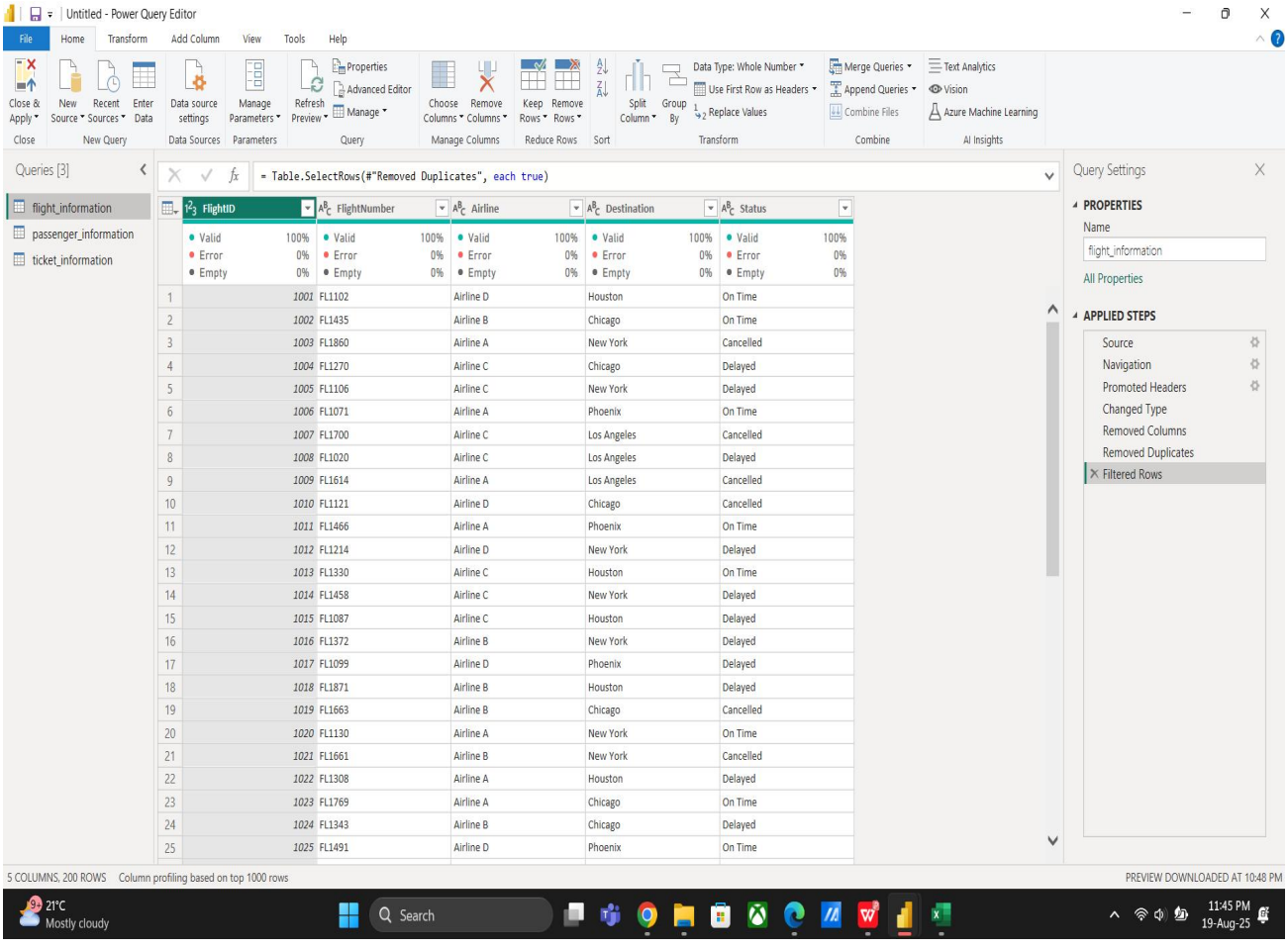
Project Title:
Airline Data Management and Analysis Using Power BI

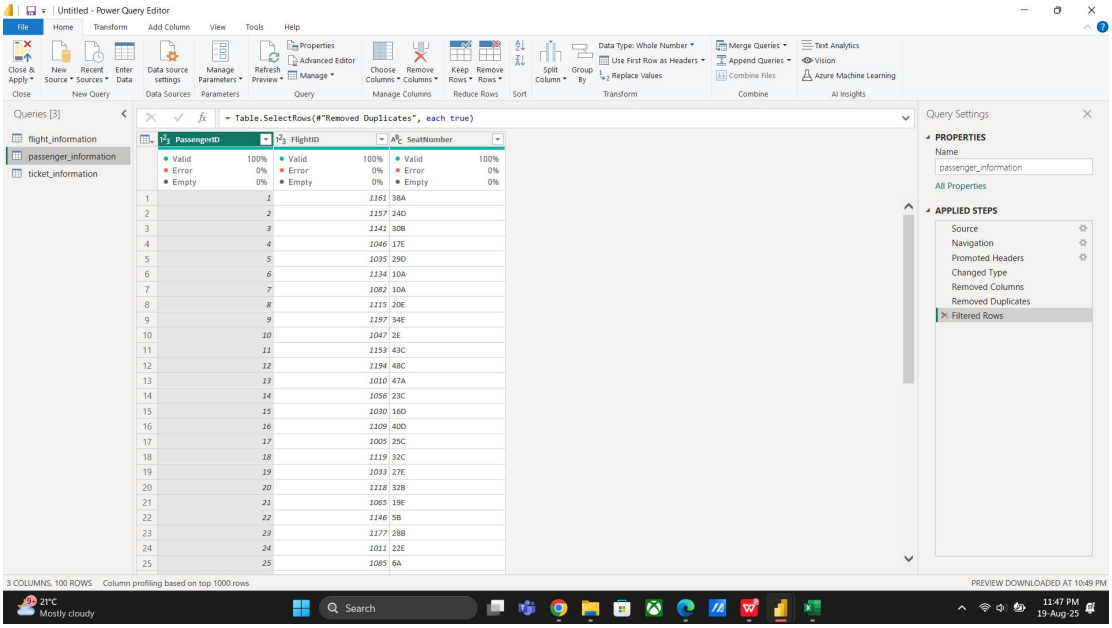
Problem Statement:
The airline industry operates with numerous complexities, requiring effective data management and insights into flight schedules,passenger details, and ticketing systems. This project aims to analyze airline operations for improving efficiency and customer satisfaction.

Objective:
To analyze and visualize airline data for operational insights, passenger management, and ticket booking trends using Power BI.

