

Design and implement database system for an online food delivery platform. The system will manage restaurants, customers, orders, delivery personnel, payments, and reviews.

Database Tables

Create the following tables with appropriate data types and constraints:

1. Customers

- CustomerID
- Name
- Email
- Phone
- Address
- JoinDate
- Points

2. Restaurants

- RestaurantID
- Name
- Address
- Phone
- CuisineType
- Rating
- DeliveryFee
- IsActive

3. MenuItems

- ItemID
- RestaurantID
- ItemName
- Description
- Price
- Category
- IsAvailable
- PreparationTime

4. Orders

- OrderID
- CustomerID
- RestaurantID
- DeliveryPersonID
- OrderDate
- TotalAmount
- DeliveryFee
- Status
- DeliveryAddress

5. OrderDetails

- OrderDetailID
- OrderID
- ItemID
- Quantity
- UnitPrice
- SpecialInstructions

6. DeliveryPersonnel

- DeliveryPersonID
- Name
- Phone
- VehicleType
- IsAvailable
- CurrentLocation

7. Payments

- PaymentID
- OrderID
- PaymentMethod
- Amount
- PaymentDate
- Status

8. Reviews

- ReviewID
- CustomerID

- RestaurantID
- OrderID
- Rating
- Comment
- ReviewDate

Requirements:

1. Functions and Procedures (7 marks)

Create the following:

- Function to calculate delivery time estimate based on distance and preparation time
- Stored Procedure to Complete order placement process (validate items, calculate total, assign delivery person)
- Function to Calculate points earned based on order value
- Stored Procedure to Update order status with appropriate business logic

2. Indexes (5 marks)

Implement the following indexes:

- Clustered indexes on all primary keys
- Non-clustered index on CustomerID in Orders table
- Non-clustered index on RestaurantID in MenuItems table
- Composite index on RestaurantID + Category for efficient menu browsing
- Index on DeliveryPersonID + IsAvailable for delivery assignment

3. Triggers (4 marks)

Create these triggers:

- AFTER INSERT trigger on Orders table to update customer points
- AFTER UPDATE trigger on Orders table to update delivery person availability when order status changes
- BEFORE UPDATE trigger on MenuItems table to log price changes
- AFTER INSERT trigger on Reviews table to automatically recalculate restaurant rating

4. Transactions (6 marks)

Implement the following transactions

- Complete order placement transaction (order creation + payment processing + delivery assignment)
- Order cancellation transaction with refund processing
- Delivery completion transaction with payment settlement

Rules to Implement

Your system must enforce these rules:

1. Orders can only be placed from active restaurants with available menu items
2. Each delivery person can handle only one order at a time
3. Automatic points calculation: 1 point for every \$10 spent
4. Restaurant ratings are automatically updated based on customer reviews
5. Order cancellation is allowed only within 5 minutes of placement