# DATABASE MANAGEMENT SYSTEM - CSA0593

# ASSIGNMENT 4

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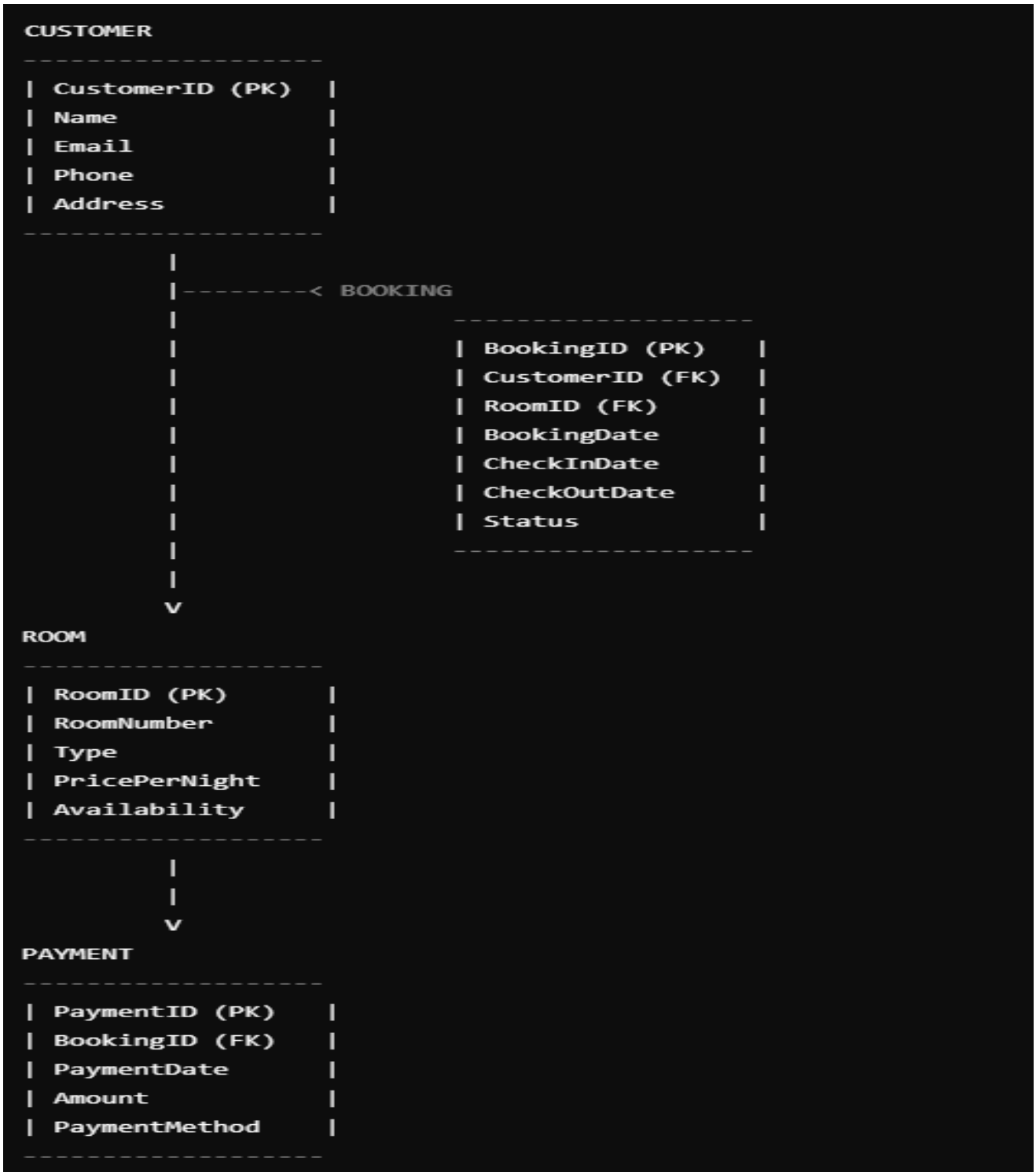
## QUESTION:

Design a database schema and write SQL code for managing customers, rooms, bookings, and payments

