Project Title:

Airline Data Management and Analysis Using Power BI

Problem Statement:

The airline industry operates with numerous complexities, requiring effective data management and insights into flight schedules, passenger details, and ticketing systems. This project aims to analyze airline operations for improving efficiency and customer satisfaction.

Datasets Used:

Ticket_Information Passenger_Information Flight_Information

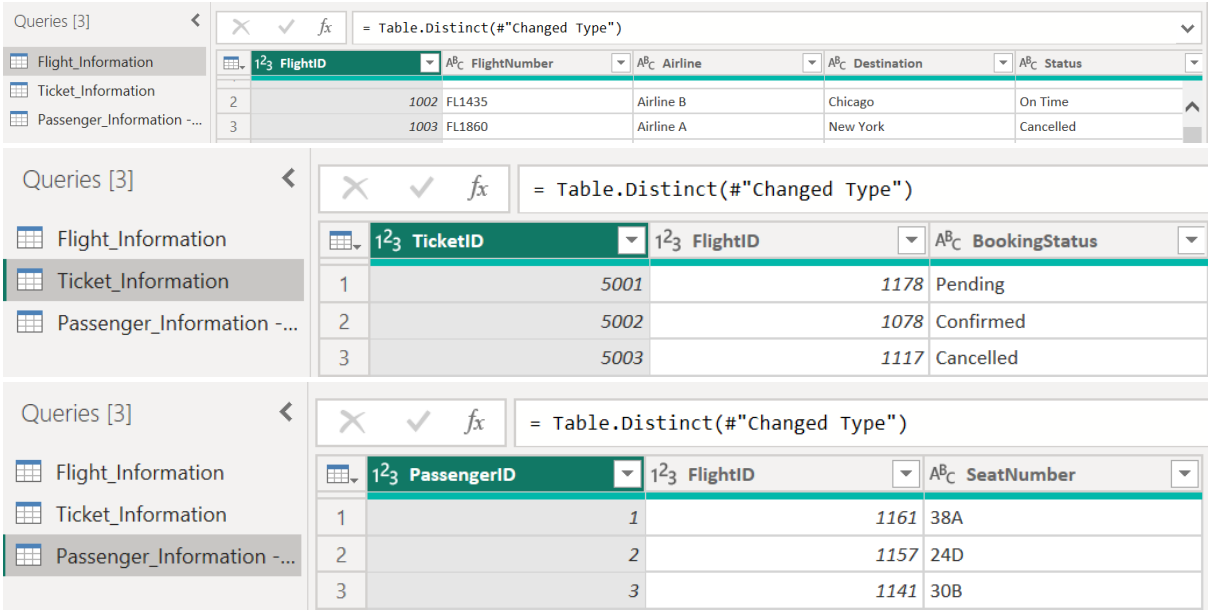
1. **Flight Information:** Includes FlightID, FlightNumber, Airline, Destination, and Status.
2. **Passenger Information:** Includes PassengerID, FlightID, and SeatNumber.
3. **Ticket Information:** Includes TicketID, FlightID, and BookingStatus.

Tasks and Marks Distribution

1. Data Preparation and Cleaning
    - Extract and transform data in Power Query.
    - Clean data: remove duplicates, handle missing values, and format columns.
    - Deliverables: Screenshot of Power Query Editor showing cleaned data.

Key:

a) All columns in the datasets have appropriate data types now. I have attached the screenshot of three tables: Flight_Information, Ticket_Information and Passenger_Information.



