

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.

OUTPUT:

FlightID	Airline	Destination	Status
1001	Airline D	Houston	On Time
1002	Airline B	Chicago	On Time
1003	Airline A	New York	Cancelled
1004	Airline C	Chicago	Delayed
1005	Airline C	New York	Delayed
1006	Airline A	Phoenix	On Time
1007	Airline C	Los Angeles	Cancelled
1008	Airline C	Los Angeles	Delayed
1009	Airline A	Los Angeles	Cancelled
1010	Airline D	Chicago	Cancelled
1011	Airline A	Phoenix	On Time
1012	Airline D	New York	Delayed
1013	Airline C	Houston	On Time
1014	Airline C	New York	Delayed
1015	Airline C	Houston	Delayed
1016	Airline B	New York	Delayed
1017	Airline D	Phoenix	Delayed
1018	Airline B	Houston	Delayed
1019	Airline B	Chicago	Cancelled
1020	Airline A	New York	On Time
1021	Airline B	New York	Cancelled
1022	Airline A	Houston	Delayed

TicketID	BookingStatus
5001	Pending
5002	Confirmed
5003	Cancelled
5004	Cancelled
5005	Cancelled
5006	Pending
5007	Pending
5008	Cancelled
5009	Cancelled
5010	Cancelled
5011	Pending
5012	Cancelled
5013	Cancelled
5014	Confirmed
5015	Confirmed
5016	Pending
5017	Cancelled
5018	Cancelled
5019	Confirmed
5020	Pending
5021	Confirmed
5022	Confirmed

PassengerID	FlightID	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	7	1082 10A
8	8	1115 20E
9	9	1197 34E
10	10	1047 2E
11	11	1153 43C
12	12	1194 48C
13	13	1010 47A
14	14	1056 23C
15	15	1030 16D
16	16	1109 40D
17	17	1005 25C
18	18	1119 32C
19	19	1033 27E
20	20	1118 32B
21	21	1065 19E
22	22	1146 5B

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STEPS:

Load all 3 excel files into PowerBi desktop > Go to Transform data

In power query editor, select flight_information table

- Remove blank columns > select all the blank columns > home > remove columns
- Select all (CTRL + A) > Remove duplicates if any
- Check the data types formatted are correct. (left most of each header e.g. text or whole number)

Select ticket_information table

- Remove blank columns > select all the blank columns > home > remove columns
- Select all (CTRL + A) > Remove duplicates if any
- Check the data types formatted are correct. (left most of each header e.g. text or whole number)