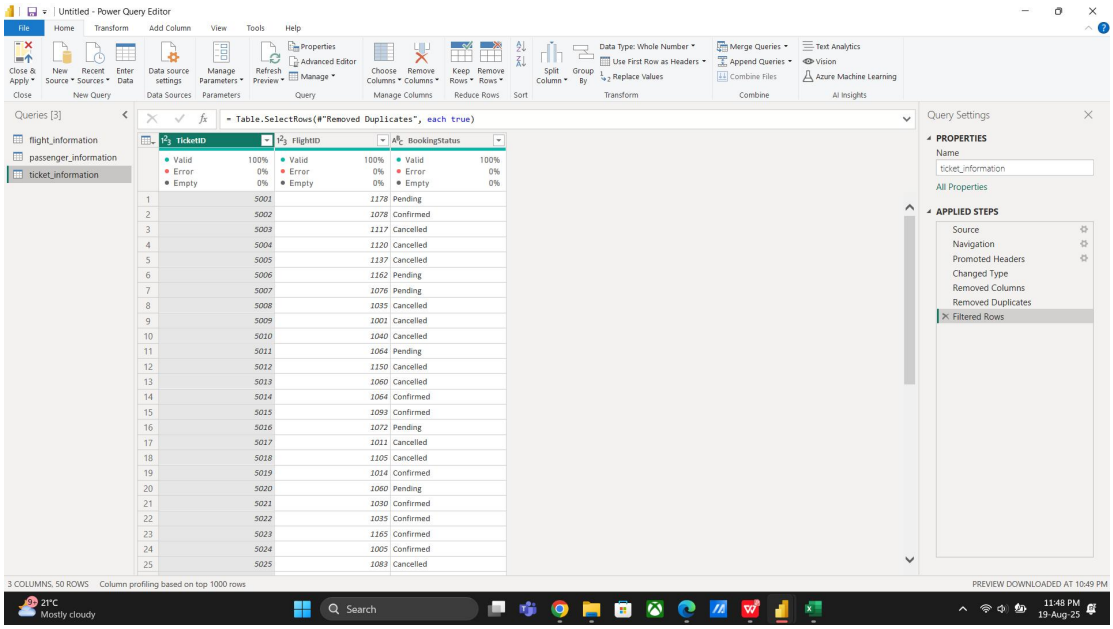
1. Data Preparation and Cleaning



Flight Imformation Transformation Screenshot



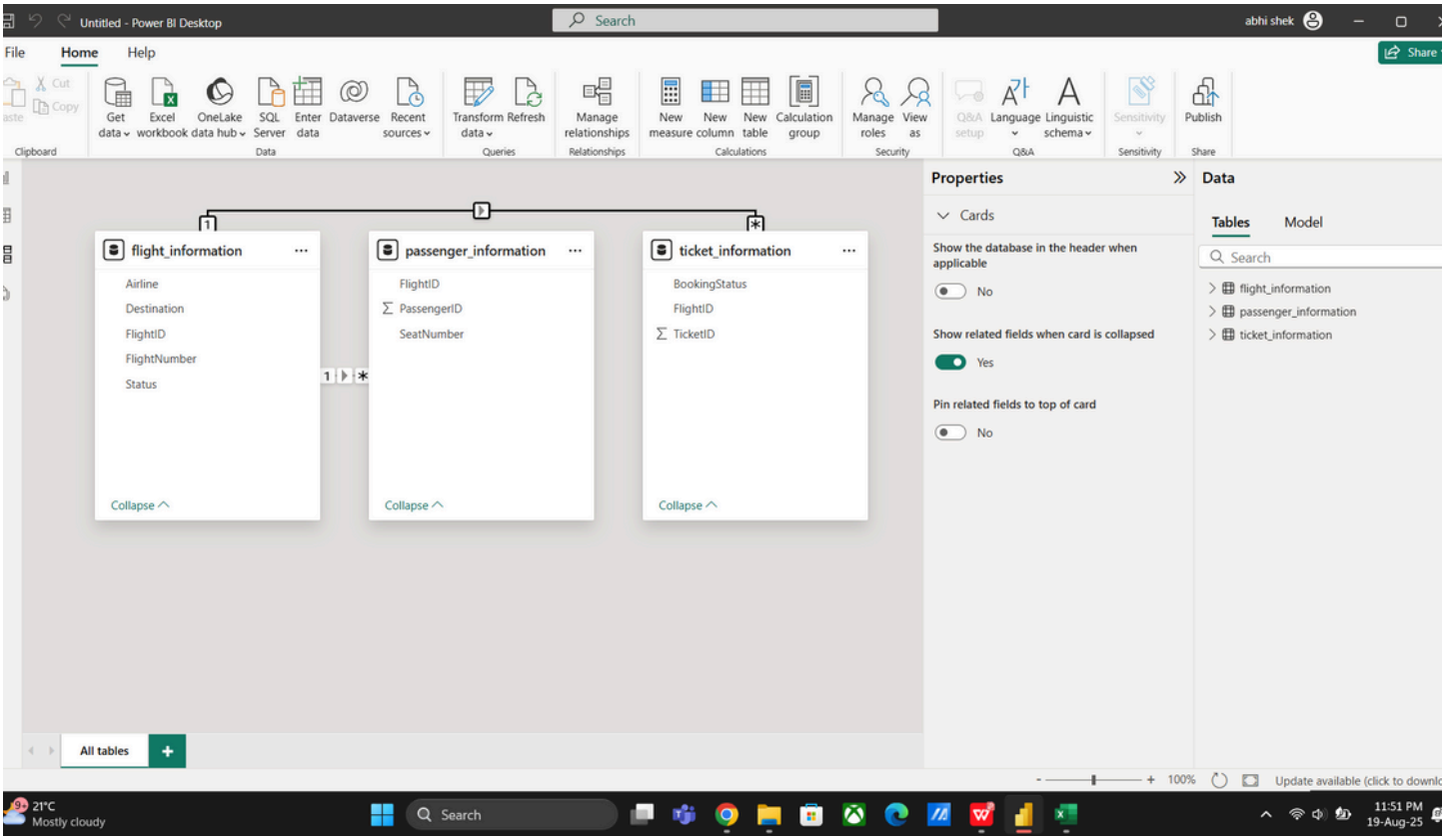
Passenger Imformation Transformation Screenshot



Ticket Imformation Transformation Screenshot

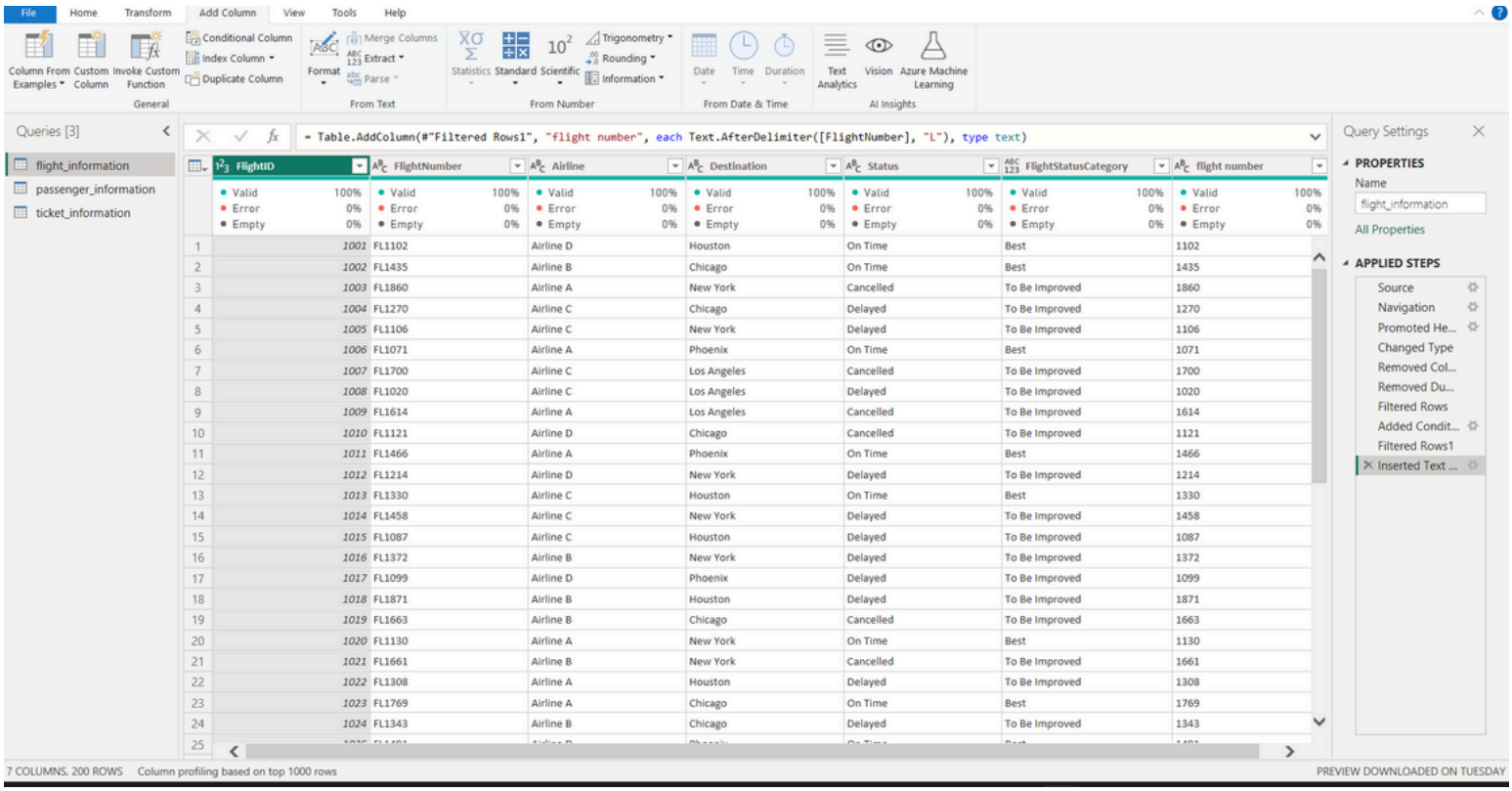
Summary
- No Duplicate records found in any of the data.
- Every Column has proper data types.
- No missing values found in any data.

2. Data Modeling



FlightID is a primary key in flight_imformation table and it is connected to passenger_imformation table and ticket_imformation table using foreign key which is flightID and It is connected by One to Many relationship.