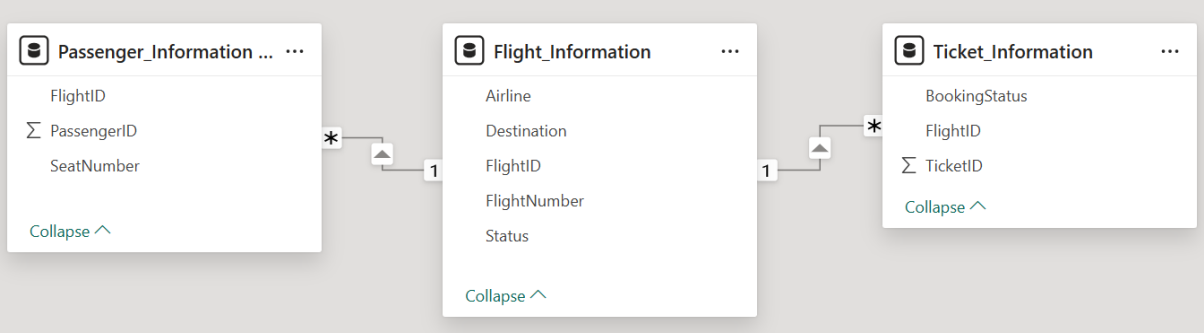
Task 2. Data Modeling

- Create relationships between datasets (FlightID as the key).
- Understand cardinality and configure the model appropriately.
- Deliverables: Screenshot of the data model with relationships.

Key:

a) Created Relationships
1. Established a one-to-many relationship between Flight_Information (1) and Passenger_Information (*) using the FlightID column.
2. Established a one-to-many relationship between Flight_Information (1) and Ticket_Information (*) using the FlightID column.

b) Configured the Model:
1. Established a one-to-many relationship between Flight_Information (1) and Ticket_Information (*) using the FlightID column.



Task 3. Enhanced Data Insights

- Add a conditional column to classify flights as "Best" or "To Be Improved" based on status.
- Use "Column from Examples" to extract the flight number from FlightNumber.
- Deliverables: Screenshot of the transformed data.

Key:

a) Add a Conditional column for Performance_Status.
1. Click on Add Column → Conditional Column.
2. Enter the new column name: Proformance_Status.

b) Define the Conditions
1. Column Name: Status
2. Operators: is equal
3. Value: On Time
4. Output: Best

c) Second Condition (To Be Improved)
1. Click on add clause.
2. Column Name: Status
3. Operators: is equal
4. Value: Delayed
5. Output: To Be Improved

d) Else Condition

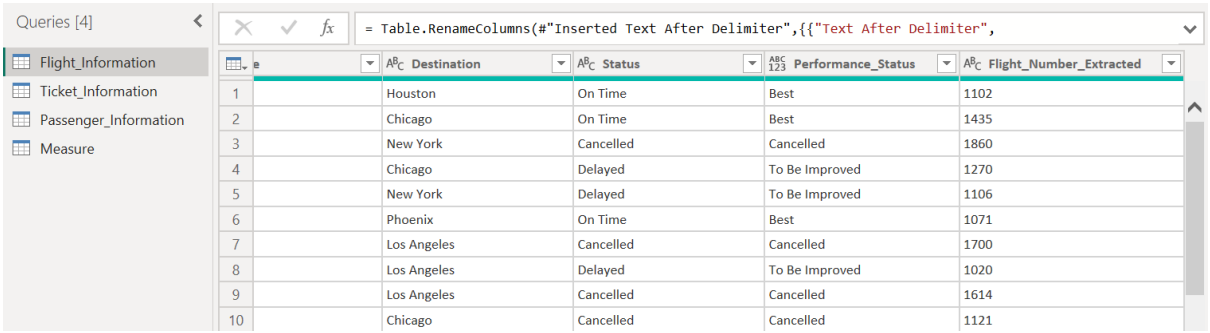
1. In the Else Box, enter: Cancelled

e) Create column for example

1. Go to Add Column → Column from Example → From Selection

f) Type the Example Value

1. In the new column, type the all letter of the FlightNumber.
2. Power BI will detect the pattern and automatically fill in the rest of the rows.



	e	Destination	Status	Performance_Status	Flight_Number_Extracted
1		Houston	On Time	Best	1102
2		Chicago	On Time	Best	1435
3		New York	Cancelled	Cancelled	1860
4		Chicago	Delayed	To Be Improved	1270
5		New York	Delayed	To Be Improved	1106
6		Phoenix	On Time	Best	1071
7		Los Angeles	Cancelled	Cancelled	1700
8		Los Angeles	Delayed	To Be Improved	1020
9		Los Angeles	Cancelled	Cancelled	1614
10		Chicago	Cancelled	Cancelled	1121

Task 4. Calculations Using DAX

- Calculate
  - Total passengers for a specific flight.
  - Total tickets booked.
  - Filtered table showing "Best" flights only.