Select passenger_information table

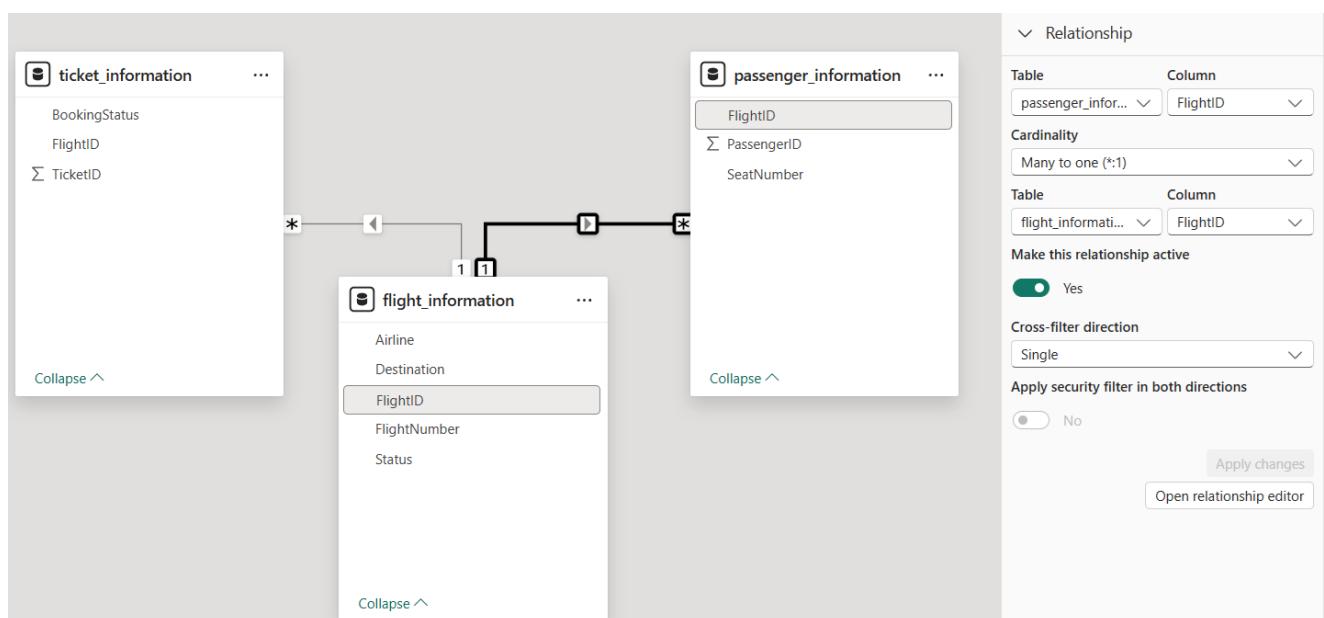
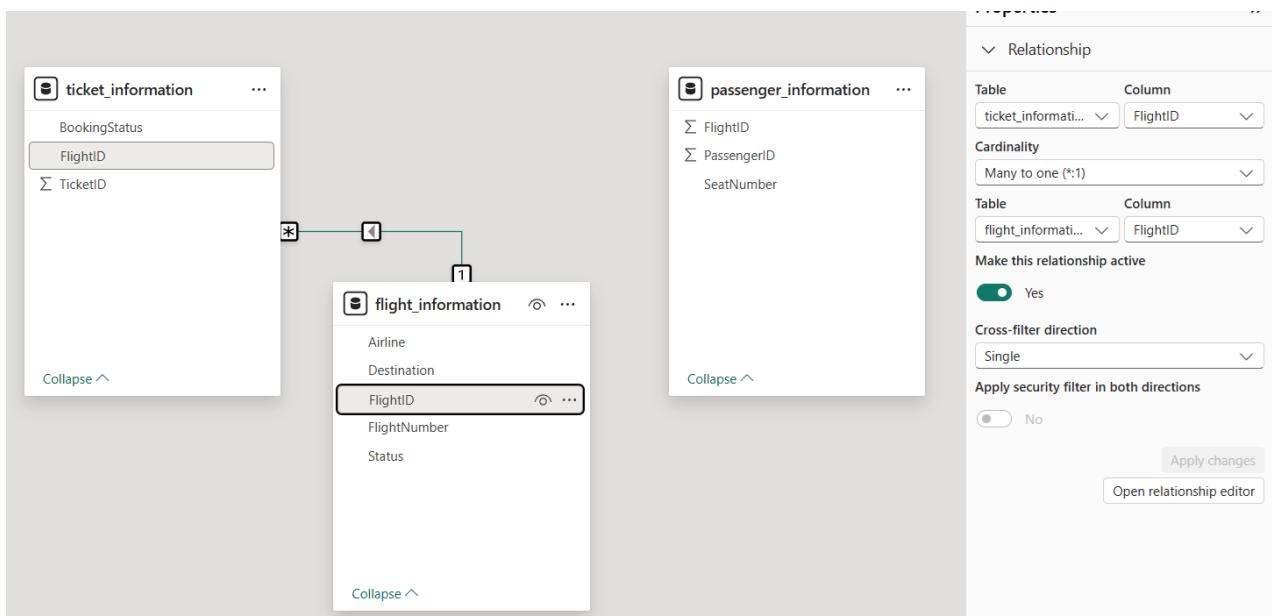
- Remove blank columns > select all the blank columns > home > remove columns
- Select all (CTRL + A) > Remove duplicates if any
- Check the data types formatted are correct. (left most of each header e.g. text)
- Trim whitespace: Select SeatNumber column > Transform tab > Format > Trim

Close & Apply

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.

OUTPUT:



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STEPS:

Go to Model View

Table	Key Column	Relationship Type
Flight_Information	FlightID (PK)	One (each flight is unique)
Passenger_Information	FlightID (FK)	Many (many passengers per flight)
Ticket_Information	FlightID (FK)	Many (many tickets per flight)

So we will:

- Connect Flight_Information[FlightID] > Passenger_Information[FlightID]
- Connect Flight_Information[FlightID] > Ticket_Information[FlightID]

Relationship type: **One to Many** > Cross Filter Direction: **Single**

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.

