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Airline Data Management and Analysis Using Power BI

1. Data Preparation and Cleaning (10 Marks)

- **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.**

Steps:-

Load the three Excel files into Power BI via Power Query Editor.

Clean data:

- Remove duplicates using Remove Duplicates.
- Handle missing values using Remove Rows → Remove Blank Rows or fill/replace as needed.
- Format columns (e.g., convert date columns to Date format, IDs to text, etc.).

Screenshots:-

i) Flight Information:-

Queries [3] ✕ ✓ f_x = Table.Distinct(#"Removed Duplicates", {"FlightNumber"}) ▼

	i2 ₃ FlightID	A ₀ FlightNumber	A ₀ Airline	A ₀ Destination	A ₀ Status
1		1001 FL1102	Airline D	Houston	On Time
2		1002 FL1435	Airline B	Chicago	On Time
3		1003 FL1860	Airline A	New York	Cancelled
4		1004 FL1270	Airline C	Chicago	Delayed
5		1005 FL1106	Airline C	New York	Delayed
6		1006 FL1071	Airline A	Phoenix	On Time
7		1007 FL1700	Airline C	Los Angeles	Cancelled
8		1008 FL1020	Airline C	Los Angeles	Delayed
9		1009 FL1614	Airline A	Los Angeles	Cancelled
10		1010 FL1121	Airline D	Chicago	Cancelled
11		1011 FL1466	Airline A	Phoenix	On Time
12		1012 FL1214	Airline D	New York	Delayed

Query Settings ✕

PROPERTIES

Name
flight_information

All Properties

APPLIED STEPS

- Source
- Navigation
- Promoted Headers
- Changed Type
- Removed Other Columns
- Removed Duplicates
- ✕ Removed Duplicates1

ii) Ticket Information:-

Queries [3] ✕ ✓ f_x = Table.Distinct(#"Removed Duplicates", {"FlightID"}) ▼

	i2 ₃ TicketID	i2 ₃ FlightID	A ₀ BookingStatus
1		5001	1178 Pending
2		5002	1078 Confirmed
3		5003	1117 Cancelled
4		5004	1120 Cancelled
5		5005	1137 Cancelled
6		5006	1162 Pending
7		5007	1076 Pending
8		5008	1035 Cancelled
9		5009	1001 Cancelled
10		5010	1040 Cancelled
11		5011	1064 Pending
12		5012	1150 Cancelled

Query Settings ✕

PROPERTIES

Name
ticket_information

All Properties

APPLIED STEPS

- Source
- Navigation
- Promoted Headers
- Changed Type
- Removed Other Columns
- Removed Duplicates
- ✕ Removed Duplicates1

iii) Passenger Information:-

Queries [3] ✕ ✓ f_x = Table.Distinct(#"Removed Duplicates1", {"SeatNumber"}) ▼

	i2 ₃ PassengerID	i2 ₃ FlightID	A ₀ SeatNumber
1		1	1161 38A
2		2	1157 24D
3		3	1141 30B
4		4	1046 17E
5		5	1035 29D
6		6	1134 10A
7		8	1115 20E
8		9	1197 34E
9		10	1047 2E
10		11	1153 43C
11		12	1194 48C
12		13	1010 47A
13		14	1056 23C

Query Settings ✕

PROPERTIES

Name
passenger_information

All Properties

APPLIED STEPS

- Source
- Navigation
- Promoted Headers
- Changed Type
- Removed Other Columns
- Removed Duplicates
- Removed Duplicates1
- ✕ Removed Duplicates2