Key:

a) Create Measures:

1. **Total Passengers = COUNTROWS(Passenger_Information)**
2. **Total Tickets Booked = COUNTROWS(Ticket_Information)**

b) This is not a measure, but a Calculated Table.

1. **Best Flights = FILTER(Flight_Information,Flight_Information[Performance_Status]="Best")**

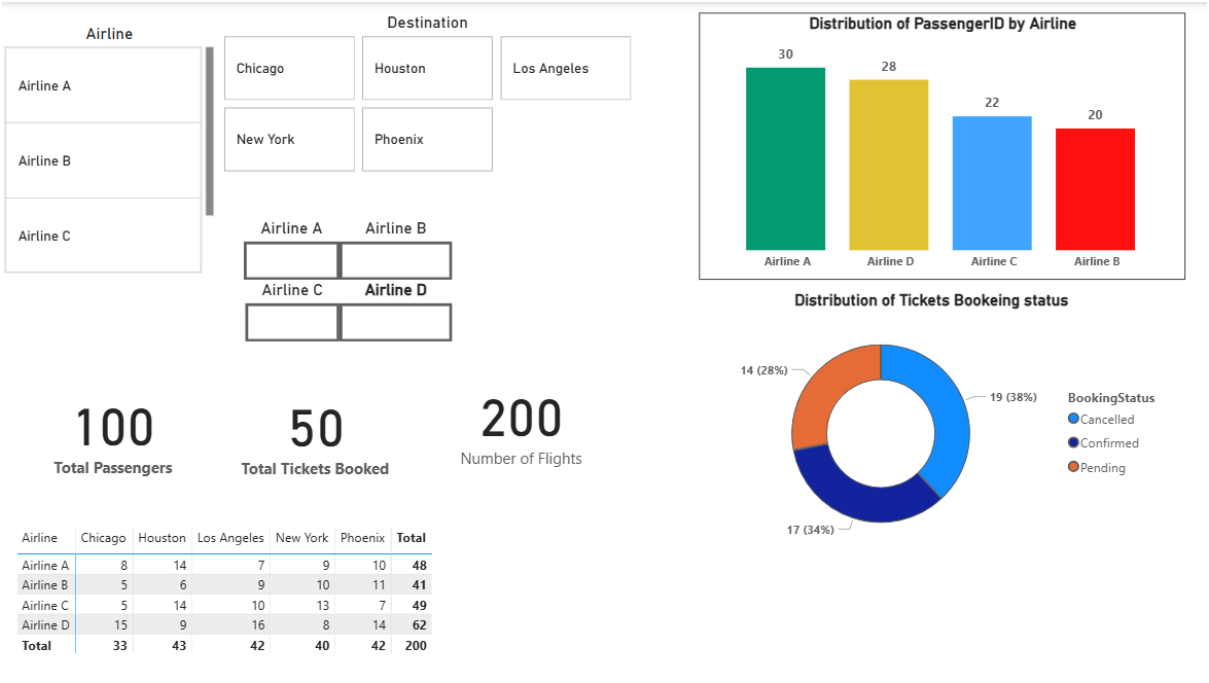
FlightNumber	Performance_Status
FL1004	Best
FL1014	Best
FL1020	Best
FL1027	Best
FL1032	Best
FL1040	Best
FL1047	Best
FL1071	Best
FL1091	Best
FL1095	Best
FL1102	Best
FL1128	Best
FL1130	Best
FL1134	Best
FL1166	Best

Task 5. Visualization and Interactive Features

- **Create visuals for:**
  - Passenger count by airline.
  - Ticket booking statuses.
  - Flights by airline and destination.
- **Add interactive features for:**
  - Destination and Airline.
  - Quick views.
  - Airline-specific pages.

