

ERD Explanation

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Overview of the ERD

The diagram represents a **restaurant management system**, detailing how customers, employees, orders, payments, inventory, suppliers, reservations, and menu items interact within the system.

Key Entities and Their Attributes

1. Customers

- **Attributes:** Customer_ID, First_Name, Last_Name, DOB, Gender, Contact_Number, Email
- **Relationships:**
 - A customer can have multiple **addresses** (Customer_Addresses).
 - A customer can make multiple **reservations** (Reservations).
 - A customer can place multiple **orders** (Orders).

2. Customer_Addresses

- **Attributes:** Address_ID, Customer_ID_FK, Address_Line1, Address_Line2, City, State, ZIP_Code
- **Relationships:**
 - Each address belongs to a single customer.
 - One customer can have multiple addresses.

3. Employees

- **Attributes:** Employee_ID, First_Name, Last_Name, Role, Contact_Number, Email, Salary, Hire_Date
- **Relationships:**
 - Employees handle **orders** (Orders).
 - Employees have different **roles** (e.g., waiter, cashier, chef).

4. Orders

- **Attributes:** Order_ID, Customer_ID_FK, Employee_ID_FK, Order_Date, Order_Time, Total_Amount, Payment_Status, Order_Status
- **Relationships:**
 - A customer **places** orders.
 - An employee **handles** orders.
 - Each order has multiple **order items** (Order_Items).
 - Each order is linked to a **payment** (Payments).

5. Payments

- **Attributes:** Payment_ID, Order_ID_FK, Amount_Paid, Payment_Date, Payment_Mode
 - **Relationships:**
 - Each payment belongs to a single **order**.
 - An order can have multiple payment records (e.g., split payments).
6. **Order_Items**
- **Attributes:** OrderItem_ID, Order_ID_FK, Item_ID_FK, Quantity, Item_Price
 - **Relationships:**
 - Each order can contain multiple **menu items** (Menu_Items).
7. **Menu_Items**
- **Attributes:** Item_ID, Category_ID_FK, Item_Name, Description, Price, Availability_Status
 - **Relationships:**
 - Each menu item belongs to a **menu category** (Menu_Categories).
 - Each menu item can be part of multiple **orders**.
8. **Menu_Categories**
- **Attributes:** Category_ID, Category_Name, Description
 - **Relationships:**
 - Categories classify multiple **menu items**.
9. **Reservations**
- **Attributes:** Reservation_ID, Customer_ID_FK, Reservation_Date, Reservation_Time, Category, Number_Of_People, Status, Special_Request
 - **Relationships:**
 - A customer can **make** multiple reservations.
10. **Suppliers**
- **Attributes:** Supplier_ID, Supplier_Name, Contact_Number, Email, Address, Product_Category
 - **Relationships:**
 - A supplier **provides** inventory items.
11. **Inventory**
- **Attributes:** Inventory_ID, Supplier_ID_FK, Item_Name, Category, Quantity, Purchase_Date
 - **Relationships:**
 - An inventory item is **linked to a supplier**.

Detailed Relationship Explanation

1. Customers & Customer_Addresses (1:M)

- A **customer** can have **multiple addresses**.
- Customer_Addresses.Customer_ID_FK links to Customers.Customer_ID.

2. Customers & Reservations (1:M)

- A **customer** can make **multiple reservations**.
- Reservations.Customer_ID_FK links to Customers.Customer_ID.

3. Customers & Orders (1:M)

- A **customer** can place **multiple orders**.
- `Orders.Customer_ID_FK` links to `Customers.Customer_ID`.

4. Employees & Orders (1:M)

- An **employee** (e.g., waiter) handles **multiple orders**.
- `Orders.Employee_ID_FK` links to `Employees.Employee_ID`.

5. Orders & Payments (1:M)

- An **order** can have **one or multiple payments**.
- `Payments.Order_ID_FK` links to `Orders.Order_ID`.

6. Orders & Order_Items (1:M)

- An **order** can contain **multiple menu items**.
- `Order_Items.Order_ID_FK` links to `Orders.Order_ID`.

7. Order_Items & Menu_Items (M:1)

- Each **ordered item** references an **existing menu item**.
- `Order_Items.Item_ID_FK` links to `Menu_Items.Item_ID`.

8. Menu_Items & Menu_Categories (M:1)

- A **menu item** belongs to **one category**, but a **category** has multiple menu items.
- `Menu_Items.Category_ID_FK` links to `Menu_Categories.Category_ID`.

9. Suppliers & Inventory (1:M)

- A **supplier** provides **multiple inventory items**.
- `Inventory.Supplier_ID_FK` links to `Suppliers.Supplier_ID`.