2. Data Modeling (10 Marks)

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

Steps:-

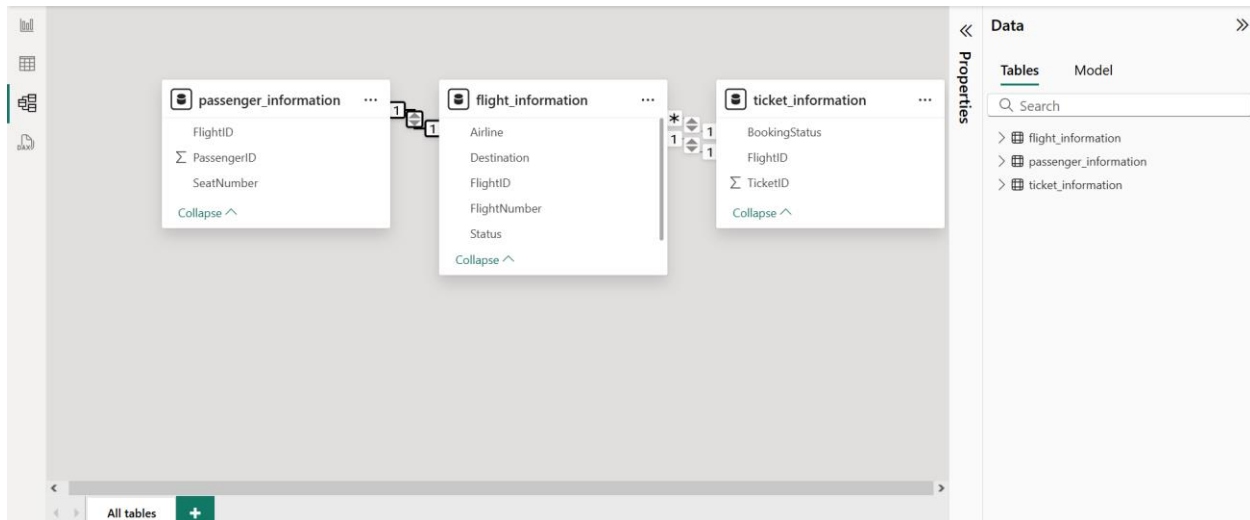
Go to Model View.

Create relationships:

- Flight_Information[FlightID] → Ticket_Information[FlightID]
- Flight_Information[FlightID] → Passenger_Information[FlightID]

Ensure cardinality is "One-to-Many" from Flight_Information to both other tables.

Screenshot:-



3. Enhanced Data Insights (10 Marks)

- 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.

Steps:-

- In Power Query:

- Add a conditional column in Flight_Information:
= if [Status] = "On Time" then "Best" else "To Be Improved"
- Use Column From Examples to extract flight number from FlightNumber (e.g., extract numeric part).

Screenshots:-

Add Conditional Column

Add a conditional column that is computed from the other columns or values.

New column name

Column Name	Operator	Value	Output
If Status	equals	ABC 123 On Time	Then ABC 123 Best

Else

Queries [3]

	FlightNumber	Airline	Destination	Status	Custom
1	102	Airline D	Houston	On Time	Best
2	435	Airline B	Chicago	On Time	Best
3	860	Airline A	New York	Cancelled	To Be Improved
4	270	Airline C	Chicago	Delayed	To Be Improved
5	106	Airline C	New York	Delayed	To Be Improved
6	071	Airline A	Phoenix	On Time	Best
7	700	Airline C	Los Angeles	Cancelled	To Be Improved
8	020	Airline C	Los Angeles	Delayed	To Be Improved
9	614	Airline A	Los Angeles	Cancelled	To Be Improved
10	121	Airline D	Chicago	Cancelled	To Be Improved
11	466	Airline A	Phoenix	On Time	Best
12	214	Airline D	New York	Delayed	To Be Improved
13	330	Airline C	Houston	On Time	Best

Query Settings

PROPERTIES

Name

APPLIED STEPS

- Source
- Navigation
- Promoted Headers
- Changed Type
- Removed Other Columns
- Removed Duplicates
- Removed Duplicates1
- Added Conditional Column

4. Calculations Using DAX (10 Marks)

- Calculate:
 - Total passengers for a specific flight.
 - Total tickets booked.

- Filtered table showing "Best" flights only.

- Deliverables: Screenshot of DAX calculations and results.

Dax Query:-

Flight Information:-

“BestFlights =

FILTER(Flight_Information, Flight_Information[FlightClass] = "Best")”