OUTPUT:

A ^b _c Airline	A ^b _c Destination	A ^b _c Status	A ^b _c Flight_Category	A ^b _c FlightNumber_Code
Airline D	Houston	On Time	Best	1102
Airline B	Chicago	On Time	Best	1435
Airline A	New York	Cancelled	To Be Improved	1860
Airline C	Chicago	Delayed	To Be Improved	1270
Airline C	New York	Delayed	To Be Improved	1106
Airline A	Phoenix	On Time	Best	1071
Airline C	Los Angeles	Cancelled	To Be Improved	1700
Airline C	Los Angeles	Delayed	To Be Improved	1020
Airline A	Los Angeles	Cancelled	To Be Improved	1614
Airline D	Chicago	Cancelled	To Be Improved	1121
Airline A	Phoenix	On Time	Best	1466
Airline D	New York	Delayed	To Be Improved	1214
Airline C	Houston	On Time	Best	1330
Airline C	New York	Delayed	To Be Improved	1458
Airline C	Houston	Delayed	To Be Improved	1087
Airline B	New York	Delayed	To Be Improved	1372
Airline D	Phoenix	Delayed	To Be Improved	1099
Airline B	Houston	Delayed	To Be Improved	1871
Airline B	Chicago	Cancelled	To Be Improved	1663
Airline A	New York	On Time	Best	1130
Airline B	New York	Cancelled	To Be Improved	1661

STEPS:

1. Open Power Query Editor > Click on Flight_Information table on the left.
2. Go to Add Column > Conditional Column > In the dialog:
 - New column name: **Flight_Category**
 - Column name: Status
 - Operator: equals
 - Value: On Time
 - Output: Best
 - Else output: To Be Improved
3. Click OK.

Extract the Flight Number using "Column from Examples"

1. With Flight_Information still selected, Go to Add Column > Column from Examples > From Selection.
2. Select the FlightNumber column.
3. In the new column area, manually type the Flight Number part (like just "1102" if full value is "FL1102") for a few rows.
4. Power BI will detect the pattern and fill the column automatically.
5. Click OK once it's correct.
6. Right click on that column > Rename > Rename the column to "FlightNumber_Code"
7. Home > Close & Apply

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.

OUTPUT:

Total passengers for a specific flight.

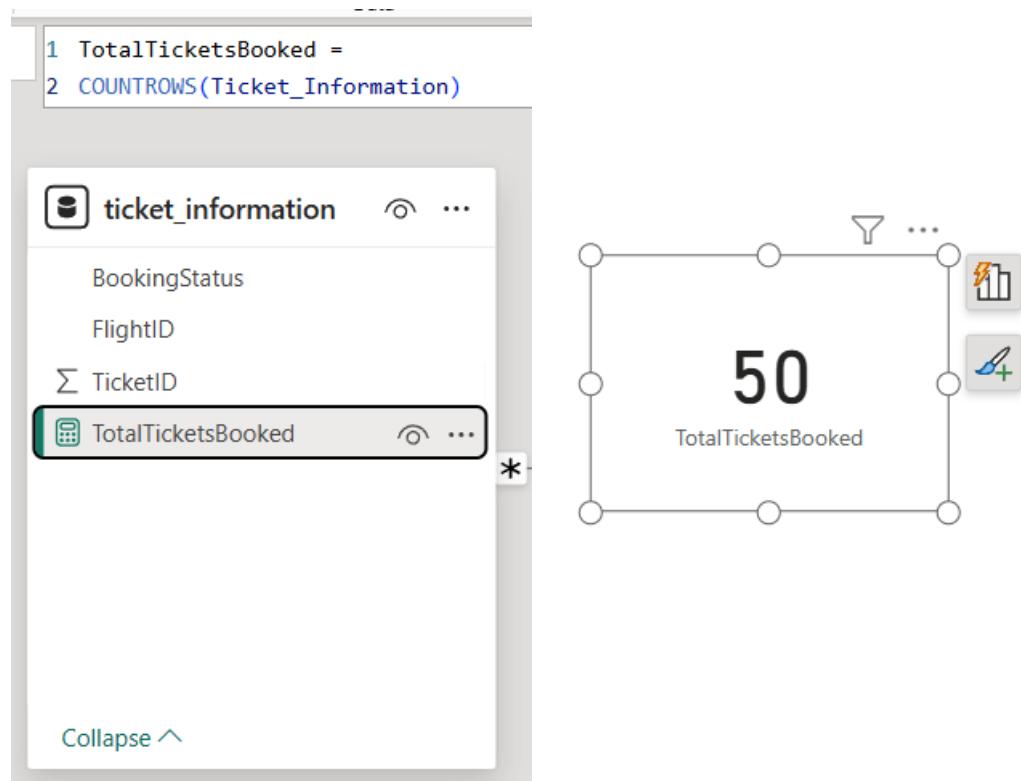
The screenshot shows the Power BI Data View interface. A table named 'flight_information' is displayed with the following columns: Airline, Destination, Flight_Category, FlightID, FlightNumber, FlightNumber_Code, Status, and Total Passengers. The 'Total Passengers' column is highlighted with a blue border. At the bottom left of the table area, there is a 'Collapse ^' button.

