews (review_number, date_of_review, time_of_review, customer_number)
Foreign key customer_number references Customer (customer_number)

Review Rating (review_number, rating)
Foreign key review_number references Review (review_number)

Data Dictionary Showing Description of All Entities

Entity Name	Description
Customer	The person visiting or receiving the service at the restaurant.
Branch	Refers to a secondary location of a larger establishment. That is under the control of the main organization but operates semi-autonomously.
Staff	A group of individuals collectively employed or engaged to perform various tasks or duties within an organization, institution, or establishment, typically under the direction of management or leadership
Receipt	electronic or printed paper proving that a transaction happened between the branch and the customer, the receipt provides transaction details such as date and time, payment methods, and total amount.
Orders	Orders are records of customer purchases, including unique order numbers, dates and times of purchase, customer identification, and lists of items bought.
Reservation	Refers to a system for managing appointments.
Review	The notes left by the customer expressing their opinion regarding the service provided.
Branch phone number	The branch number alongside the phone numbers the branch has.
Branch reservation capacity	Refers to the capacity of each branch to have reservations.
Visit	The customer number alongside the branch they might visit.
Reservation number of guests	The reservation number alongside the number of guests per reservation.
Items ordered	The order number with the number of items ordered.
Interacts	Refers to the customer and the staff member who interact.
Review rating	Refers to the rating of each review.

Data Dictionary Showing Description of All Relationships

Entity Name	Multiplicity	Relationship	Entity Name	Multiplicity
Reservation	0..*	Made for	Branch	0..1
Branch	0..1	Issues	Receipt	0..*
Customer	0..1	Leaves	Review	0..*
Customer	0..1	Has	Receipt	0..*
Customer	0..1	Place	Order	0..*
Customer	0..1	Make	Reservation	0..*
Customer	0..*	Visit	Branch	0..*
Receipt	0..1	Has	Orders	0..1
Staff	0...*	Supervised	Staff	0..1
Staff	0..*	Works at	Branch	0..1
Staff	0..*	Interacts	Customer	0..*
Staff	0..1	Takes	Orders	0..*

Data Dictionary Showing Description of All Attributes

Entity Name	Attribute	Description	Data Type	Length	Nulls	Multi-Valued	Default Value	Range	CK	PK
Customer	Customer number	Number that uniquely identifies the customer	Char	10	N	N	N	N	Y	Y
	Date Of Birth	The date the customer was born	Date	N	N	N	N	N	N	N
	City	The city the customer lives in	varchar	255	N	N	'Riyadh'	N	N	N
	Neighborhood	The neighborhood the customer resides in	varchar	255	Y	N	N	N	N	N
	First name	Customers first name	Varchar	255	N	N	N	N	N	N
	Last name	Customers last name	Varchar	255	N	N	N	N	N	N
	Email address	Customers email	Varchar	255	Y	N	N	N	N	N
	Phone number	Customers phone number	Char	10	N	N	N	N	N	N
	Dietary restrictions	The dietary preference for the	Varchar	255	Y	N	N	N	N	N

Entity	Attribute	Description	Type	Length						
		customer s								
Branch	Branch number	Identifies the unique branch number.	CHAR	10	N	N	N	N	Y	Y
	City	City of the branch.	varchar	255	N	N	'Riyadh'	N	N	N
	Neighbor hood	Neighborhood of the branch.	varchar	255	N	N	N	N	N	N
	Street	Street the branch is on.	varchar	255	N	N	N	N	N	N
Branch phone number	Branch number	Identifies the unique branch number.	Char	10	N	N	N	N	Y	Y
	Phone number.	The branches phone number	Char	10	N	1 .. 3	N	N	Y	Y
Branch reservation capacity	Branch number	Identifies the unique branch number.	Char	10	N	N	N	N	Y	Y
	Reservati on capacity	Capacity for reservati ons in a branch	Num eric	2	N	0 .. 5 0	N	N	Y	Y
Visit	Custome r number	Number that uniquely identifies the customer	Char	10	N	N	N	N	Y	Y
	Branch number	Identifies the unique branch number.	Char	10	N	N	N	N	Y	Y