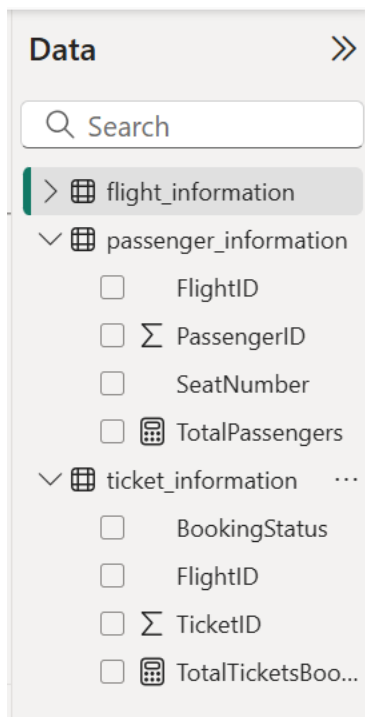
Passenger Information:-

“TotalPassengers = COUNTROWS(Passenger_Information)”

Ticket Information:-

“TotalTicketsBooked = COUNTROWS(Ticket_Information)”

Screenshots:-



5. Visualization and Interactive Features (20 Marks)

- **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.
- **Deliverables: Screenshots of all visuals and interactive features.**

Steps:-

Create visuals:

- Passenger count by airline → Bar chart.
- Ticket booking status → Pie chart.
- Flights by airline & destination → Matrix or stacked bar chart.

Add slicers for:

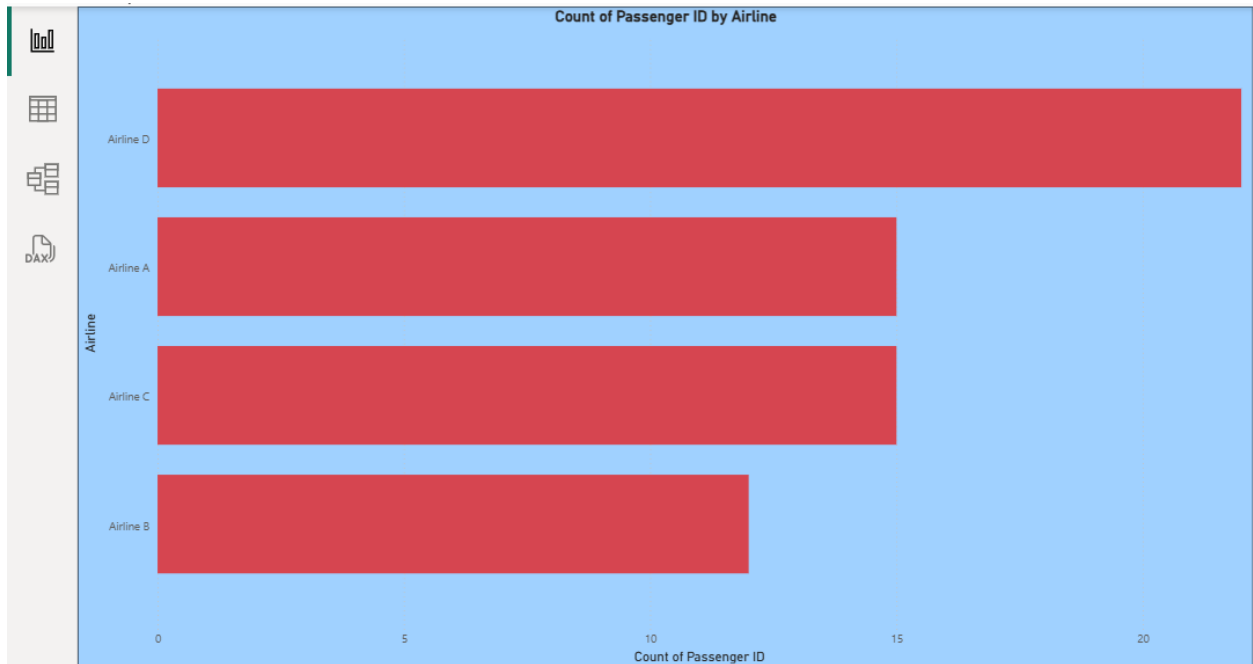
- Destination
- Airline

Use Page Navigation for airline-specific pages.