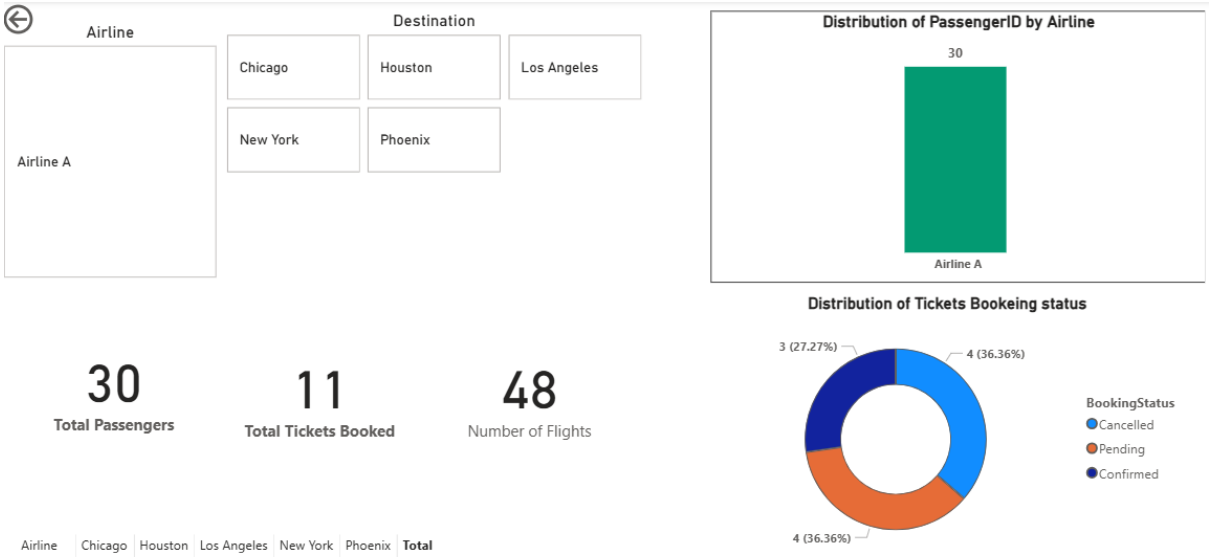
Key:

1. **Main Dashboard**



Airline	Chicago	Houston	Los Angeles	New York	Phoenix	Total
Airline A	8	14	7	9	10	**48**
Airline B	5	6	9	10	11	**41**
Airline C	5	14	10	13	7	**49**
Airline D	15	9	16	8	14	**62**
Total	**33**	**43**	**42**	**40**	**42**	**200**