1 Total Passengers = COUNTROWS(RELATEDTABLE(passenger_information))

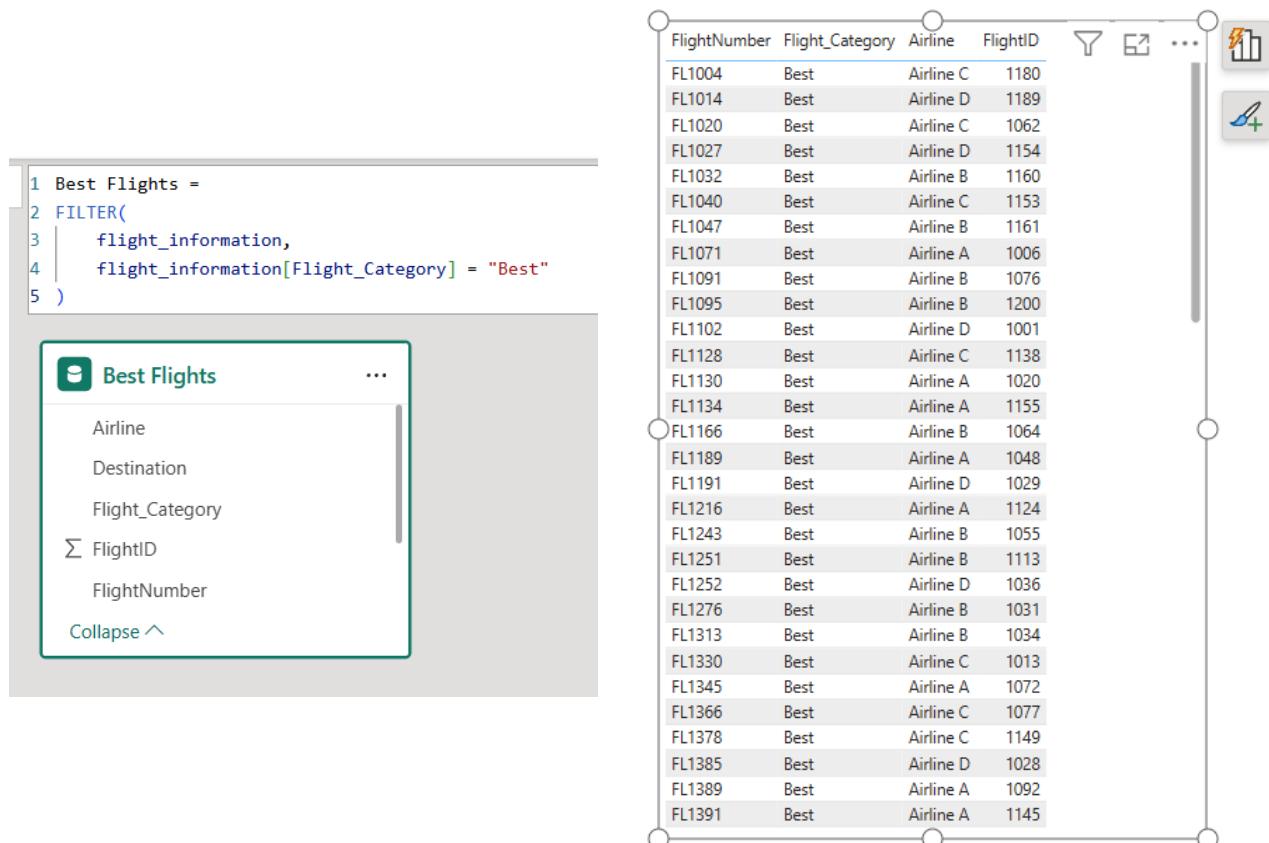
The screenshot shows the Power BI Data View interface. On the left, a table titled 'FlightID' is displayed with two columns: FlightID and Total Passengers. The data shows various flight IDs with their corresponding passenger counts, ending with a total row of 100. On the right, a visual representation of the DAX calculation is shown. It consists of a central large number '2' labeled 'Total Passengers'. Four lines radiate from this center to four small circles, which are connected by a horizontal line. From each of these four circles, another line extends to four smaller circles arranged in a square pattern. This visual is likely a simplified diagram of the data flow or a calculated field structure.