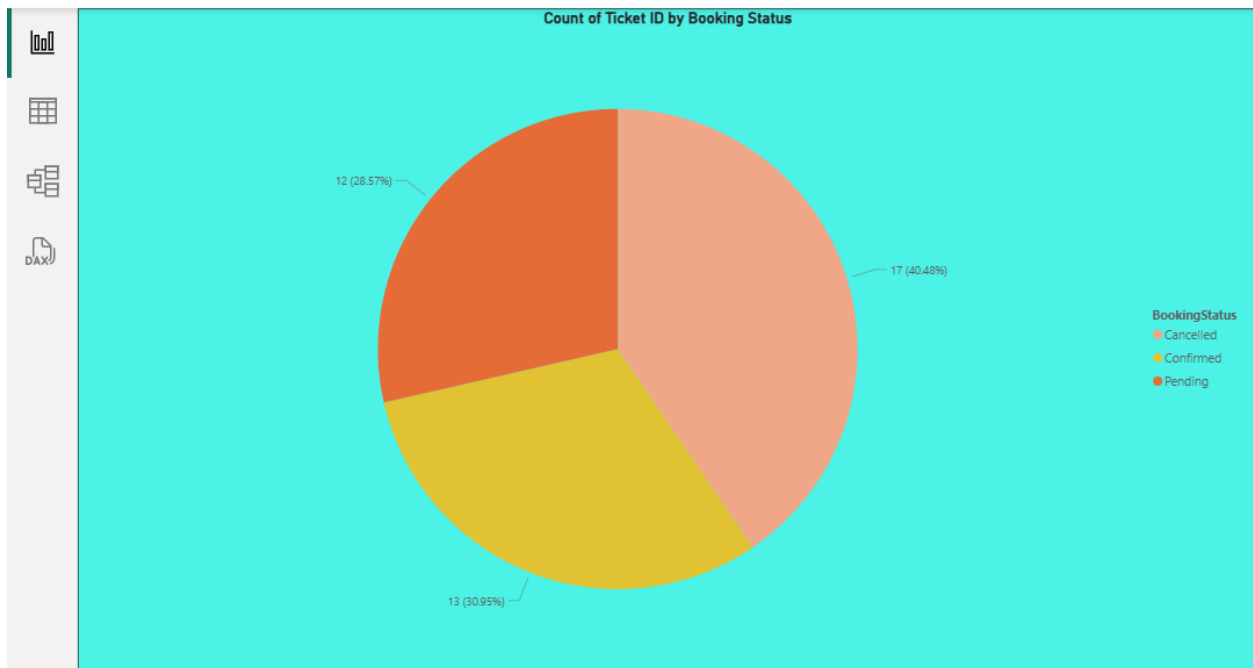
Add Quick Views using bookmarks and buttons.