2. **Airline A Specific page**



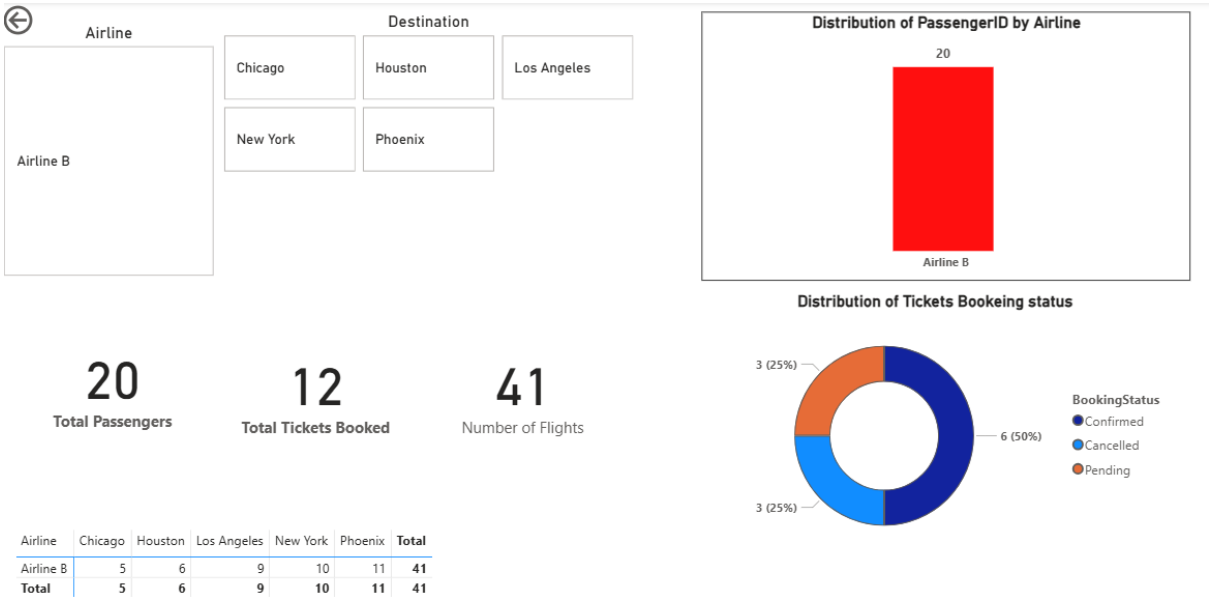
30
Total Passengers

11
Total Tickets Booked

48
Number of Flights

Airline	Chicago	Houston	Los Angeles	New York	Phoenix	Total
Airline A	8	14	7	9	10	48
Total	**8**	**14**	**7**	**9**	**10**	**48**

