**📘 Day 62 – SQL Challenge (Case Study Style)**

**Dataset Theme:** Airline Booking & Flight Performance Analytics ✈️

**Tables & Sample Data**

**Passengers**

|  |  |  |  |
| --- | --- | --- | --- |
| PassengerID | Name | Country | JoinDate |
| 1 | Alice | USA | 2020-01-15 |
| 2 | Bob | UK | 2019-03-22 |
| 3 | Charlie | India | 2021-07-19 |
| 4 | David | Canada | 2022-11-11 |
| 5 | Eva | Germany | 2018-05-01 |

**Flights**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| FlightID | Airline | Source | Destination | FlightDate | Capacity |
| 101 | AirUSA | New York | London | 2022-01-10 | 200 |
| 102 | EuroFly | London | Berlin | 2022-01-15 | 180 |
| 103 | IndAir | Delhi | Toronto | 2022-02-05 | 220 |
| 104 | CanJet | Toronto | New York | 2022-02-10 | 150 |
| 105 | SkyHigh | Berlin | Delhi | 2022-03-12 | 210 |

**Bookings**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| BookingID | PassengerID | FlightID | BookingDate | SeatClass | Price | Status |
| 201 | 1 | 101 | 2022-01-05 | Economy | 500 | Confirmed |
| 202 | 2 | 102 | 2022-01-10 | Business | 1200 | Confirmed |
| 203 | 3 | 103 | 2022-01-25 | Economy | 700 | Cancelled |
| 204 | 4 | 104 | 2022-02-01 | Economy | 450 | Confirmed |
| 205 | 5 | 105 | 2022-03-01 | Business | 1500 | Confirmed |
| 206 | 1 | 101 | 2022-01-07 | Business | 1400 | Confirmed |

**CheckIns**

|  |  |  |  |
| --- | --- | --- | --- |
| CheckInID | BookingID | CheckInDate | BaggageCount |
| 301 | 201 | 2022-01-10 | 2 |
| 302 | 202 | 2022-01-15 | 1 |
| 303 | 204 | 2022-02-10 | 0 |
| 304 | 205 | 2022-03-12 | 3 |
| 305 | 206 | 2022-01-10 | 1 |

**FlightPerformance**

|  |  |  |  |
| --- | --- | --- | --- |
| FlightID | OnTimeRate | DelayMinutesAvg | CancellationRate |
| 101 | 0.92 | 15 | 0.01 |
| 102 | 0.85 | 40 | 0.03 |
| 103 | 0.78 | 60 | 0.05 |
| 104 | 0.95 | 10 | 0.01 |
| 105 | 0.88 | 30 | 0.02 |

**Case Study Questions**

1. Find the **top 3 passengers by total spend** across all bookings.
2. Calculate the **seat occupancy rate** per flight (confirmed bookings ÷ capacity).
3. Find the **average ticket price per seat class** (Economy vs Business).
4. Identify passengers who booked the **same flight more than once**.
5. Calculate the **total baggage count per passenger**.
6. Show the **on-time performance ranking of airlines** (by average OnTimeRate).
7. Find flights where the **cancellation rate > 3%**.
8. Using **window functions**, calculate the **running spend per passenger** ordered by booking date.
9. Identify **loyal passengers**: those who flew more than 2 times with the same airline.
10. Find the **most profitable flight** (highest total revenue from confirmed bookings).

**Bonus (Advanced – Interview Style):**  
11. Detect **at-risk passengers** likely to churn:

* More than 1 cancelled booking, OR
* Took a flight with average delay > 45 mins, OR
* Only booked Economy but never Business.