SQL Training

Course-end Project

Air Cargo Analysis

Objectives

- To analyze the busiest route to increase the number of aircraft required

- To identify the regular customers to provide offers and prepare an analysis of the ticket sales

- To ensure the company improves its operability and becomes more customer-centric and appealing to travelers

Prerequisites

- ER diagram
- Working of database
- Working of tables
- SQL views
- SQL functions
- SQL queries

Industry Relevance

- **ER diagram:** It visualizes the structure of a table as well as the relationships between logically related tables.

- **Database:** It is a collection of tables that stores a specific set of structured data.

- **Tables:** It is a database object that contains all the data within it.

Industry Relevance

- Views: Views in SQL are similar to virtual tables. There are also rows and columns in a view, as in a real database table.

- SQL functions: Several built-in functions are available in SQL to calculate data.

- SQL queries: A query is a request for data or information from a database table or combination of tables. As a result of the structured query language (SQL), this data may be displayed as pictorials, graphs, or complex results, such as trend analyses from data mining tools.

Problem Statement

Air Cargo is an aviation company that provides air transportation services for passengers and freight. Air Cargo uses its aircraft to provide different services with
the help of partnerships or alliances with other airlines. The company wants to
prepare reports on regular passengers, busiest routes, ticket sales details, and
other scenarios to improve the ease of travel and booking for customers.

Note: You must download the dataset from the course resource section in the LMS and create the tables to perform the above objective.

Dataset Description

Customer: Contains the information of the customers

Variable   -   Description

customer_id -   ID of the customers

first_name   -   First name of the customers

last_name   -   Last name of the customers

date_of_birth -   Date of birth of the customers

gender   -   Gender of the customers

Dataset Description

passengers_on_flights: Contains information about the travel details

Variable	-	Description
aircraft_id	-	ID of each aircraft in a bran
route_id	-	Route ID of from and to location
locationcustomer_id	-	ID of the customer
depart	-	Departure place from the airport
arrival	-	Arrival place at the airport
seat_num	-	Unique seat number for each passenger
class_id	-	ID of travel class
travel_date	-	Travel date of each passenger
flight_num	-	Specific flight number for each route

Dataset Description

ticket_details: Contains information about the ticket details

Variable	-	Description
p_date	-	Ticket purchase date
customer_id	-	ID of the customer
aircraft_id	-	ID of each aircraft in a brand
class_id	-	ID of travel class
no_of_tickets	-	Number of tickets purchased
a_code	-	Code of each airport
price_per_ticket	-	Price of a ticket
brand	-	Aviation service provider for each aircraft

Dataset Description

routes: Contains information about the route details

Variable	-	Description
Route_id	-	Route ID of from and to location
Flight_num	-	Specific fight number for each route
Origin_airport	-	Departure location
Destination_airport	-	Arrival location
Aircraft_id	-	ID of each aircraft in a brand
Distance_miles	-	Distance between departure and arrival location

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Tasks to Perform

Perform the following tasks on the dataset provided using SQL:

1. Create an ER diagram for the given airline's database

2. Write a query to create a route_details table using suitable data types for the fields, such as route_id, flight_num, origin_airport, destination_airport, aircraft_id, and distance_miles; implement the check constraint for the flight number and unique constraint for the route_id fields; also, make sure that the distance miles field is greater than 0

3. Write a query to display all the passengers (customers) who have traveled on routes 01 to 25; refer to the data from the passengers_on_flights table

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Tasks to Perform

Perform the following tasks on the dataset provided using SQL:

4. Write a query to identify the number of passengers and total revenue in business class from the ticket_details table.

5. Write a query to display the full name of the customer by extracting the first name and last name from the customer table.

6. Write a query to extract the customers who have registered and booked a ticket. Use data from the customer and ticket_details tables.

7. Write a query to identify the customer's first name and last name based on their customer ID and brand (Emirates) from the ticket_details table.

Tasks to Perform

Perform the following tasks on the dataset provided using SQL:

8. Write a query to identify the customers who have traveled by *Economy Plus* class using Group By and Having clause on the passengers_on_flights table.

9. Write a query to identify whether the revenue has crossed 10000 using the IF clause on the ticket_details table.

10. Write a query to create and grant access to a new user to perform operations on a database.

11. Write a query to find the maximum ticket price for each class using window functions on the ticket_details table.

Tasks to Perform

Perform the following tasks on the dataset provided using SQL:

12. Write a query to extract the passengers whose route ID is 4 by improving the speed and performance of the passengers_on_flights table.

13. For route ID 4, write a query to view the execution plan of the passengers_on_flights table.

14. Write a query to calculate the total price of all tickets booked by a customer across different aircraft IDs using the rollup function.

15. Write a query to create a view with only business class customers along with the brand of airlines.

Tasks to Perform

Perform the following tasks on the dataset provided using SQL:

16. Write a query to create a stored procedure to get the details of all passengers flying between a range of routes defined in run time. Also, return an error message if the table doesn't exist.

17. Write a query to create a stored procedure that extracts all the details from the routes table where the traveled distance is more than 2000 miles.

18. Write a query to create a stored procedure that groups the distance traveled by each flight into three categories. The categories are, short distance travel (SDT) for >=0 AND <= 2000 miles, intermediate distance travel (IDT) for >2000 AND <=6500, and long-distance travel (LDT) for >6500.

Tasks to Perform

Perform the following tasks on the dataset provided using SQL:

19. Write a query to extract ticket purchase date, customer ID, and class ID and specify if the complimentary services are provided for the specific class using a stored function in the stored procedure on the ticket_details table.

Condition:
- If the class is *Business* and *Economy Plus,* then complimentary services are given as *Yes,* else it is *No*

20. Write a query to extract the first record of the customer whose last name ends with Scott using a cursor from the customer table.

Project Outcome

- This project is designed to analyze the busiest route to increase the number of aircraft required.

- It also helps to identify the regular customers to provide offers and prepare an analysis of the ticket sales.

- You should be able to ensure the company improves its operability and becomes more customer-centric and appealing to travelers.

Submission Process

1. Complete the project in the Simplilearn lab

2. Complete each task listed in the problem statement

3. Take screenshots of the results for each question and the corresponding code

4. Save it as a document and submit using the assessment tab

5. Tap the "Submit" button (this will present you with three choices)

6. Attach three files and then click "Submit"

Note: Be sure to include screenshots of the output

Thank You

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