FlightID	Total Passengers
1197	2
1194	1
1193	2
1192	1
1191	1
1190	1
1182	1
1181	1
1179	2
1177	2
1173	1
1166	1
1165	1
1162	1
1161	2
1157	1
1154	1
1153	1
1151	1
1149	1
1146	1
1145	2
1142	1
Total	
100	

Total tickets booked.



Filtered table showing "Best" flights only.



STEPS:

Total passengers for a specific flight.

- Go to **Model view** > select **flight_information** table > **New Measure** > Total Passengers = COUNTROWS(RELATEDTABLE(passenger_information))
- In **Report View**, go to **Visualizations** > select table visual
- Drag FlightID and Total Passengers from **Flight_Information**
- For better and clear visual add **CARD** visual and drag Total Passengers from **Flight_Information**

Total tickets booked.

- Go to **Model view** > select **ticket_information** table > **New Measure** > TotalTicketsBooked = COUNTROWS(Ticket_Information)
- In **Report View**, go to **Visualizations** > select card visual
- Drag TotalTicketsBooked from **ticket_information**

Filtered table showing "Best" flights only.

- Go to Model view > New Table >
Best Flights =
FILTER(
 flight_information,
 flight_information[Flight_Category] = "Best"
)
- In Report View, go to Visualization > select TABLE visual
- Drag FlightID, FlightNumber, Flight_Category, Airline from Best Flights table

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.

OUTPUT:

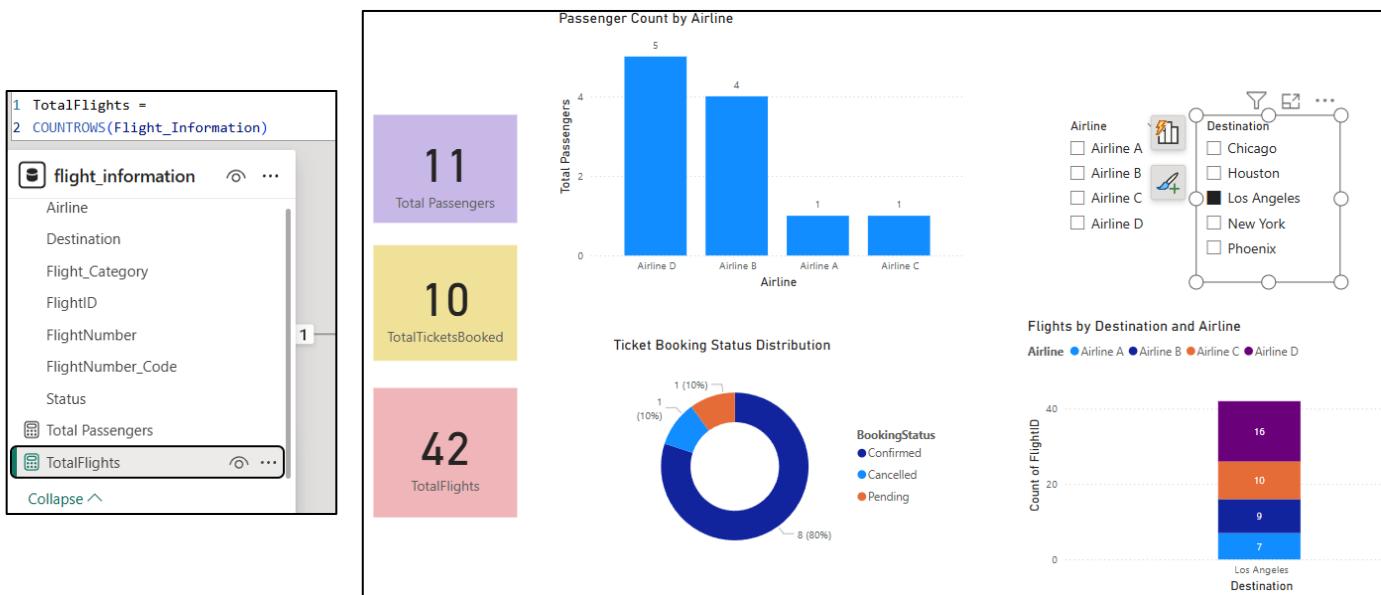


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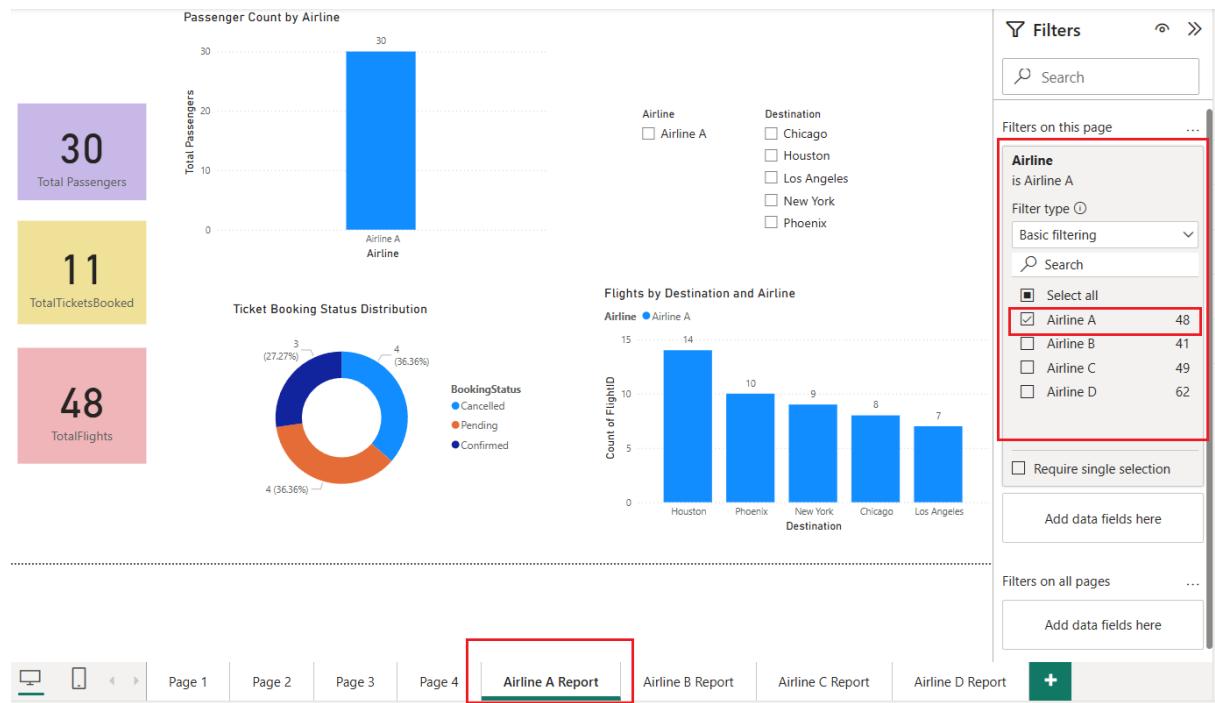
Add interactive features for: Destination and Airline.



Add interactive features for: Quick Views



Add interactive features for: Airline-specific pages.



