

Introduction to the problem

The restaurant management system addresses the challenges of efficiently managing customer sessions, table availability, order processing, and payments. The current manual system often leads to inefficiencies such as overbooking tables, errors in order tracking, and delays in payments. This project introduces an automated solution using a database with key tables and functions:

- **Session Management:** Automatically creates and updates customer sessions, tracks the status (active/inactive), and manages table allocation.
- **Table Management:** Handles table availability, ensures tables are marked as unavailable when occupied, and adds extra tables when needed.
- **Order and Payment Management:** Automates order creation with random items, calculates the total amount, and links payments to receipts for seamless transaction handling.
- **Employee Management:** Tracks employee roles, including managers, waiters, and cooks, and ensures their data is efficiently stored.

By automating these processes, the system improves operational efficiency, reduces human error, and enhances the overall dining experience for customers.

Business Rules

1. Each restaurant is uniquely identified and must have a name, location, and operating hours.
2. A restaurant can have multiple employees, tables, menus, and products.
3. Each employee works for one restaurant and is uniquely identified by EmployeeID.
4. Employees have specific roles (e.g., Manager, Waiter, Cook) and must have a name, role, phone number, and salary.
5. Managers have a specific ManagerLevel, waiters track the TipsEarned, and cooks are associated with a KitchenSection.
6. An employee can only belong to one role at a time (Manager, Waiter, or Cook).

7. Each restaurant table belongs to one restaurant and is uniquely identified by TableID.
8. Each table must have a unique number (TableNumber), capacity, and availability status.
9. Tables are linked to sessions when used by customers.
10. Each customer is uniquely identified by CustomerID and must provide their name, phone number, and email address.
11. Customers can make multiple sessions, but each session must be tied to one customer.
12. A session is uniquely identified by SessionID and must be associated with one customer and one table.
13. A session can have a single payment and optional feedback.
14. Each feedback entry is linked to a session and uniquely identified by FeedbackID.
15. Feedback must include a rating and optional comments from the customer.
16. Payments are uniquely identified by PaymentID and must include a PaymentType (Cash or Card) and PaymentStatus.
17. Each session can only have one payment.
18. Payments by card must include the cardholder's name, card number, and CCV.
19. Each payment must result in one receipt uniquely identified by ReceiptID.
20. A receipt includes the payment ID and receipt date.
21. Each restaurant has one or more menus, identified by MenuID.
22. A menu can contain multiple products, but each product belongs to only one menu.
23. Products are uniquely identified by ProductID and must include a name, price, and description.
24. Customers can place orders uniquely identified by OrderID.
25. Each order must include the customer ID, table ID, order date, and total amount.
26. Orders consist of one or more order items.
27. Each order item is linked to a product and must include the quantity and LastPrice (price at the time of the order).

Textual Representation

1. Restaurant(RestaurantID: integer, Name: string, Location: string, OperatingHours: string)
2. Employee(EmployeeID: integer, Name: string, Role: string, PhoneNumber: string, Salary: real, RestaurantID: integer)
3. Manager(EmployeeID: integer, ManagerLevel: string)

4. Waiter(EmployeeID: integer, TipsEarned: real)
5. Cook(EmployeeID: integer, KitchenSection: string)
6. RestaurantTable(TableID: integer, TableNumber: integer, Capacity: integer, Available: boolean, RestaurantID: integer)
7. Customer(CustomerID: integer, Name: string, PhoneNumber: string, Email: string)
8. Session(SessionID: integer, CustomerID: integer, TableID: integer, Date: date, FeedbackID: integer)
9. Feedback(FeedbackID: integer, SessionID: integer, Rating: integer, Comments: string)
10. Payment(PaymentID: integer, SessionID: integer, PaymentType: string, PaymentStatus: string)
11. Cash(PaymentID: integer, Currency: string)
12. Card(PaymentID: integer, OwnerName: string, CardNumber: string, CCV: string)
13. Receipt(ReceiptID: integer, PaymentID: integer, ReceiptDate: date)
14. Menu(MenuID: integer, Name: string, Description: string, Category: string, RestaurantID: integer)
15. Product(ProductID: integer, Name: string, Price: real, MenuID: integer)
16. RestaurantOrder(OrderID: integer, CustomerID: integer, TableID: integer, OrderDate: date, TotalAmount: real)
17. OrderItem(OrderItemID: integer, OrderID: integer, ProductID: integer, Quantity: integer, LastPrice: real)