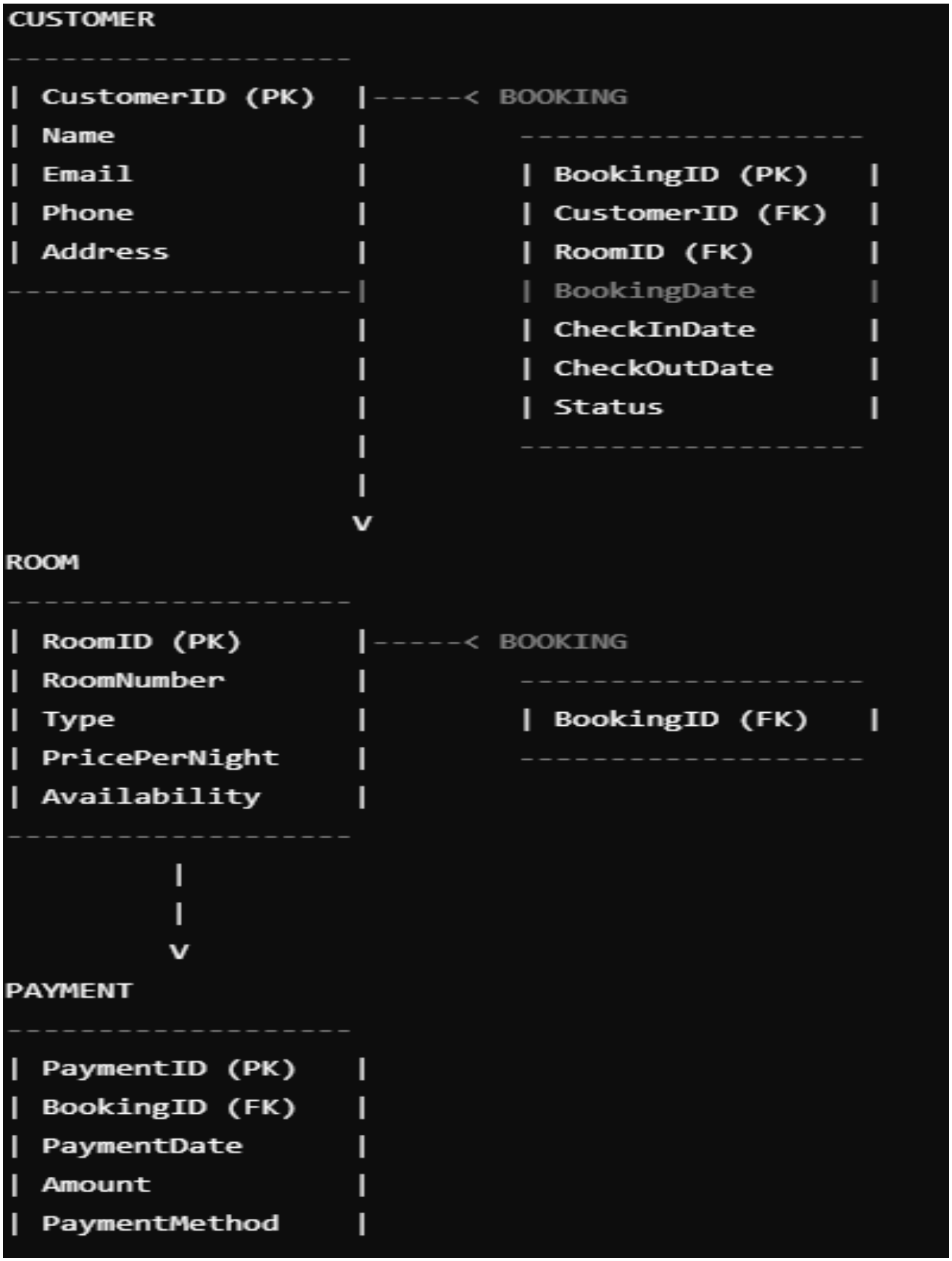
- Model tables for customers, rooms, bookings, and payments.
- Write stored procedures to book rooms and process customer payments.
- Implement triggers to manage room availability and update booking status.
- Write SQL queries to analyze room occupancy and total revenue from bookings.