STEPS:

Passenger Count per Airline

1. Click "**Stacked Column Chart**" from the Visualizations pane.
2. Drag:
 - o **X-axis**: Airline (from flight_information)
 - o **Y-axis**: Total Passengers (DAX measure created in early task)
3. Format:
 - o Add data labels (turn on in the "Format" tab).
 - o Title: "**Passenger Count per Airline**".

Ticket booking statuses.

1. Go to Report View > Select Donut Chart (better for labels)
2. Add Fields
 - o Legend / Category: BookingStatus (from Ticket_Information)
 - o Values: Count of **TicketID**
3. Format > Title : "**Ticket Booking Status Distribution**"

Flights by airline and destination.

1. Go to **Report View** > Select **Stacked Column Chart** (from Visualizations pane)
2. **Add Fields**
 - o **Axis**: Destination (from Flight_Information)
 - o **Legend**: Airline
 - o **Values**: Count of FlightID
3. Format:
 - o Add data labels (turn on in the "Format" tab).
 - o Title: "**Flights by Destination and Airline**"

Add interactive features for: Destination and Airline.

1. In Report View, Select Slicer from the Visualizations pane.
2. Drag the Destination field (from Flight_Information) into the slicer.
3. Repeat the same to create another slicer for Airline.

Add interactive features for: Quick Views

1. **Go to Modeling** > In Flight_Information table create **New Measure** > **TotalFlights** = COUNTROWS(Flight_Information)
2. Go to **Report View** > Select **Card** from the Visualizations pane (1 for each)
3. Add these three one by one:
 - o Card 1: TotalPassengers
 - o Card 2: TotalTicketsBooked
 - o Card 3: TotalFlights

Add interactive features for: Airline-specific pages.

1. In Power BI, go to the **bottom page tabs** and **duplicate** your current report page:
 - o Right-click the tab > **Duplicate Page**
2. Rename the page, e.g., "**Airline A Report**"
3. Apply a **visual-level or page-level filter**:
 - o In the **Filters pane**, drag Airline into the **Page Filters** area.
 - o Select a specific airline (e.g., "Airline A")
4. Now all visuals on that page show data **only for that airline**.

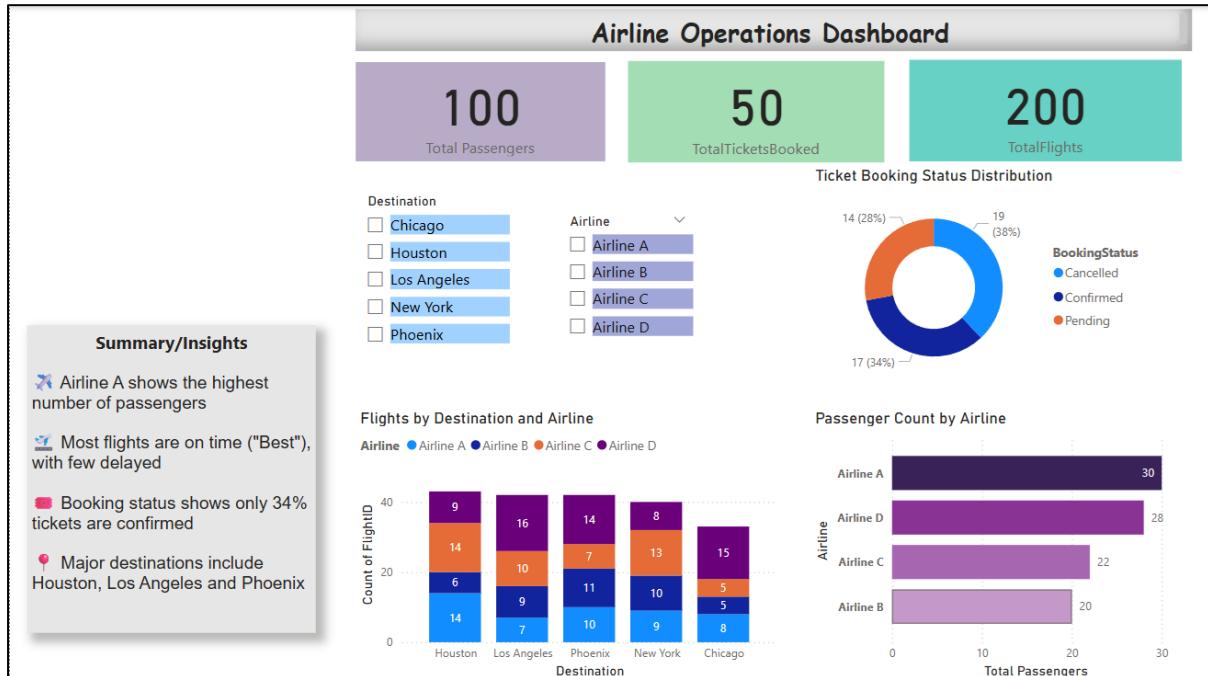
 You can repeat this process for **each airline** you want to spotlight.