Entity	Attribute	Description	Data type	Size							
Reservation	Reservation number	Identifies the unique reservation number.	CHAR	10	N	N	N		N	Y	Y
	Table number	The unique table number	CHAR	10	N	N	N		N	Y	N
	Date of reservation	The date of the reservation	DATE	N	N	N	N		N	N	N
	Time of reservation	The time of the reservation	TIME	N	N	N	N		N	N	N
	Reservation status	The status of the reservation	char	10	N	N	N	'Confirmed 'or 'Cancelled'	N		N
	Special requests	Certain requests a customer might have for a reservation	VARCHAR	255	Y	N	N	Description of the request, like a 'birthday' for example.	N		N
	Customer number	Number that uniquely identifies the customer	Char	10	N	N	N		N	N	N
	Branch number	Identifies the unique branch number.	Char	10	N	N	N		N	N	N
Reservation number of guests	Reservation number	Identifies the unique reservation number.	Char	10	N	N	N		N	Y	Y

Entity	Attribute Name	Description	Data Type	Length				Constraint			Primary Key
	Number of guests	Number of guests per reservation	Numeric	2	N	1..10	N		N	Y	Y
Receipt	Receipt number	It's a unique number used as an identifier.	Char	10	N	N	N		N	Y	Y
	Date of receipt	The date when the receipt is issued.	Date	N	N	N	N		N	N	N
	Time of receipt	The time when the receipt issued.	Date	N	N	N	N		N	N	N
	Total amount	The total amount of the order.	Numeric	8, 2	N	N	N		N	N	N
	payment method	The payment method the customer chooses to pay with.	Char	15	N	N	N	'Cash'or' Credit-card'	N		N
	Customer number	Number that uniquely identifies the customer	Char	10	N	N	N		N	N	N
	Branch number	Identifies the unique branch number.	Char	10	N	N	N		N	N	N
orders	Order number	Number that identifies the unique order number.	Char	10	N	N	N		N	Y	Y

Entity	Attribute	Description	Data Type	Size							
	Date of order	The date of the order.	Date	N	N	N	N		N	N	N
	Time of order	The time of the order	Time	N	N	N	N		N	N	N
	Receipt number	It's a unique number used as an identifier.	Char	10	N	N	N		N	N	N
	Customer number	Number that uniquely identifies the customer	Char	10	N	N	N		N	N	N
	Staff number	Number that uniquely identifies staff.	Char	10	N	N	N		N	N	N
Items ordered	Order number	Number that identifies the unique order number.	Char	10	N	N	N		N	Y	Y
	Items ordered	The number of items ordered	Numeric	2	N	1..10	N		N	Y	Y
Staff	Staff number	Number that uniquely identifies staff.	Char	10	N	N	N		N	Y	Y
	First name	First name of staff member	Varchar	255	N	N	N		N	N	N
	Middle name	Middle name of staff	Varchar	255	Y	N	N		N	N	N
	Last name	Last name of staff	Varchar	255	N	N	N		N	N	N
	Role	The role of staff member	Varchar	255	N	N	N	'waiter', 'supervisor', 'manager', 'cashier', 'host'	N		N

Entity	Attribute	Description	Data type	Length						
	Shift	When staff member works	varchar	5	N	N	N	'day' or 'night'	N	N
	Gender	What their gender is	Char	1	N	N	N	'F'or 'M'	N	N
	Date of birth	when they were born	Date	N	N	N	N		N	N
	Phone number	Staffs phone number	Char	10	N	N	N		N	N
	Email address	Staffs email	Varchar	255	Y	N	N		N	N
	Joining date	When they started working	Date	N	N	N	N		N	N
	Salary	What their compensation is.	Int	N	N	N	N		N	N
	City	What city they live in.	Varchar	255	N	N	'Riyadh'	N	N	N
	Neighborhood	What neighborhood they reside in.	Varchar	255	Y	N	N		N	N
	Street	The street of the neighborhood they live in.	Varchar	255	Y	N	N		N	N
	Branch number	Identifies the unique branch number.	Char	10	N	N	N		N	N
	Supervisor number	Number that uniquely identifies the staff who's a supervisor	char	10	N	N	N		N	N
Interacts	Customer number	Number that uniquely identifies the customer	Char	10	N	N	N		N	Y	Y
	Staff number	Number that uniquely identifies staff.	Char	10	N	N	N		N	Y	Y