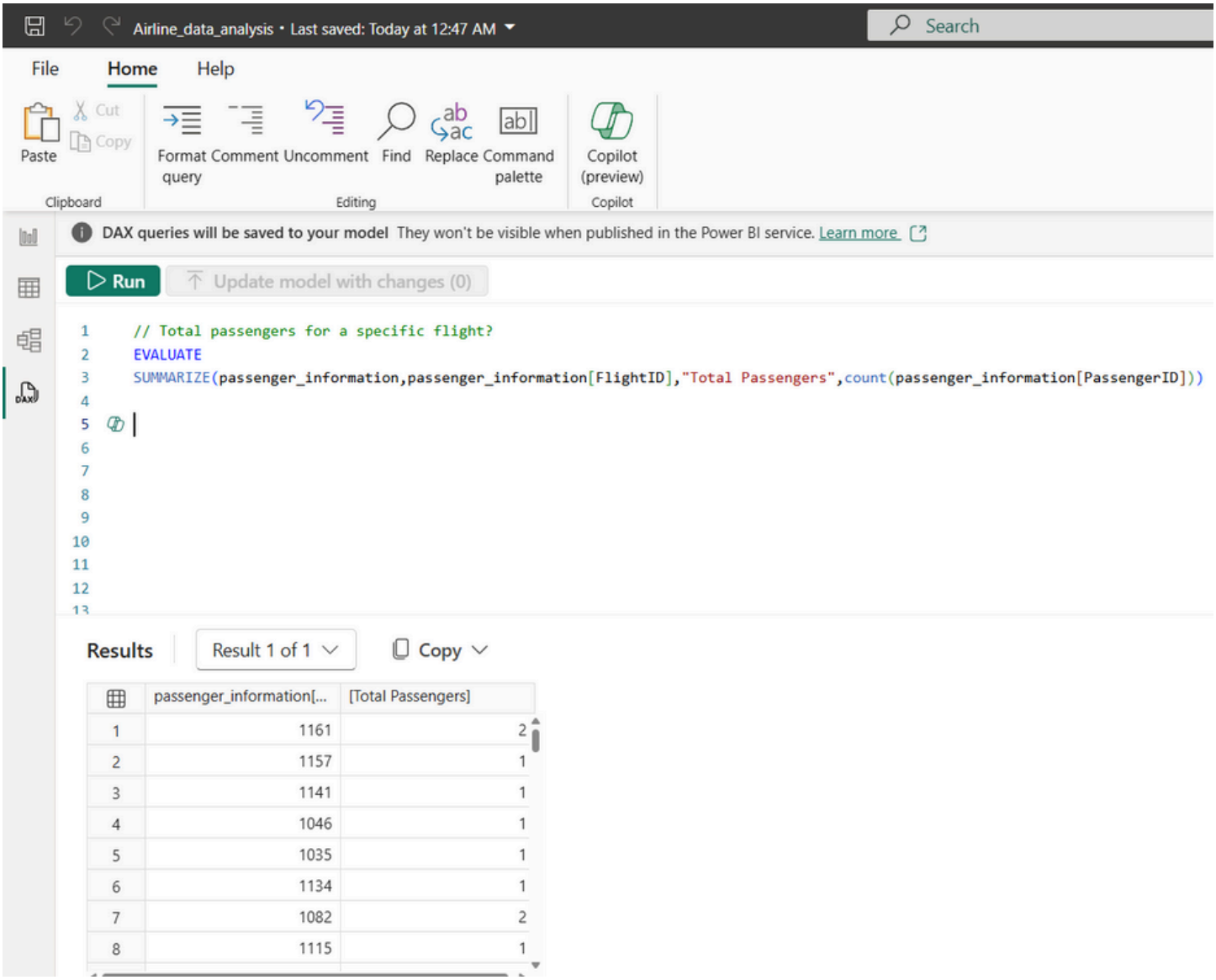
3. Enhanced Data Insights



	FlightID	FlightNumber	Airline	Destination	Status	FlightStatusCategory	flight number
1	1001	FL1102	Airline D	Houston	On Time	Best	1102
2	1002	FL1435	Airline B	Chicago	On Time	Best	1435
3	1003	FL1860	Airline A	New York	Cancelled	To Be Improved	1860
4	1004	FL1270	Airline C	Chicago	Delayed	To Be Improved	1270
5	1005	FL1106	Airline C	New York	Delayed	To Be Improved	1106
6	1006	FL1071	Airline A	Phoenix	On Time	Best	1071
7	1007	FL1700	Airline C	Los Angeles	Cancelled	To Be Improved	1700
8	1008	FL1020	Airline C	Los Angeles	Delayed	To Be Improved	1020
9	1009	FL1614	Airline A	Los Angeles	Cancelled	To Be Improved	1614
10	1010	FL1121	Airline D	Chicago	Cancelled	To Be Improved	1121
11	1011	FL1466	Airline A	Phoenix	On Time	Best	1466
12	1012	FL1214	Airline D	New York	Delayed	To Be Improved	1214
13	1013	FL1330	Airline C	Houston	On Time	Best	1330
14	1014	FL1458	Airline C	New York	Delayed	To Be Improved	1458
15	1015	FL1087	Airline C	Houston	Delayed	To Be Improved	1087
16	1016	FL1372	Airline B	New York	Delayed	To Be Improved	1372
17	1017	FL1099	Airline D	Phoenix	Delayed	To Be Improved	1099
18	1018	FL1871	Airline B	Houston	Delayed	To Be Improved	1871
19	1019	FL1663	Airline B	Chicago	Cancelled	To Be Improved	1663
20	1020	FL1130	Airline A	New York	On Time	Best	1130
21	1021	FL1661	Airline B	New York	Cancelled	To Be Improved	1661
22	1022	FL1308	Airline A	Houston	Delayed	To Be Improved	1308
23	1023	FL1769	Airline A	Chicago	On Time	Best	1769
24	1024	FL1343	Airline B	Chicago	Delayed	To Be Improved	1343

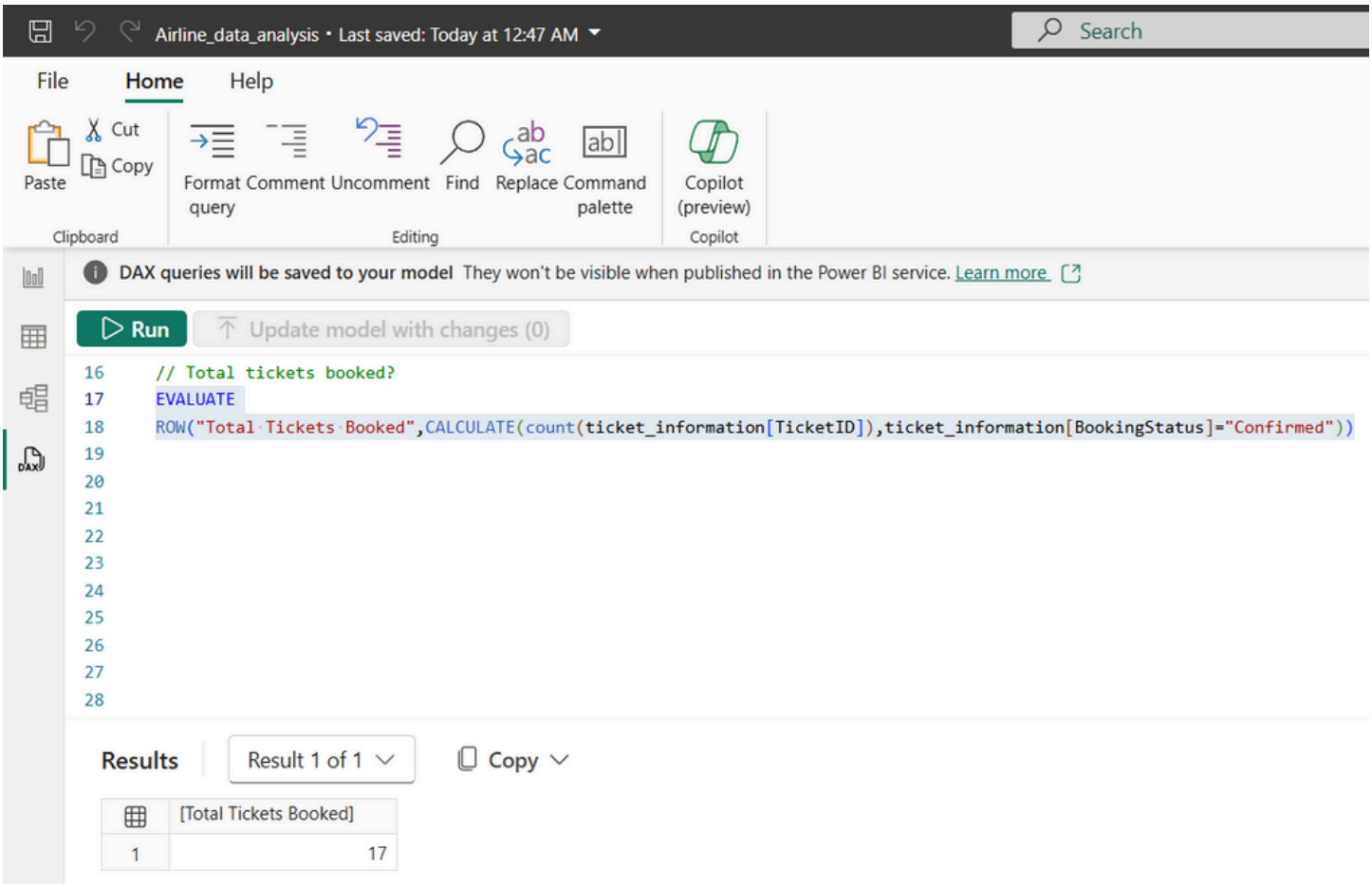
flights were categorized into “Best” and “To Be Improved” category in FlightStatusCategory and flight number was extracted from FlightNumber Column.