ANSWER:

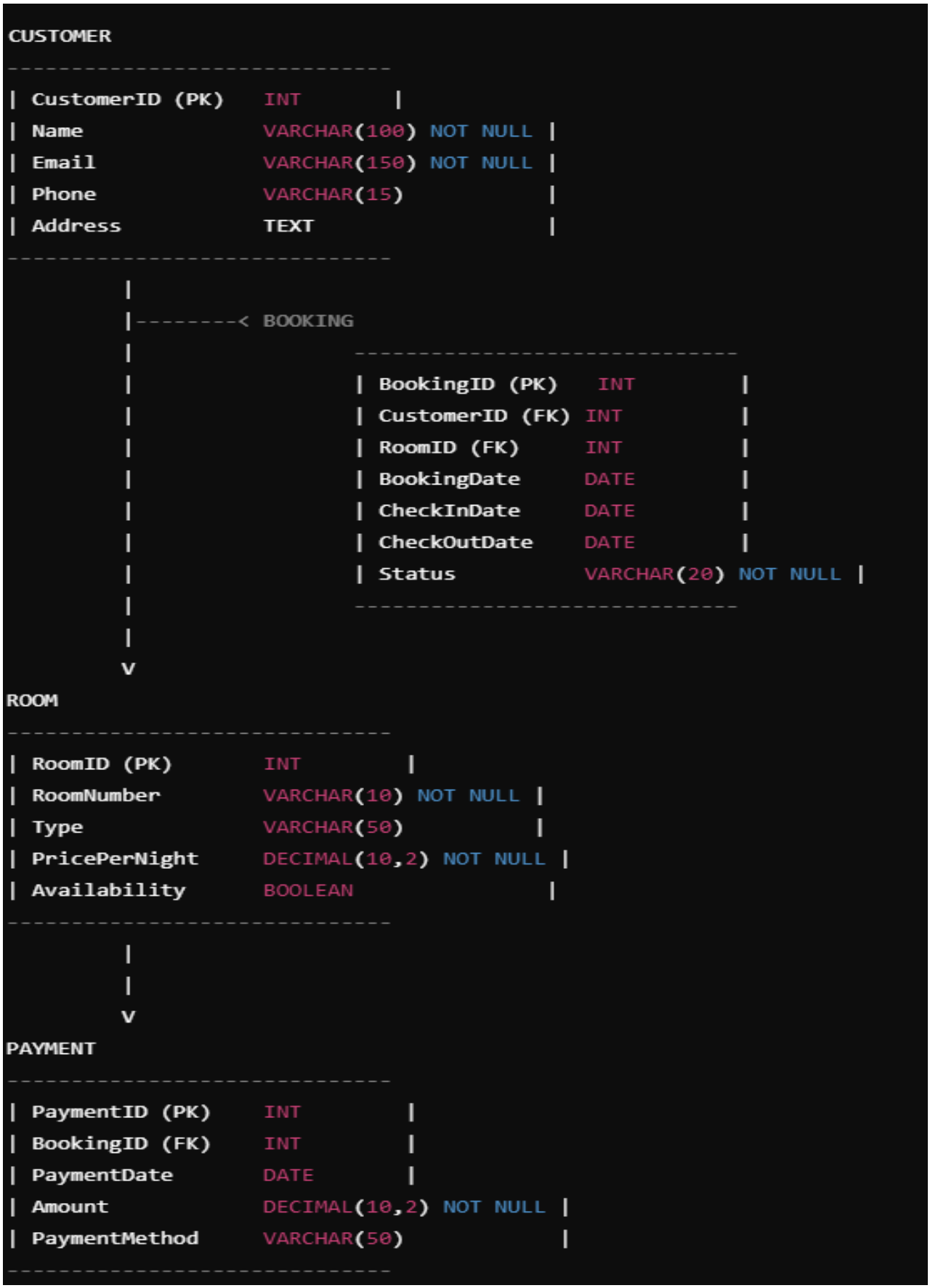
CONCEPTUAL E.R.DIAGRAM:



LOGICAL E.R.DIAGRAM:



PHYSICAL E.R.DIAGRAM:



# MYSQL STATEMENTS:

```
mysql
CREATE DATABASE HotelManagement;

USE HotelManagement;

CREATE TABLE Customers (
  CustomerID INT AUTO_INCREMENT PRIMARY KEY,
  FirstName VARCHAR(50),
  LastName VARCHAR(50),
  Email VARCHAR(100),
  Phone VARCHAR(20)
);

CREATE TABLE Rooms (
  RoomID INT AUTO_INCREMENT PRIMARY KEY,
  RoomNumber INT,
  RoomType VARCHAR(50),
  Rate DECIMAL(10, 2),
  Status VARCHAR(20)
);

CREATE TABLE Bookings (
  BookingID INT AUTO_INCREMENT PRIMARY KEY,
  CustomerID INT,
  RoomID INT,
  ArrivalDate DATE,
  DepartureDate DATE,
  BookingStatus VARCHAR(20),
```

```
  FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID),
  FOREIGN KEY (RoomID) REFERENCES Rooms(RoomID)
);

CREATE TABLE Payments (
  PaymentID INT AUTO_INCREMENT PRIMARY KEY,
  BookingID INT,
  PaymentDate DATE,
  PaymentAmount DECIMAL(10, 2),
  PaymentMethod VARCHAR(50),
  FOREIGN KEY (BookingID) REFERENCES Bookings(BookingID)
);
```

Stored Procedures:

```
mysql
DELIMITER //

CREATE PROCEDURE sp_BookRoom(
  IN customerID INT,
  IN roomID INT,
  IN arrivalDate DATE,
  IN departureDate DATE
)
BEGIN
  INSERT INTO Bookings (CustomerID, RoomID, ArrivalDate, DepartureDate, BookingStatus)
  VALUES (customerID, roomID, arrivalDate, departureDate, 'Booked');
```

```
  UPDATE Rooms
  SET Status = 'Occupied'
  WHERE RoomID = roomID;
END //

CREATE PROCEDURE sp_ProcessPayment(
  IN bookingID INT,
  IN paymentDate DATE,
  IN paymentAmount DECIMAL(10, 2),
  IN paymentMethod VARCHAR(50)
)
BEGIN
  INSERT INTO Payments (BookingID, PaymentDate, PaymentAmount, PaymentMethod)
  VALUES (bookingID, paymentDate, paymentAmount, paymentMethod);

  UPDATE Bookings
  SET BookingStatus = 'Paid'
  WHERE BookingID = bookingID;
END //

DELIMITER ;
```

Triggers:

```
mysql
DELIMITER //
```

```
CREATE TRIGGER tr_UpdateRoomAvailability
AFTER INSERT ON Bookings
FOR EACH ROW
BEGIN
  UPDATE Rooms
  SET Status = 'Occupied'
  WHERE RoomID = NEW.RoomID;
END //

CREATE TRIGGER tr_UpdateBookingStatus
AFTER UPDATE ON Payments
FOR EACH ROW
BEGIN
  UPDATE Bookings
  SET BookingStatus = 'Paid'
  WHERE BookingID = NEW.BookingID;
END //

DELIMITER;
```

SQL Queries for Analysis:

```
mysql
-- Room Occupancy
SELECT
  RoomNumber,
```

```
  RoomType,
  COUNT(*) AS TotalBookings,
  SUM(CASE WHEN BookingStatus = 'Paid' THEN 1 ELSE 0 END) AS PaidBookings
FROM
  Rooms
  JOIN Bookings ON Rooms.RoomID = Bookings.RoomID
GROUP BY
  RoomNumber, RoomType;

-- Total Revenue from Bookings
SELECT
  SUM(PaymentAmount) AS TotalRevenue
FROM
  Payments;

-- Customer Booking History
SELECT
  CustomerID,
  FirstName,
  LastName,
  COUNT(*) AS TotalBookings
FROM
  Customers
  JOIN Bookings ON Customers.CustomerID = Bookings.CustomerID
GROUP BY
  CustomerID, FirstName, LastName;
```

## Conclusion:

This database design provides a comprehensive foundation for managing customers, rooms, bookings, and payments. The stored procedures simplify room booking and payment processing, while the triggers ensure data consistency and accuracy. The SQL queries enable analysis of room occupancy, total revenue, and customer booking history.