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.
- Set up a schedule refresh at 5 PM daily.
- Deliverables: Screenshot of the published dashboard and RLS configuration.

OUTPUT:

Design a comprehensive dashboard with key visuals and insights.



Configure Row-Level Security (RLS) for Airline A data and assign it to a user.

The dialog shows a list of security roles, a table selection interface, and a filter editor.

Roles: AirlineRole

Select tables: Best Flights, flight_informat..., passenger_inf..., ticket_informat...

Filter data:

```
1 [Airline] = "Airline A"
```

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Row-Level Security

AirlineARole (1)	Members (1) People or groups who belong to this role Enter email addresses Add Aayush Shinde x
Save Cancel	

Set up a schedule refresh at 5 PM daily.

Refresh

Time zone

① Time zone configuration is applied not only to determine the schedule refresh time but also to establish incremental refresh models during on-demand and API refreshes. [Learn more](#)

(UTC+05:30) Chennai, Kolkata, Mumbai

Configure a refresh schedule

Define a data refresh schedule to import data from the data source into the semantic model

On

Refresh frequency

Daily

Time

5 ▾ 00 ▾ PM ▾ x

[Add another time](#)

STEPS:

1. Design a comprehensive dashboard with key visuals and insights.

Create a New Dashboard Page

- Click the "+" icon at the bottom to create a new report page.
- Rename it to "Dashboard" or "Main Report".

Add Key KPIs (Quick Views)

Use **Card visuals** to show high-level metrics:

- **Total Passengers** → using Total Passengers measure
- **Total Tickets Booked** → using TotalTicketsBooked measure
- **Total Flights** → using TotalFlights measure

Place them in a **row at the top** of the page.

Add Visuals

Use the visuals created earlier to present important trends:

Visual	Chart Type	Fields Used
Passenger Count by Airline	Bar or Column Chart	Airline, TotalPassengers
Ticket Booking Status	Donut or Pie Chart	BookingStatus, TicketID
Flights by Airline & Destination	Stacked Column Chart	Destination, Airline, FlightID

Position these below the KPI cards in a **clear grid layout**.

Add Slicers for Interactivity

Add **Slicer visuals** to allow filtering across visuals:

- Slicer 1: Airline
- Slicer 2: Destination

Format them as **dropdowns** and place on the **left**.

Add Dashboard Title

- Use **Insert > Text box**.
- Add a bold heading, e.g. **Airline Operations Dashboard**

Add Insights with Text Boxes.

2. Configure Row-Level Security (RLS) for Airline A data and assign it to a user.

In Power BI Desktop:

1. Go to **Model view > Manage Roles**
2. Click **Create > Role Name**: AirlineARole
3. In the table where Airline exists (likely Flight_Information), click it.
4. Set this DAX filter: [Airline] = "Airline A"
5. This will restrict all visuals to **only Airline A data** > Click **Save**.
6. Click Home > Publish > Choose a workspace

Assign RLS Role to a User (Power BI Service)

1. Go to <https://app.powerbi.com>
2. Navigate to the **Dataset** of your report.
3. Click the **three dots (…)** next to the dataset > **Security**

4. Under AirlineARole, add the user's **email address**
5. Now only data related to "Airline A" will be shown to that user.

3. Set up a schedule refresh at 5 PM daily.

In Power BI Service, At the Top right Click the **Settings** icon next to your dataset > PowerBi settings

In semantic Model > **Refresh**:

- Turn **Keep Data Updated → On**
- Click + Add another time
- Set it to: **5:00 PM**
- Choose **Time Zone = (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi**
- Set your **data source credentials** if prompted
- Apply