3. Airline B Specific page



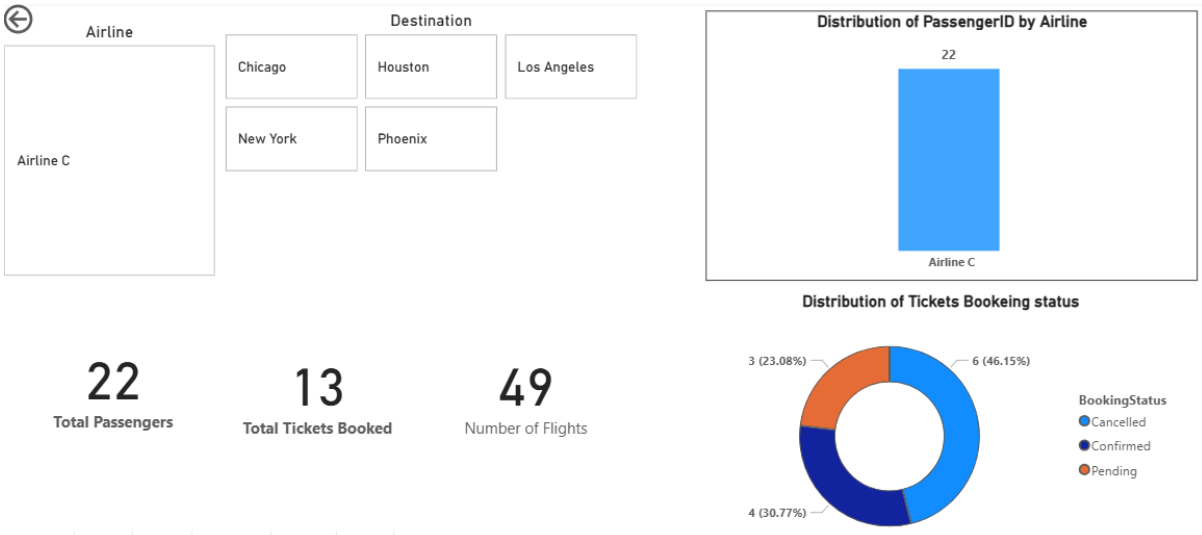
20
Total Passengers

12
Total Tickets Booked

41
Number of Flights

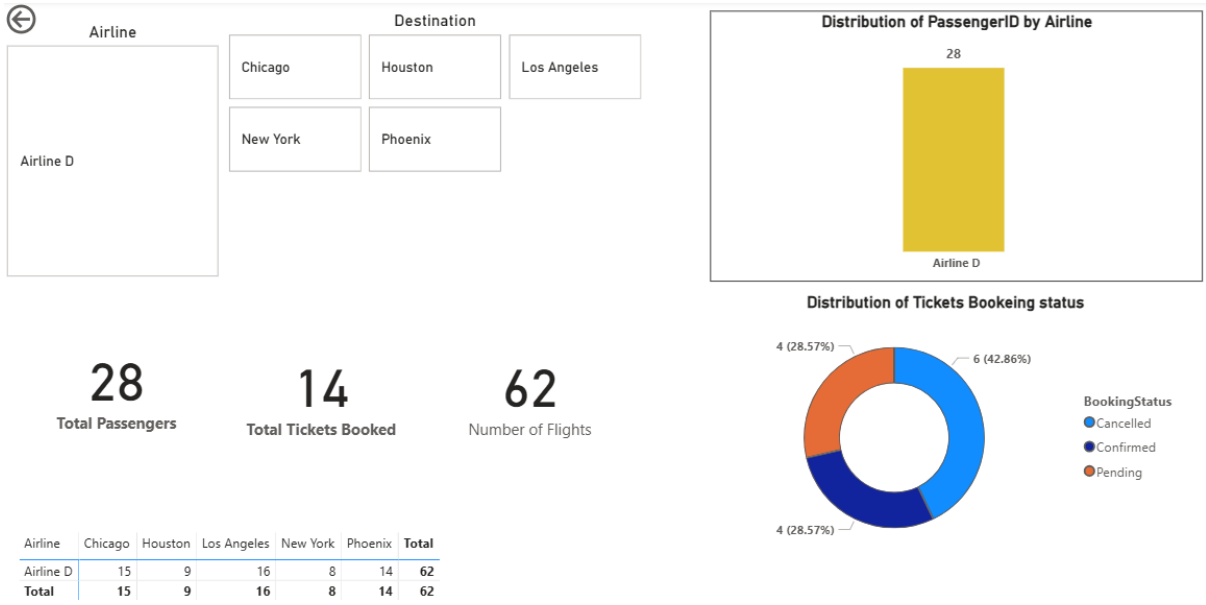
Airline	Chicago	Houston	Los Angeles	New York	Phoenix	Total
Airline B	5	6	9	10	11	41
Total	**5**	**6**	**9**	**10**	**11**	**41**

4. Airline C Specific page



Airline	Chicago	Houston	Los Angeles	New York	Phoenix	Total
Airline C	5	14	10	13	7	49
Total	**5**	**14**	**10**	**13**	**7**	**49**

5. Airline D Specific page



Airline	Chicago	Houston	Los Angeles	New York	Phoenix	Total
Airline D	15	9	16	8	14	62
Total	**15**	**9**	**16**	**8**	**14**	62

Task 6. Final Dashboard and Power BI Service

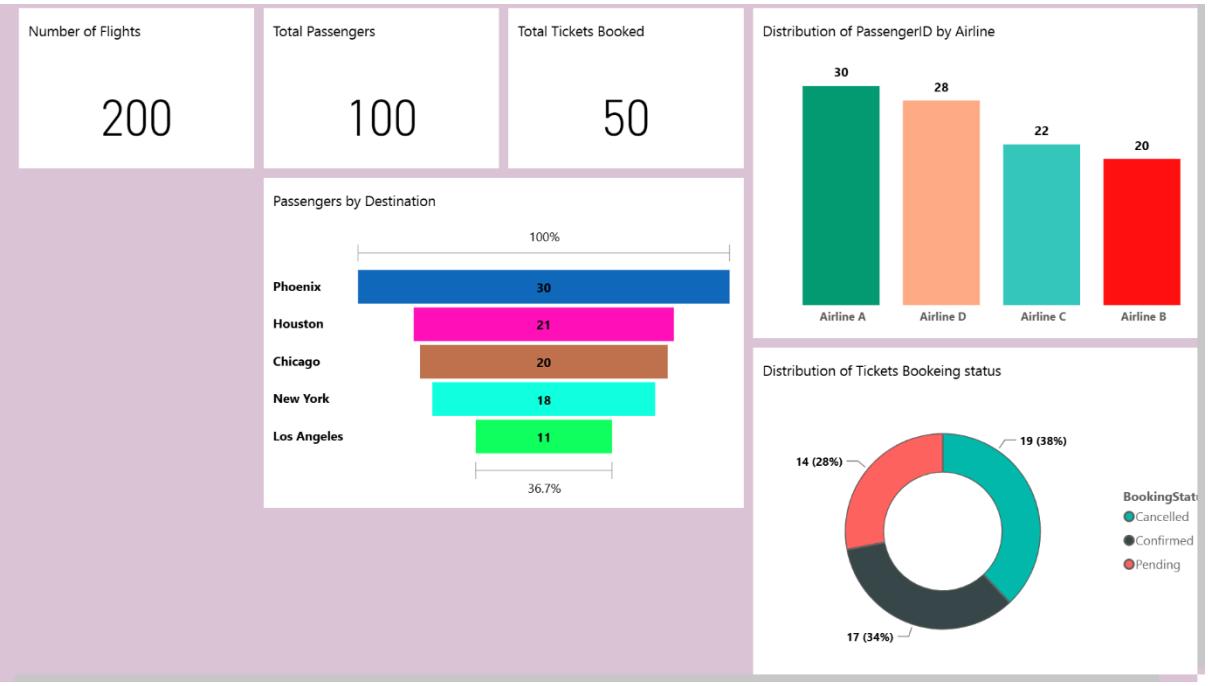
- Design a comprehensive dashboard with key visuals and insights.
- Configure Row-Level Security (RLS) for Airline A data and assign it to a user.
- Set up a schedule refresh at 5 PM daily.