Entity	Attribute	Description	Type	Length							
Reviews	Review number	Number that uniquely identifies the review number.	Char	10	N	N	N		N	Y	Y
	Date of review	The date when the review was written	Date	N	N	N	N		N	N	N
	Time of review	The time when the review was written	Time	N	N	N	N		N	N	
	Customer number	Number that uniquely identifies the customer	Char	10	N	N	N		N	N	N
Review rating	Review number	Number that uniquely identifies the review number.	Char	10	N	N	N		N	Y	Y
	Rating	The rating of the restaurant, left on the review.	Numeric	1	N	1 .. 5	N		N	Y	Y

Normalization (to 3NF)

Customer (<u>customer_number</u>, DOB, city, neighborhood, first_name, last_name, phone_number, email_address, dietary_restrictions)
- Each intersection of rows and columns has only one value, therefore the relation is 1NF.
- The relation is in 1NF, and there are no partial dependencies which makes it's in 2NF.
- The relation is in 2NF, and there are no transitive dependencies, so the relation is in 3NF.

Branch (<u>branch_number</u>, city, neighborhood, street)
- Each intersection of row and columns has only one value, therefore the relation is in 1NF.
- The relation is in 1NF, and there are no partial dependencies, so it is in 2NF.
- The relation is in 2NF, and there are no transitive dependencies, so the relation is in 3NF.

Staff (<u>staff_number,</u> first_name, middle_name, last_name, role, shift, gender, DOB, phone_number, Email_address, joining date, salary, city, neighborhood, street, <u>branch_number</u>, <u>supervisor_number</u>)
Foreign key branch_number references Branch (branch_number)
Foreign key supervisor_number references Staff (staff_number)

- Each intersection of rows and columns has only one value, therefore the relation is in 1NF.
- The relation is in 1NF, and there are no partial dependencies, so it's in 2NF.
- The relation is in 2NF, but there is a transitive dependency between role and staff, thus it's not in 3NF.

Staff (<u>staff_number,</u> first_name, middle_name, last_name, role, shift, gender, DOB, phone_number, Email_address, joining date, city, neighborhood, street, <u>branch_number</u>, <u>supervisor_number</u>)
Staff salary (<u>role</u>, salary)

Branch Phone number (<u>branch_number, phone_number</u>)
Foreign key branch_number references Branch (branch_number)

- Each intersection of rows and columns has only one value, therefore the relation is in 1NF.
- The relation is in 1NF, and there are no partial dependencies, so it's in 2NF.
- The relation is in 2NF, and there are no transitive dependencies, so the relation is in 3NF.

Branch reservation capacity (<u>branch_number, reservation_capacity</u>)
Foreign key branch_number references Branch (branch_number)

- Each intersection of rows and columns has only one value, therefore the relation is in 1NF.
- The relation is in 1NF, and there are no partial dependencies, so it's in 2NF.
- The relation is in 2NF, and there are no transitive dependencies, so it's in 3NF.

Visit (<u>customer_number, branch_number</u>)
Foreign key customer_number references Customer (customer_number)

Foreign key branch_number references Branch (branch_number)

- Each intersection of rows and columns has only one value, therefore the relation is in 1NF.
- The relation is in 1NF, and there are no partial dependencies, so it's in 2NF.
- The relation is in 2NF, and there are no transitive dependencies, so it's 3NF.