4. Calculations Using DAX

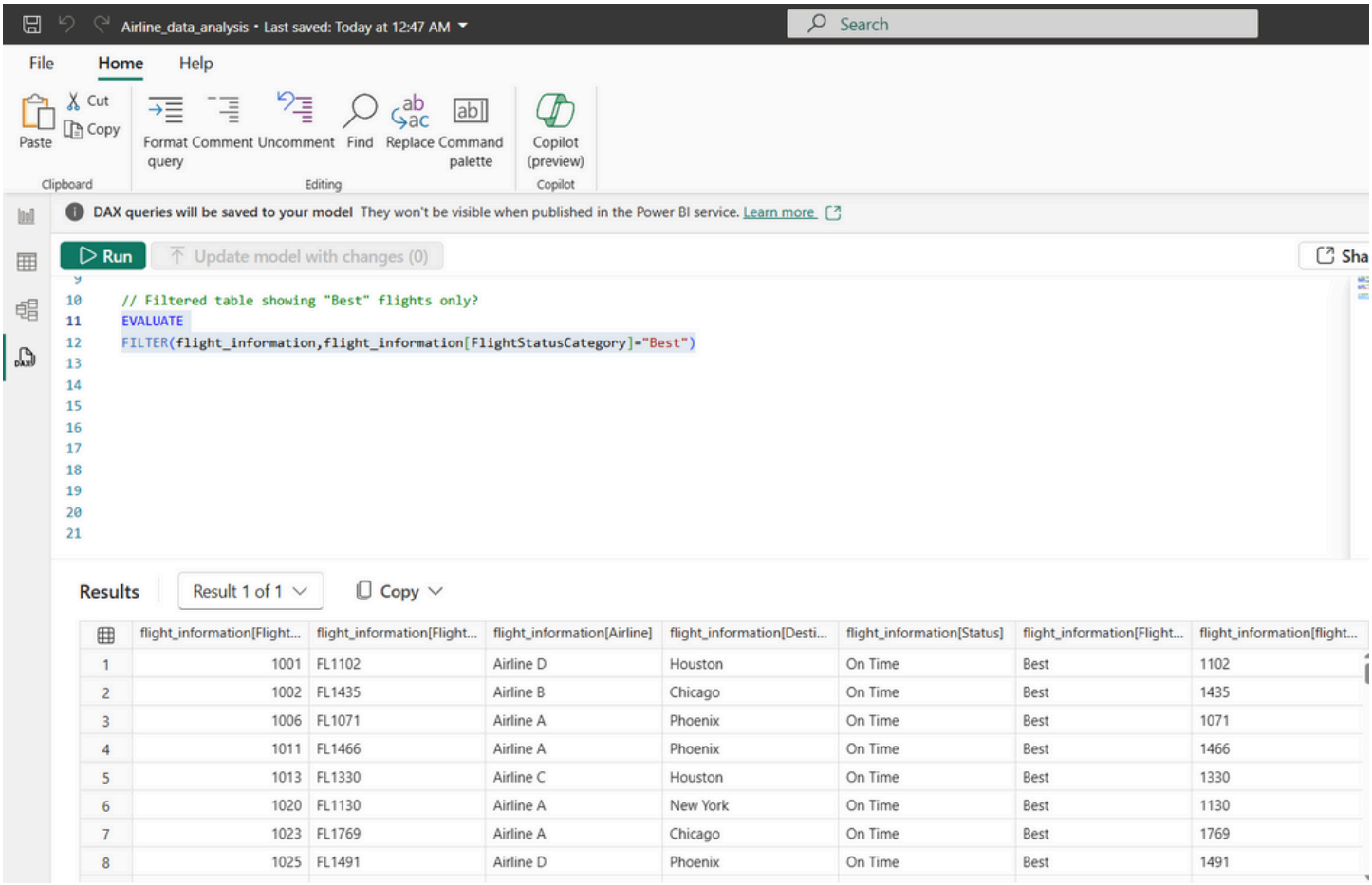


	passenger_information[...	[Total Passengers]
1	1161	2
2	1157	1
3	1141	1
4	1046	1
5	1035	1
6	1134	1
7	1082	2
8	1115	1

Calculated number of passenger for each flight.

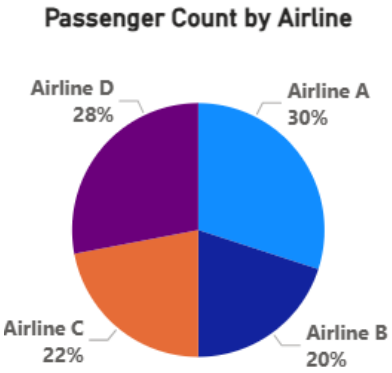


Total Tickets Booked

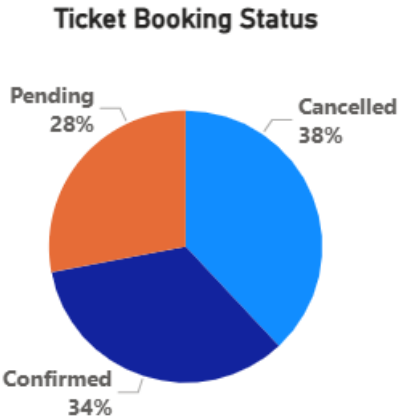


Filtered out Best flights

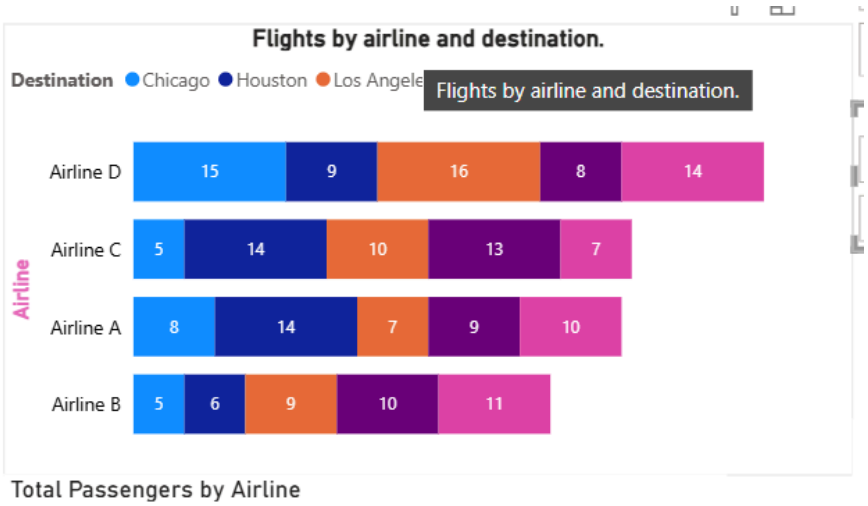
5. Visualization and Interactive Features



Insights: Airline A has constitute almost 30% of passengers which is maximum among all the airlines.Airline B has lowest number of passengers.



Insights: Most of the tickets have been cancelled and also in pending status which means that the platform in which ticket is booked offers really poor service.