Screenshots:-

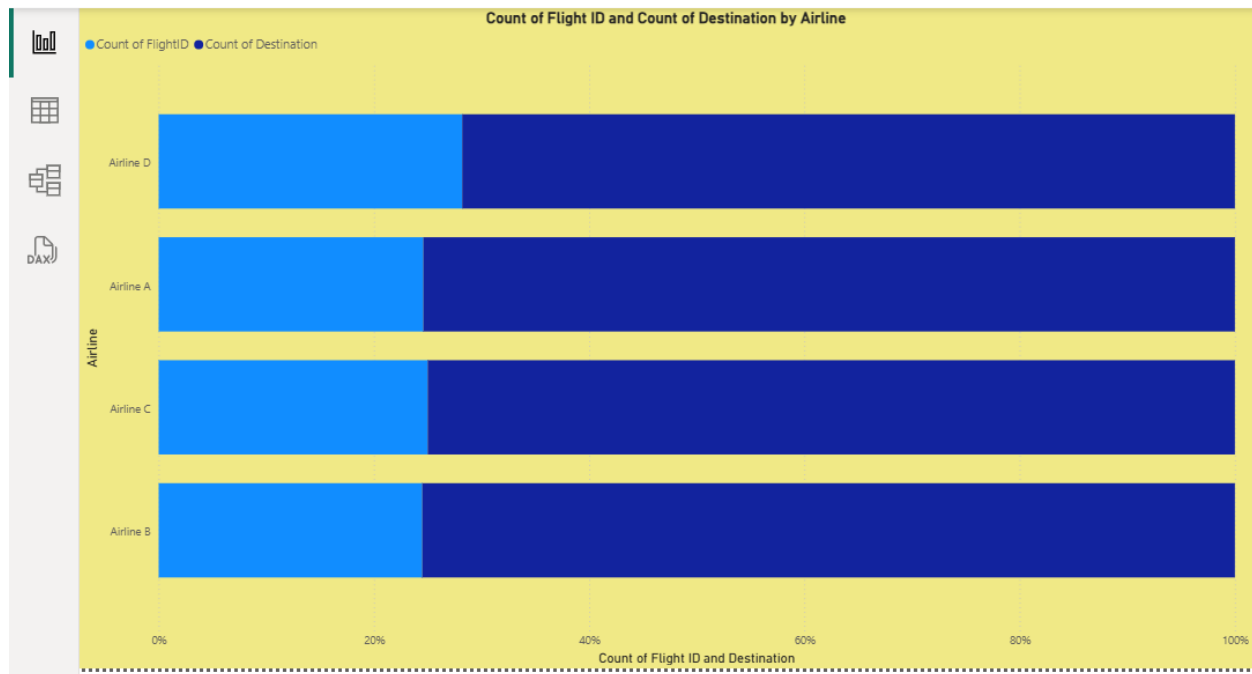
Passenger Count By Airline:-



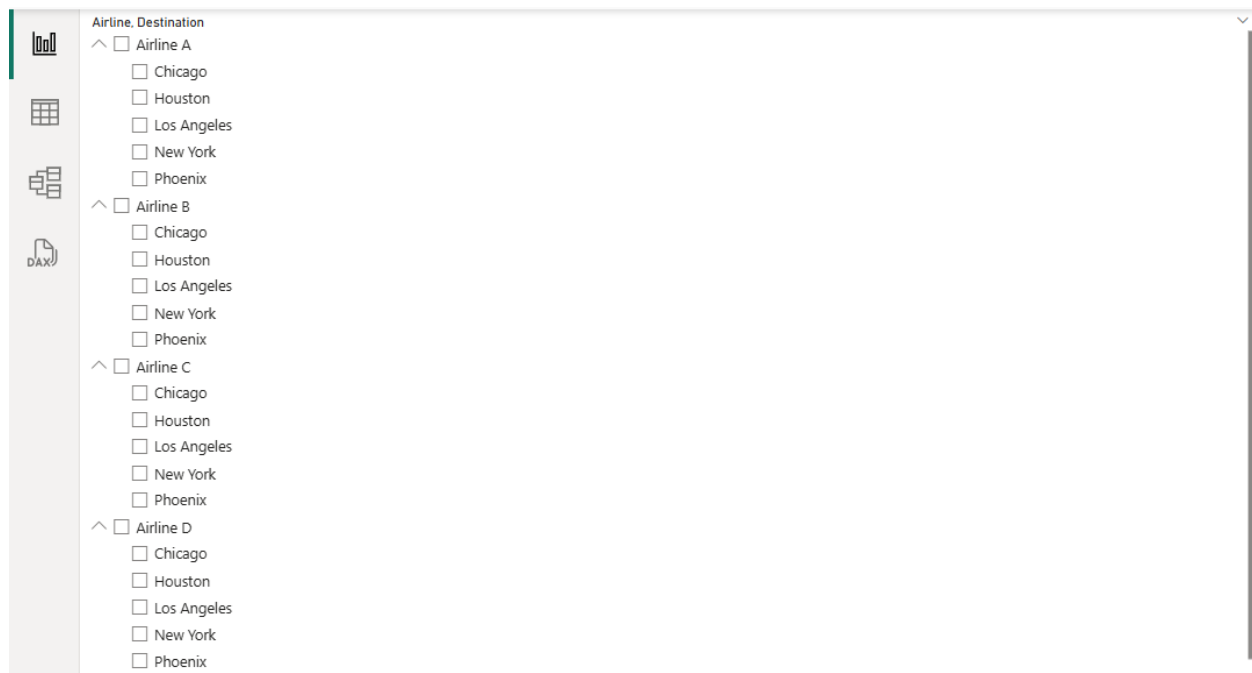
Ticket Booking Status:-



Flights By Airline and Destination:-



Slicer:-



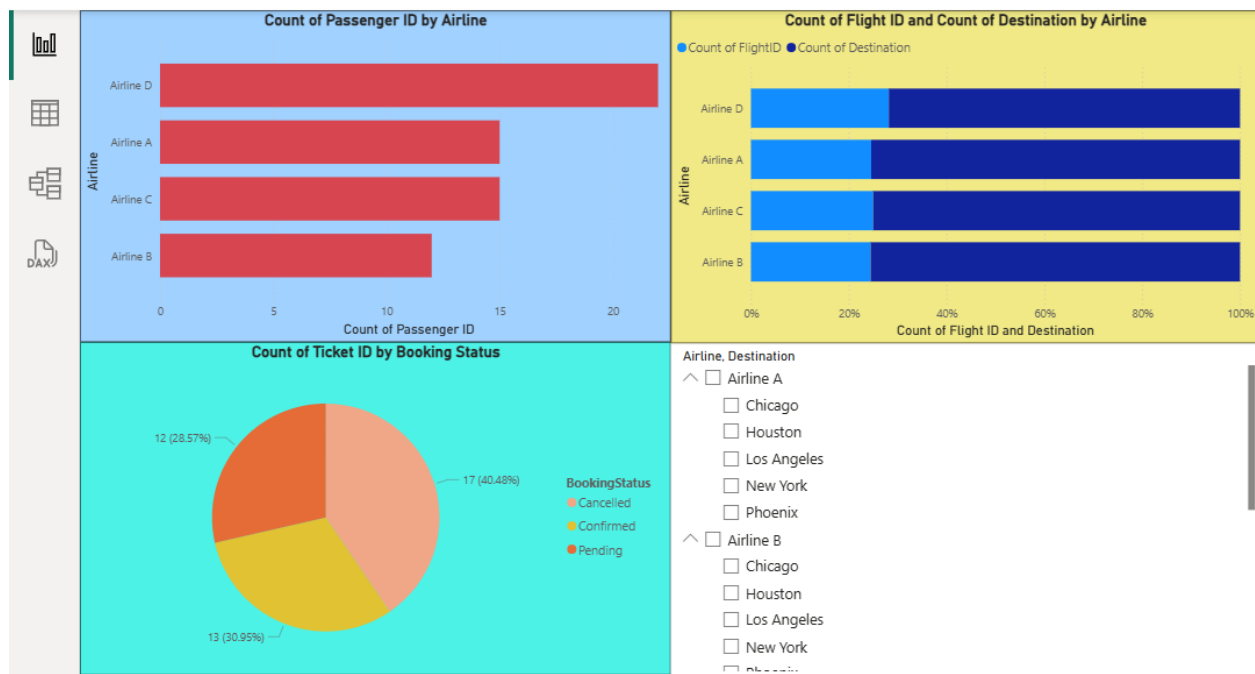
6. Final Dashboard and Power BI Service (20 Marks)

- Design a comprehensive dashboard with key visuals and insights.

- Configure Row-Level Security (RLS) for Airline A data and assign it to a user.
- Setup a schedule refresh at 5 PM daily.
- Deliverables: Screenshot of the published dashboard and RLS configuration.

Screenshots:-

Published Dashboards:-



RLS Role Setup:-

Manage security roles

×

Create new security roles and use filters to define row-level data restrictions.

Roles

+ New

Untitled...

Select tables

flight_informat...
passenger_inf...
ticket_informat...

Filter data

Switch to DAX editor

+ New

Deselect all

Delete

Group

Ungroup

Show data if

All

 of these rules are true

	Column	Condition	Value	
<div>⋮</div>	<div>✓</div> Airline	Equals	Destination	<div>⋮</div> <div>🗑</div>

+ New

Save

Close

Manage security roles

×

Create new security roles and use filters to define row-level data restrictions.

Roles

+ New

Untitled...

Select tables

flight_informat...
passenger_inf...
ticket_informat...

Filter data

Switch to DAX editor

+ New

Deselect all

Delete

Group

Ungroup

Show data if

All

 of these rules are true

	Column	Condition	Value	
<div>⋮</div>	<div>✓</div> FlightID	Equals	1000	<div>⋮</div> <div>🗑</div>

+ New

Save

Close

Manage security roles



Create new security roles and use filters to define row-level data restrictions.

Roles

+ New

Untitled ...

Select tables

- flight_informat...
- passenger_inf...
- ticket_informat...

Filter data

Switch to DAX editor

+ New Select all Delete Group Ungroup

Show data if All of these rules are true

Column	Condition	Value
<input type="checkbox"/> BookingStatus	Equals	FlightID
+ New		

Save

Close

Scheduled Refresh:-