Key:

a) Dashboard on Power Bi Service

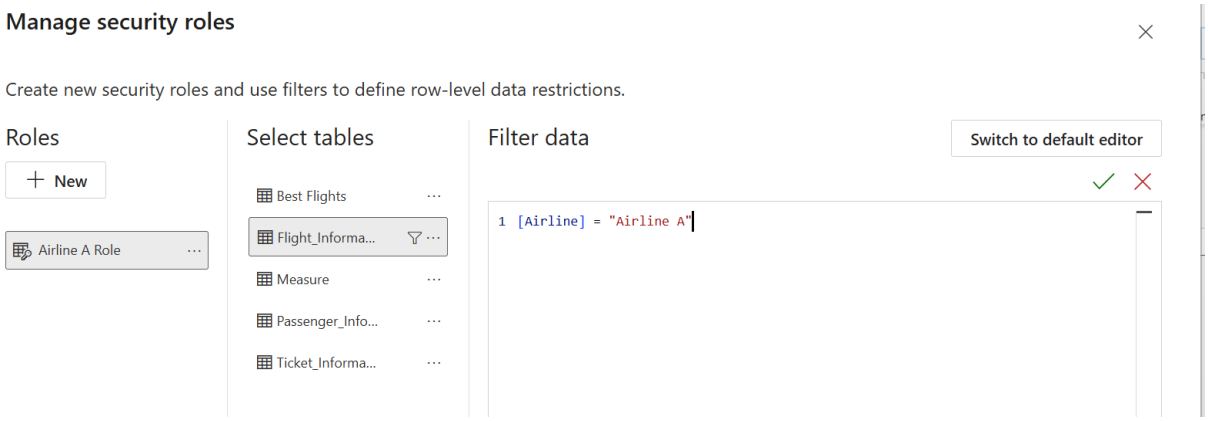
1. Publish the file from Power BI Desktop.
2. Open power BI service → clicked on my workspace.
3. Open the saved file which name was airline.

4. In the menu bar click on three dots → select to pin to a dashboard.
5. Create a new dashboard, the new dashboard name given “Flight Performance Dashboard”.
6. From edit option we change the Dashboard theme.



b) Steps to set up RLS in Power BI:

1. Open Power BI Desktop → go to Model View.
2. Click Manage Roles → Create Role → name it Airline_A.
3. Apply filter on Flight_Information table:
   [Airline] = "Airline A"
4. Click View As Roles → select Airline_A to verify access.
5. Publish the report to Power BI Service.
6. In Workspace → Security, assign users’ emails to the Airline_A role.



c) Steps to Configure Refresh:

1. Go to Datasets → Select the dataset.
2. Go to the setting → Power BI setting.

3. Select Semantic Model → Refresh.
4. Select the time zone → Refresh frequency selects daily.
5. Set the time zone 5:00 PM → Apply.