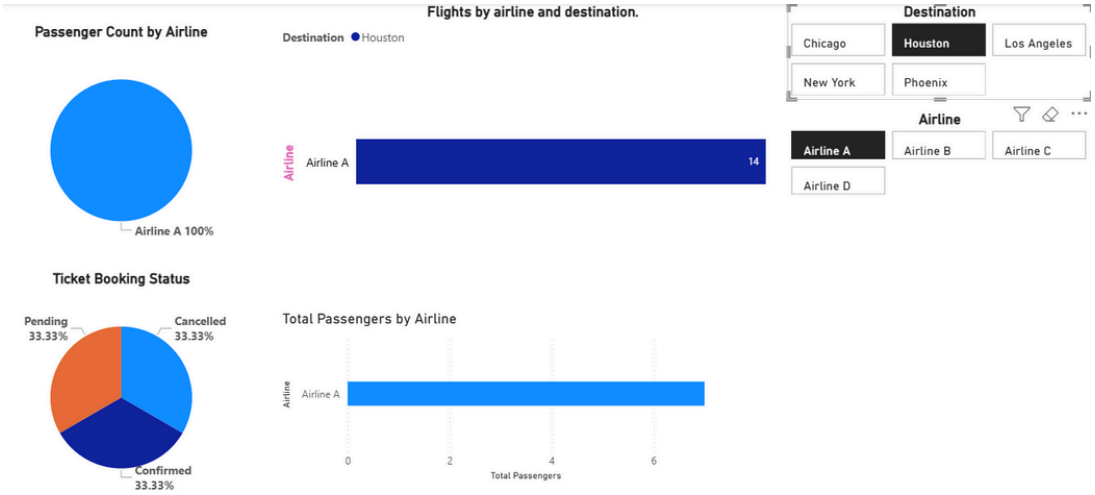


Insights: In Airline D, most of the flights gone to Los Angeles.similarly in Airline C majourity of the flights went to Houston.Similarly in Airline A Most of the flights went to Houston.Airline B Maximum flights went to New York.

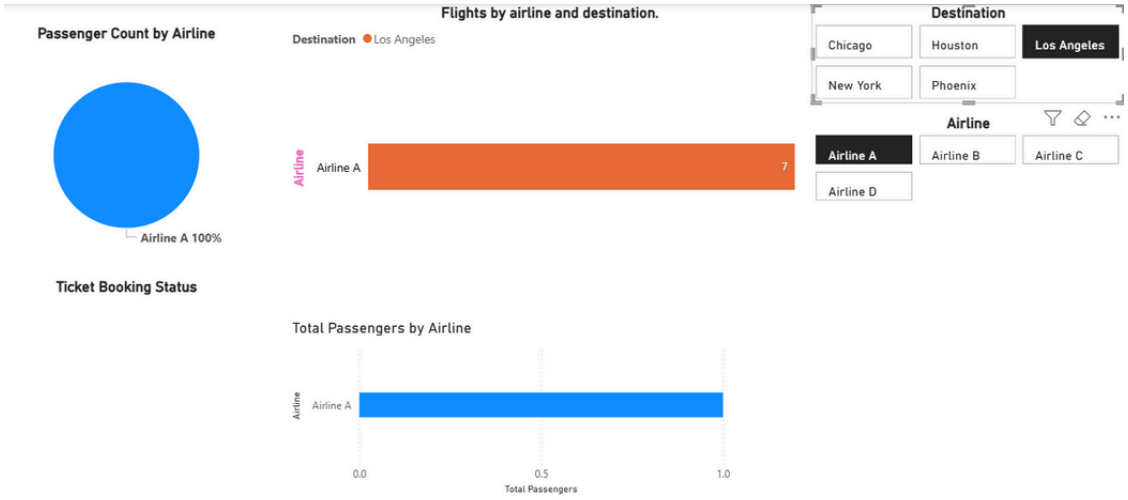
Add interactive features for:

- **Destination and Airline:** Added Slicers for Destination and Airlines.

