Travel Industry Data Analytics

1. Introduction to Travel Industry Data Analytics

- Data analytics in the travel industry helps businesses optimize operations, improve customer experiences, and boost revenue.
- Uses **historical data, real-time insights, and predictive analytics** to enhance decision-making.

2. Key Data Sources

- **Booking & Reservation Data** (Flights, Hotels, Tours)
- **Customer Data** (Demographics, Preferences, Feedback)
- **Website & Mobile App Analytics** (User Behavior, Search Trends)
- **Social Media & Review Platforms** (Sentiment Analysis, Ratings)
- **Market & Competitor Data** (Pricing, Offers, Demand Trends)

3. Types of Analytics in Travel Industry

✅ **Descriptive Analytics** – Summarizes historical trends (e.g., seasonal demand, customer preferences).
✅ **Predictive Analytics** – Forecasts future trends using ML (e.g., demand prediction, dynamic pricing).
✅ **Prescriptive Analytics** – Suggests optimal actions (e.g., personalized recommendations, pricing strategies).
✅ **Real-time Analytics** – Monitors ongoing travel trends (e.g., flight delays, surge pricing).

4. Applications of Data Analytics in Travel

📊 **Customer Personalization** – Recommending destinations, hotels, and packages based on past behavior.
💰 **Revenue Management & Dynamic Pricing** – Adjusting prices based on demand, competitor pricing, and seasonality.
✈ **Operational Efficiency** – Optimizing airline routes, hotel occupancy, and transportation schedules.
🛌 **Marketing & Customer Engagement** – Targeted promotions, loyalty programs, and churn prediction.
🔍 **Fraud Detection** – Identifying anomalies in bookings and payments.

5. Tools & Technologies Used

- **Data Processing**: Python, R, SQL
- **BI & Visualization**: Tableau, Power BI
- **Machine Learning**: Scikit-learn, TensorFlow
- **Big Data**: Hadoop, Spark
- **Geospatial Analysis**: GIS, Google Maps API

Solve all the question given below using SQL. You need to submit SQL file as solutions.

1. Fetch the first 5 records from the Travel Table
2. Retrieve all the distinct travel modes used by tourists.
3. Retrieve all the distinct type of Accommodation used by tourists.
4. Display all records where the mode of travel is 'Flight'.
5. Count the number of tourists travelled to each country using different mode of travel.
6. Find total Tarvel Cost per person for different Mode of Travel for each Country.
7. Find the top 5 most visited countries by tourists.
8. List the top 5 most visited cities in each Country.
9. Find Total number of records, Minimum Number_of_Companions, Maximum Number_of_Companions,Sum of Total_Travel_Cost.
10. Calculate the average trip duration for each mode of Travel.
11. Find the count of Tourist per Season and identify the peak season.
12. Calculate the average duration of travel for each season (Winter, Summer, Spring, Fall).
13. Find the most popular accommodation type based on the number of trips.
14. Identify the top 5 cities with the longest average stay duration.
15. Compare average, maximum and minimum Travel Cost per Accommodation type.
    (Are there outliers in the cost of different accommodation types.
    Example: If an Airbnb stay costs more than luxury hotels, it may indicate outliers or incorrect data.)
16. Find travel modes that are rarely used in specific locations.

(Assuming fewer than 5 instances indicate an outlier)

17. Find unusually large travel groups. (Method: Use Z-score to detect groups that are significantly larger than average.)
    Z-Score = (No_Of_Companions - Mean of No_Of_Companions)/ (standard_deviation of No_Of_Companions)
18. Find the country with the highest percentage of family Visit as Main_Purpose.
19. Determine if certain cities are more popular for solo travelers vs. group travelers.
20. Find the Tourist_ID for the longest trip in terms of duration for each country.