Reservation number of guests (reservation_number, number_of_guests)

Foreign key reservation_number references Reservation (reservation_number)

- Each intersection of rows and columns has only one value, therefore the relation is in 1NF.
- The relation is in 1NF, and there are no partial dependencies, so it's in 2NF.
- The relation is in 2NF, and there are no transitive dependencies, so it's 3NF.

Items ordered (order_number, items_ordered)
Foreign key order_number references Orders (order_number)

- Each intersection of rows and columns has only one value, therefore the relation is in 1NF.
- The relation is in 1NF, and there are no partial dependencies, so it's in 2NF.
- The relation is in 2NF, and there are no transitive dependencies, so it's 3NF.

Interacts (customer_number, staff_number)
Foreign key customer_number references Customer (customer_number)
Foreign key staff_number references Staff (staff_number)

- Each intersection of rows and columns has only one value, therefore the relation is in 1NF.
- The relation is in 1NF, and there are no partial dependencies, so it's in 2NF.
- The relation is in 2NF, and there are no transitive dependencies, so it's 3NF.

Review Rating (review_number, rating)
Foreign key review_number references Review (review_number)

- Each intersection of rows and columns has only one value, therefore the relation is in 1NF.
- The relation is in 1NF, and there are no partial dependencies, so it's in 2NF.
- The relation is in 2NF, and there are no transitive dependencies, so it's 3NF.

Receipt (Receipt_number, Date_of_receipt, Time_of_receipt, Total_amount, Payment_method, branch_number, customer_number)
Foreign key branch_number references Branch (branch_number)
Foreign key customer_number references Customer (customer_number)

- Each intersection of rows and columns has only one value, therefore the relation in the 1NF.
- The relation is in 1NF, and there are no partial dependencies so it's in 2NF.
- The relation is in 2NF, and there are no transitive dependencies so it's in 3NF.

Orders (Order_number, Date_of_order, Time_of_order, receipt_number, customer_number, staff_number)
Foreign key receipt_number references Receipt (receipt_number)
Foreign key customer_number References Customer (customer_number)

Foreign key staff_number references Staff (staff_number)

- Each intersection of rows and columns has only one value, therefore the relation in the 1NF.
- The relation is in 1NF, and there are no partial dependencies so it's in 2NF.
- The relation is in 2NF, and there are no transitive dependencies so it's in 3NF.

Reviews (review_number, date_of_review, time_of_review, customer_number)

Foreign key customer_number references Customer (customer_number).

− Each intersection of rows and columns has only one value, therefore the relation is in 1NF.
− The relation is in 1NF, and there are no partial dependencies which makes it in 2NF.
− The relation is in 2NF, and there are no transitive dependencies, so the relation is in 3NF.

Reservation(reservation_number,table_number,date_of_reservation,time_of_reservation,status_of_reservation, special_requests, customer_number, branch_number)

Foreign key customer_number references Customer (customer_number).

Foreign key branch_number references Branch (branch_number).

− Each intersection of rows and columns has only one value, therefore the relation is in 1NF.
− The relation is in 1NF, and there are no partial dependencies which makes it in 2NF.
− The relation is in 2NF, and there are no transitive dependencies, so the relation is in 3NF.

Work Distribution

Name	ID	Percentage	Work
Aljoharah Adel Alsulami	443202090	100%	-Data Requirements -Branch entity eer -Reservation entity eer -Branch entity mapping -Reservation entity mapping -Edited all entities in the relational schema - Edited all data dictionary tables. -Normalization: branch phone number, branch reservation capacity, visit, reservation number of guests, items ordered, staff ,interacts and review rating.
Aseel Ahmed Alsaeed	443202167	100%	-Data entry -Data update/ deletion -Receipts entity eer -Receipt entity mapping Normalization: receipt, order.
Kholoud Ahmed ALmusitir	443201545	100%	-Project Description -Customer entity eer -Customer entity mapping -Review entity mapping
Raneem abdulaziz alfadda	443200981	100%	-Data Queries -Staff entity eer -Orders entity err
Jawaher bindalak	443201720	100%	-View Description -Reviews entity eer -Orders entity mapping