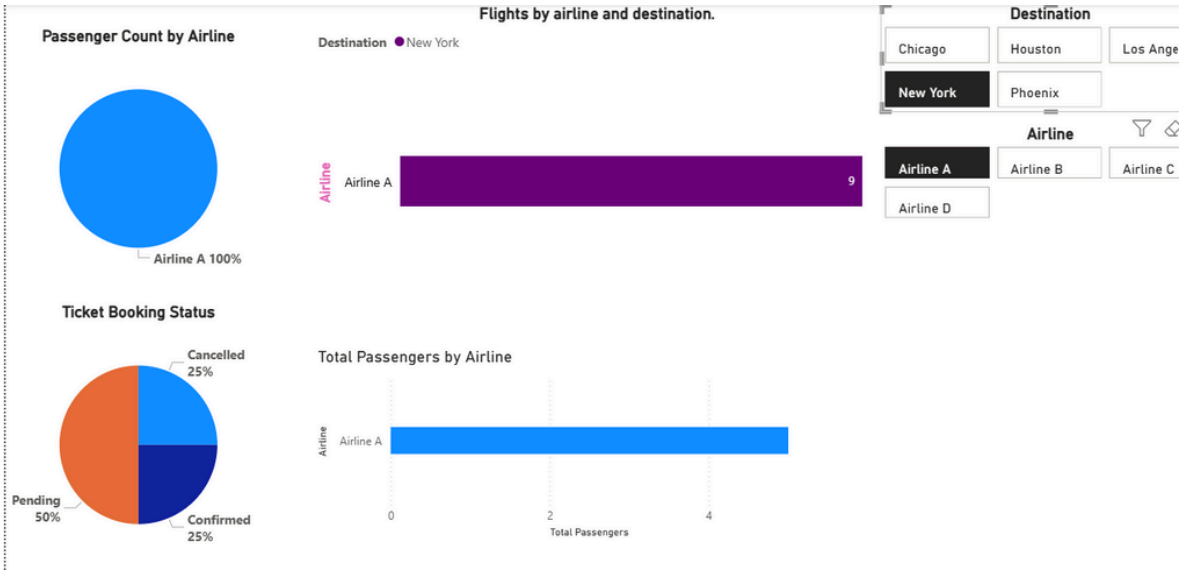
Airline A and Chicago Filters



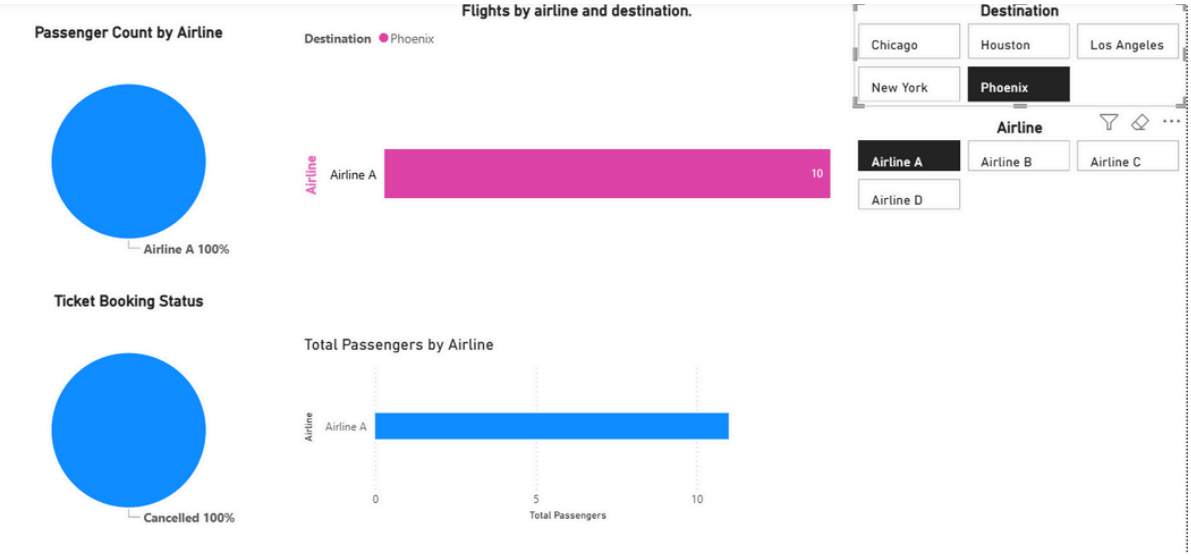
Airline A and Houston filter



Airline A and Los Angeles Filter

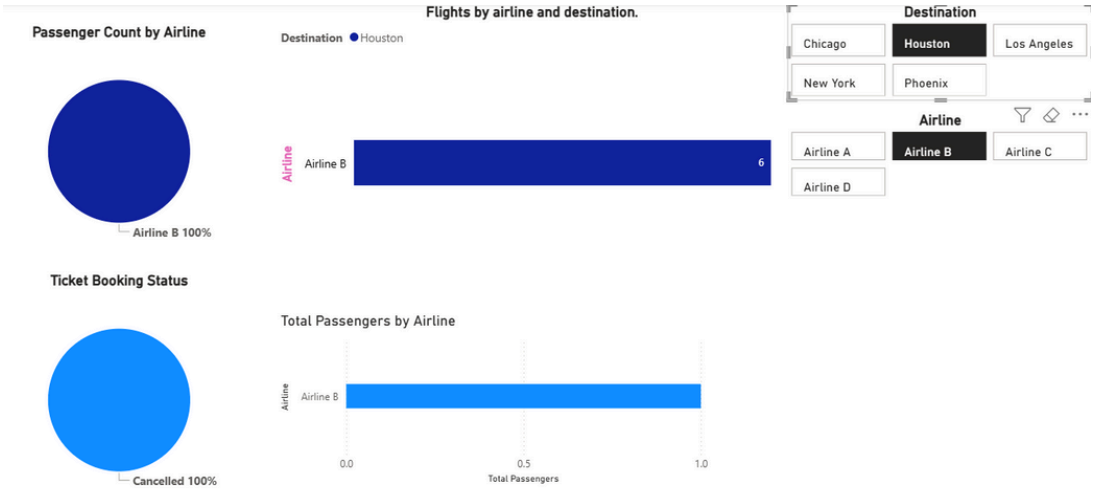


Airline A and New York Filter

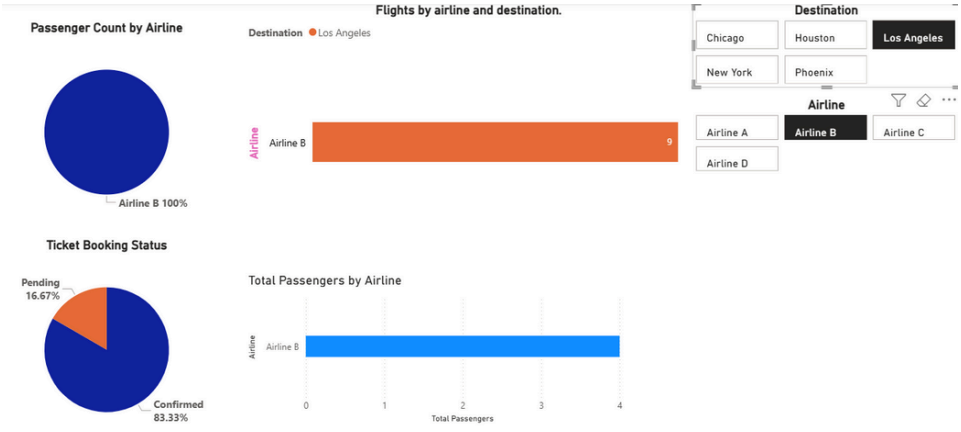


Airline A and Phoenix Filter

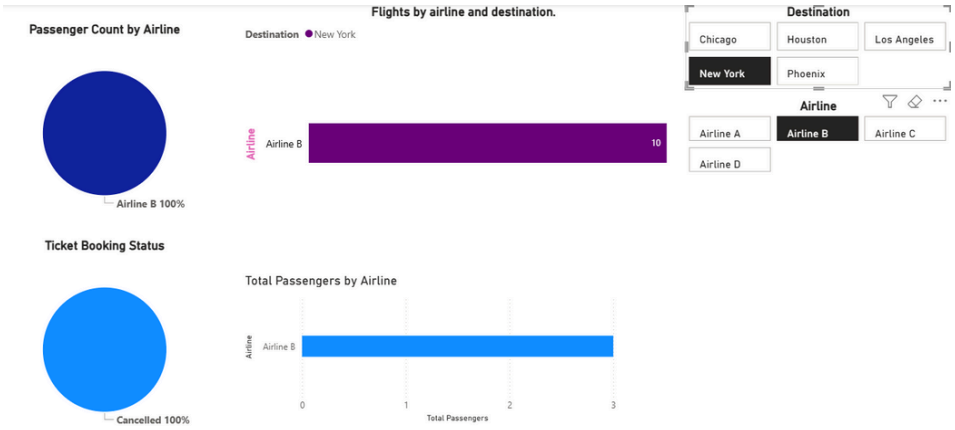
Airline B and Chicago fiilter



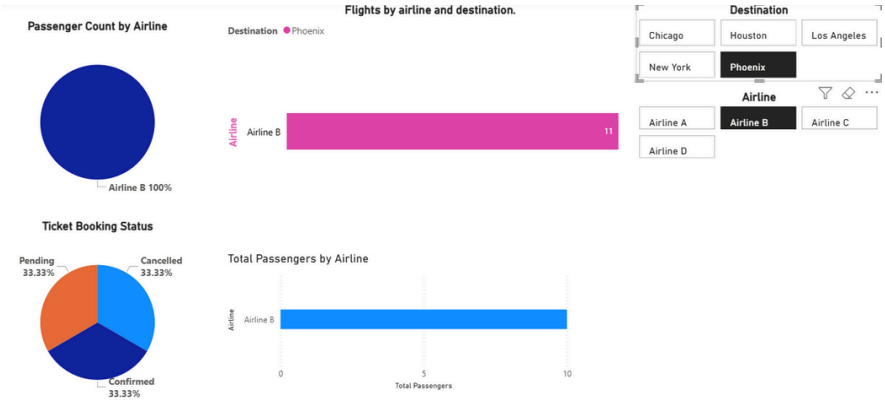
Airline B and Houston Filter



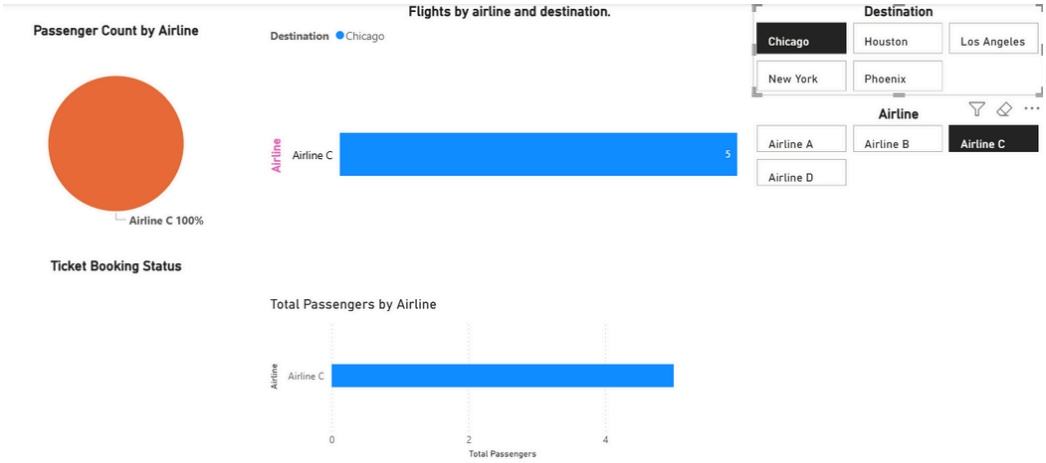
Airline B and Los Angeles Filter



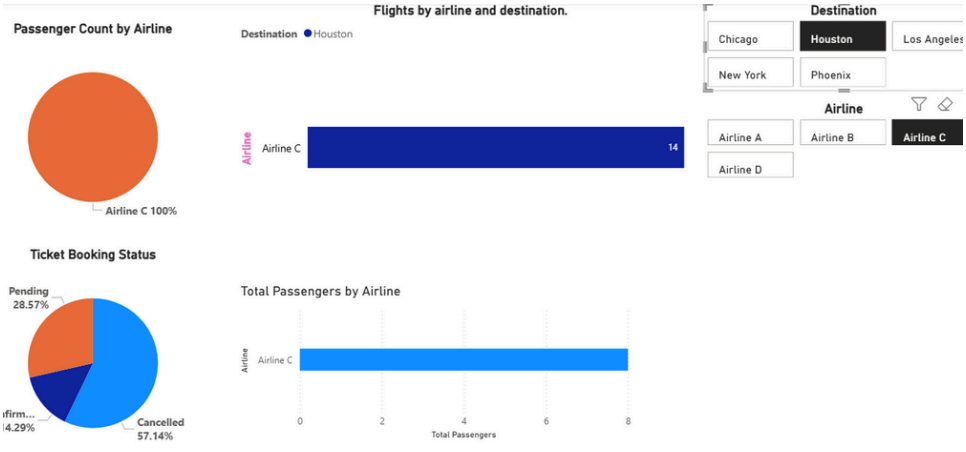
Airline B and New York filter



Airline B and Phoenix

