**1. Library Management System (Education)**

**Tables:**

* Books (BookID, Title, Author, Genre, PublishedYear, Status)
* Members (MemberID, Name, Email, Phone, JoinDate)
* BorrowRecords (RecordID, MemberID, BookID, BorrowDate, ReturnDate)

**Solution:**

-- Find books that are currently available

SELECT \* FROM Books WHERE Status = 'Available';

-- Find books borrowed by a specific member

SELECT b.Title, br.BorrowDate, br.ReturnDate

FROM BorrowRecords br

JOIN Books b ON br.BookID = b.BookID

WHERE br.MemberID = 101;

-- Update book status when borrowed

UPDATE Books

SET Status = 'Borrowed'

WHERE BookID = 5;

**2. Employee Attendance System (HR)**

**Tables:**

* Employees (EmpID, Name, Department, Position, Salary)
* Attendance (EmpID, Date, Status)

**Solution:**

-- Get total present days for each employee in a month

SELECT EmpID, COUNT(\*) AS PresentDays

FROM Attendance

WHERE Status = 'Present' AND Date BETWEEN '2024-02-01' AND '2024-02-29'

GROUP BY EmpID;

**3. Online Shopping System (E-commerce)**

**Tables:**

* Products (ProductID, Name, Category, Price, Stock)
* Customers (CustomerID, Name, Email)
* Orders (OrderID, CustomerID, OrderDate, TotalAmount)

**Solution:**

-- Fetch all orders with customer details

SELECT o.OrderID, c.Name, o.OrderDate, o.TotalAmount

FROM Orders o

JOIN Customers c ON o.CustomerID = c.CustomerID;

-- Find top 5 most purchased products

SELECT p.Name, COUNT(\*) AS PurchaseCount

FROM Orders o

JOIN OrderDetails od ON o.OrderID = od.OrderID

JOIN Products p ON od.ProductID = p.ProductID

GROUP BY p.Name

ORDER BY PurchaseCount DESC

LIMIT 5;

**4. Hospital Management System (Healthcare)**

**Tables:**

* Patients (PatientID, Name, Age, Gender, Disease)
* Doctors (DoctorID, Name, Specialty)
* Appointments (AppointmentID, PatientID, DoctorID, Date, Status)

**Solution:**

-- Get list of upcoming appointments for a doctor

SELECT a.AppointmentID, p.Name, a.Date, a.Status

FROM Appointments a

JOIN Patients p ON a.PatientID = p.PatientID

WHERE a.DoctorID = 3 AND a.Date >= GETDATE();

**5. Banking System (Finance)**

**Tables:**

* Customers (CustomerID, Name, Email, Balance)
* Transactions (TransactionID, CustomerID, Amount, Type, Date)

**Solution:**

-- Find total deposits for each customer

SELECT CustomerID, SUM(Amount) AS TotalDeposits

FROM Transactions

WHERE Type = 'Deposit'

GROUP BY CustomerID;

**6. Movie Booking System (Entertainment)**

**Tables:**

* Movies (MovieID, Title, Genre, Duration)
* Theaters (TheaterID, Name, Location)
* Bookings (BookingID, MovieID, TheaterID, SeatNo, BookingDate)

**Solution:**

-- Get total seats booked for a movie in a theater

SELECT MovieID, TheaterID, COUNT(\*) AS TotalSeatsBooked

FROM Bookings

WHERE MovieID = 2 AND TheaterID = 1

GROUP BY MovieID, TheaterID;

**7. Hotel Reservation System (Hospitality)**

**Tables:**

* Rooms (RoomID, Type, Price, Status)
* Customers (CustomerID, Name, Email)
* Reservations (ResID, CustomerID, RoomID, CheckIn, CheckOut)

**Solution:**

-- Find available rooms

SELECT \* FROM Rooms WHERE Status = 'Available';

-- Get all reservations for a customer

SELECT r.ResID, c.Name, r.CheckIn, r.CheckOut

FROM Reservations r

JOIN Customers c ON r.CustomerID = c.CustomerID;

**8. School Management System (Education)**

**Tables:**

* Students (StudentID, Name, Age, Grade, Section)
* Subjects (SubjectID, Name, TeacherID)
* Marks (MarkID, StudentID, SubjectID, Score)

**Solution:**

-- Get top 3 students in a subject

SELECT s.Name, m.Score

FROM Marks m

JOIN Students s ON m.StudentID = s.StudentID

WHERE m.SubjectID = 1

ORDER BY m.Score DESC

LIMIT 3;

**9. Inventory Management System (Retail)**

**Tables:**

* Products (ProductID, Name, Quantity, Price, SupplierID)
* Suppliers (SupplierID, Name, Contact)
* Purchases (PurchaseID, ProductID, SupplierID, Quantity, Date)

**Solution:**

-- Get total stock for each product

SELECT ProductID, SUM(Quantity) AS TotalStock

FROM Purchases

GROUP BY ProductID;

**10. Flight Reservation System (Travel)**

**Tables:**

* Flights (FlightID, Airline, Origin, Destination, DepartureTime, ArrivalTime, SeatsAvailable)
* Passengers (PassengerID, Name, Email, Phone)
* Bookings (BookingID, FlightID, PassengerID, SeatNo, BookingDate)

**Solution:**

-- Find available flights from one city to another

SELECT \* FROM Flights

WHERE Origin = 'New York' AND Destination = 'Los Angeles'

AND SeatsAvailable > 0;