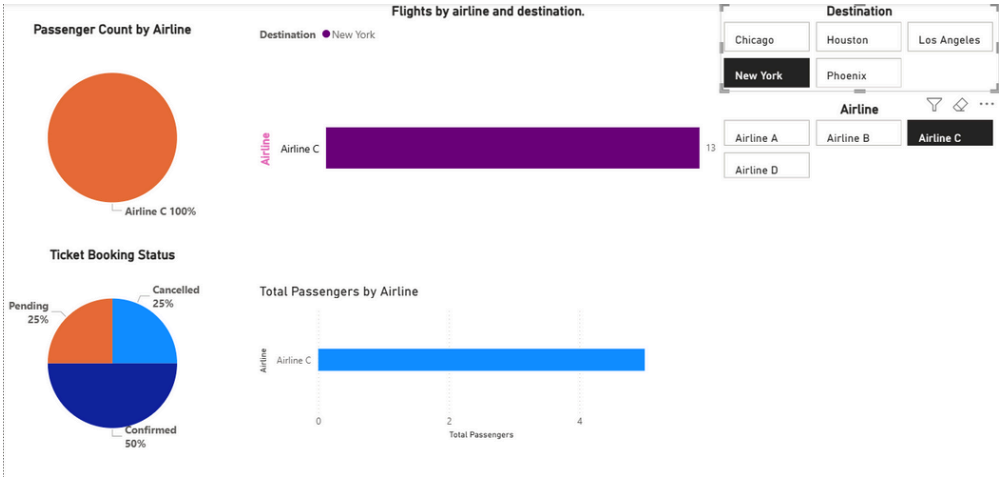


Airline C and Chicago

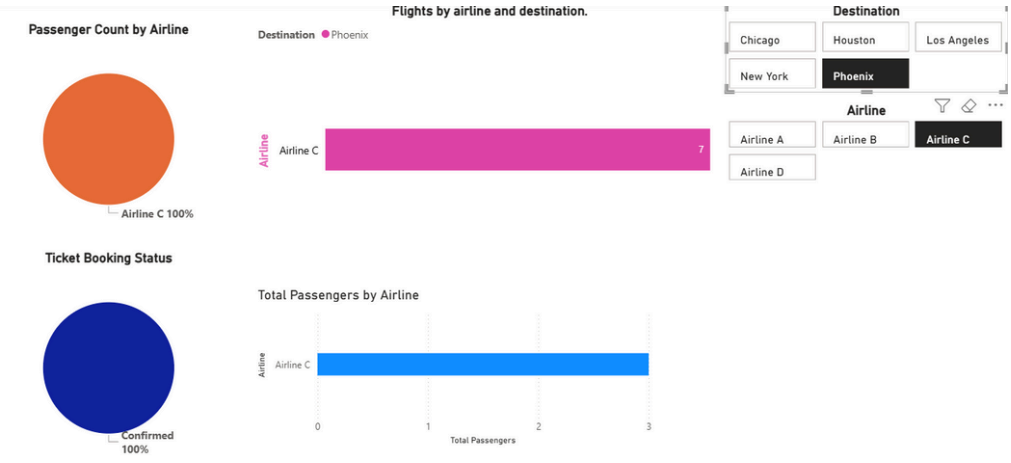


Airline C and Houston

Airline C and Los Angeles



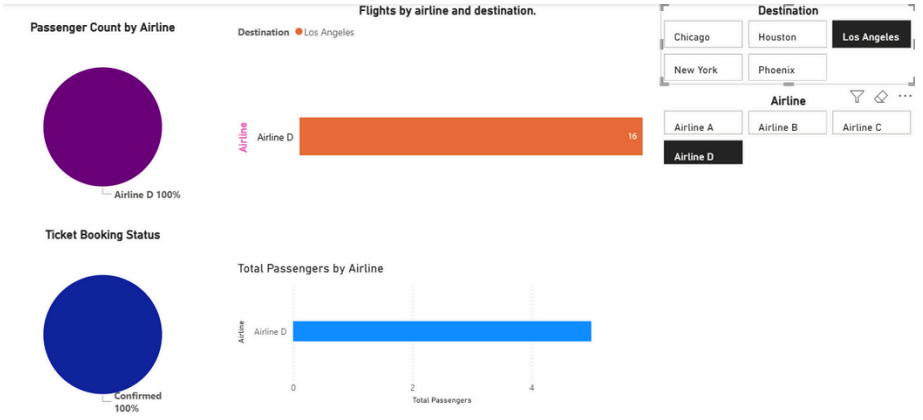
Airline C and New York



Airline C and Phoenix

Airline D and Chicago

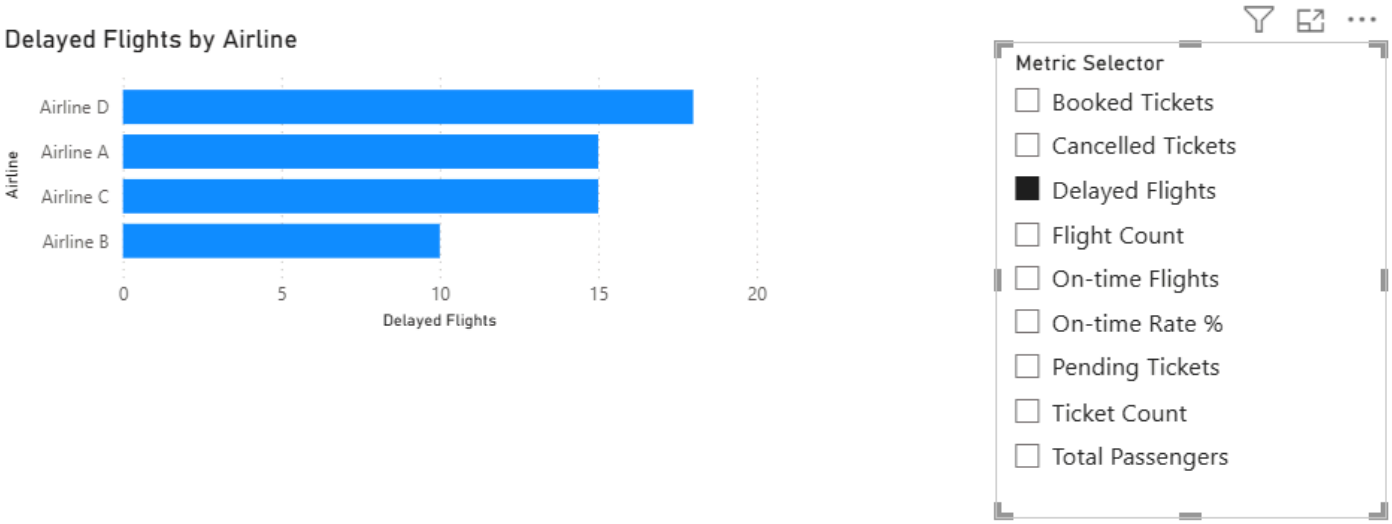
Airline D and Houston



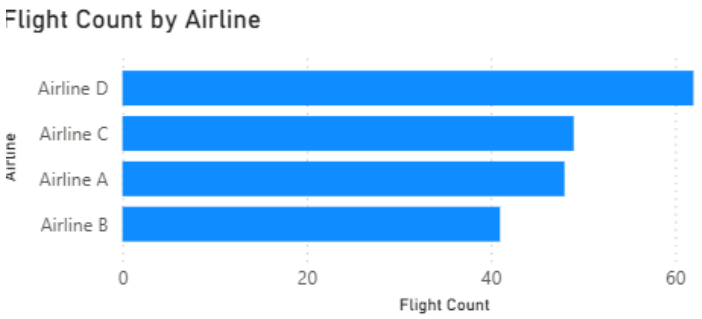
Airline D and Los Angeles

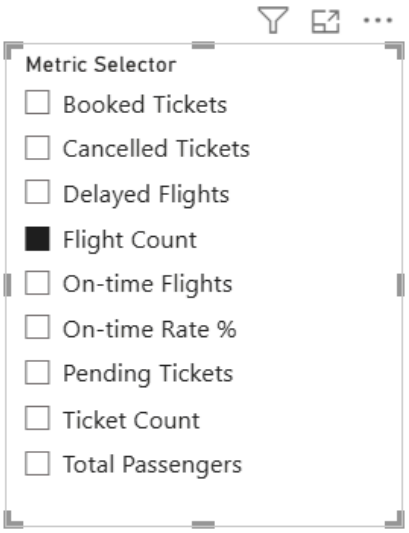
Airline D and New York

○ **Quick views:** combined multiple fields (like Passenger Count, Ticket Status, Flights by Destination) into a parameter table. Then added Parameter as slicers.

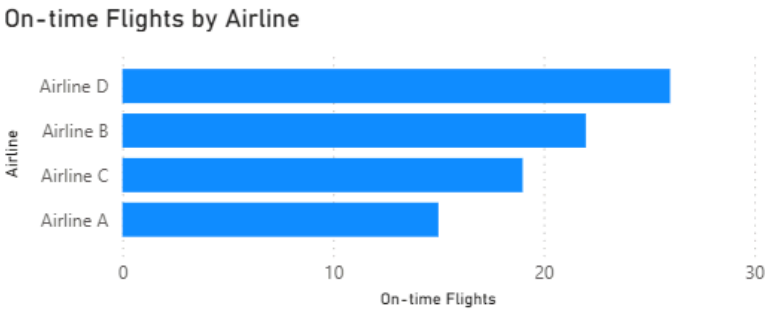


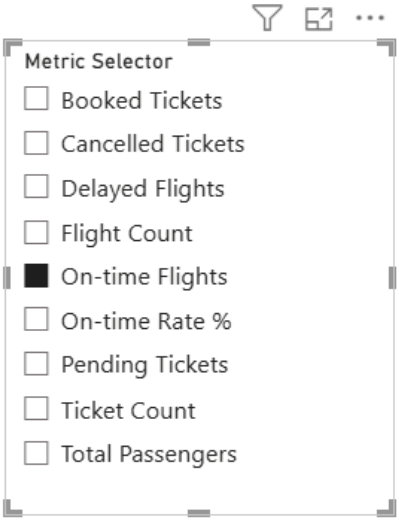
Delayed Flight by Airline



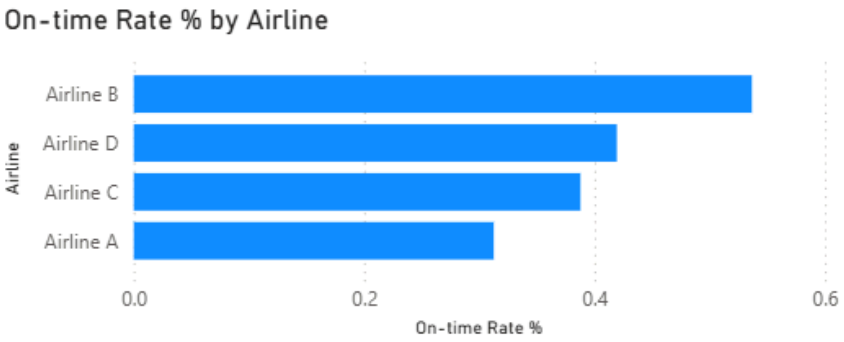


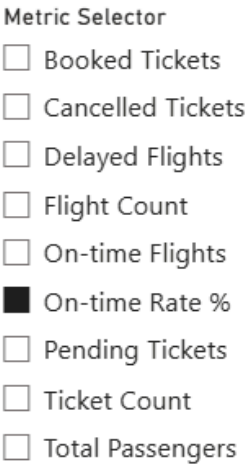
Flight Count per Airline



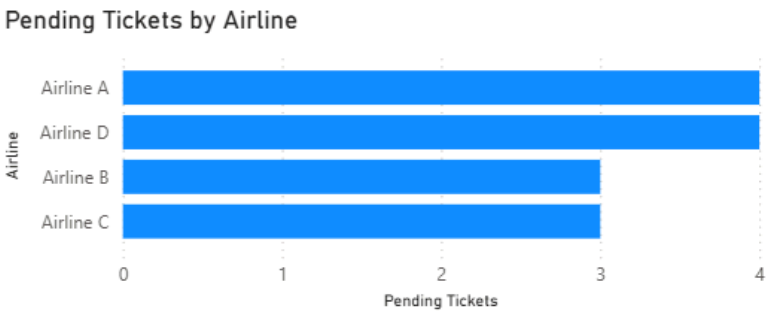


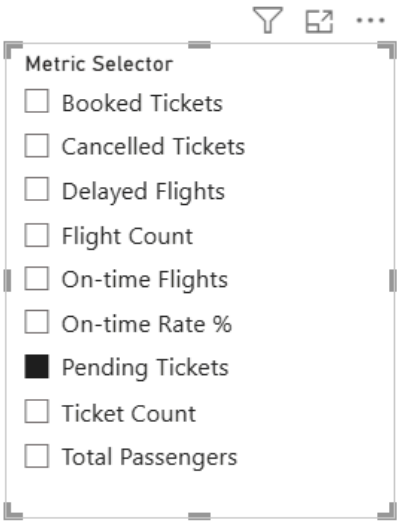
On-Time Flights



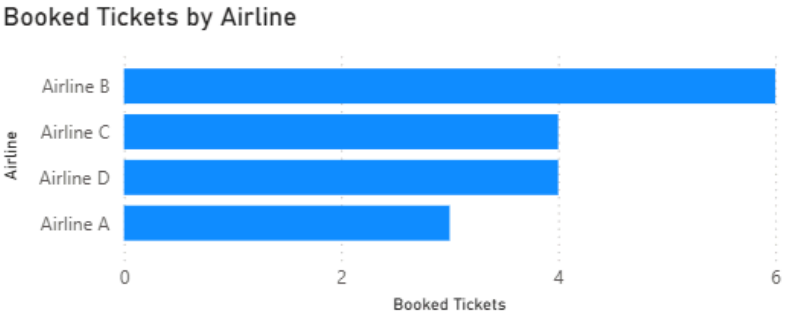


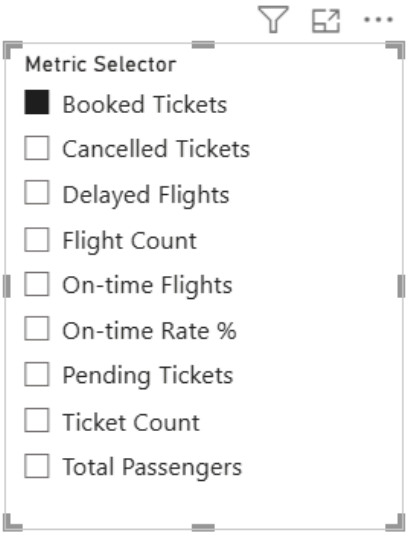
On-Time Rate %



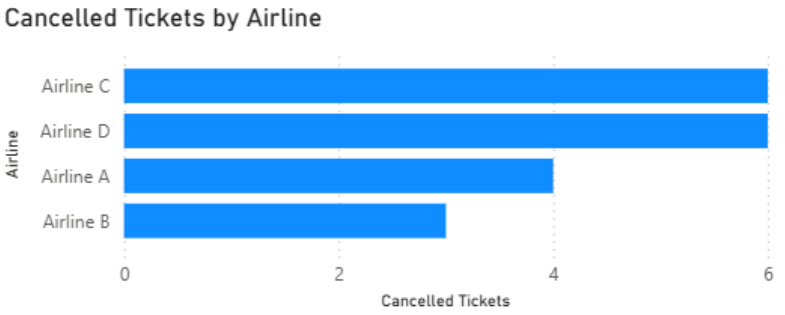


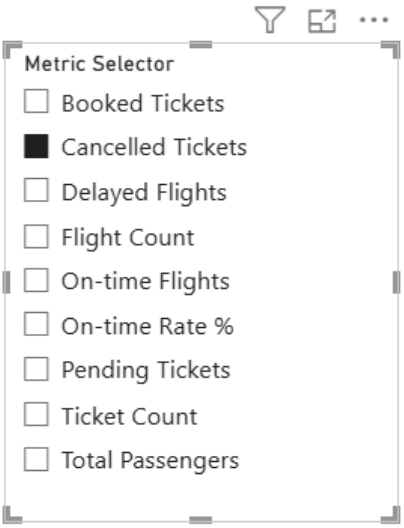
Pending ticket



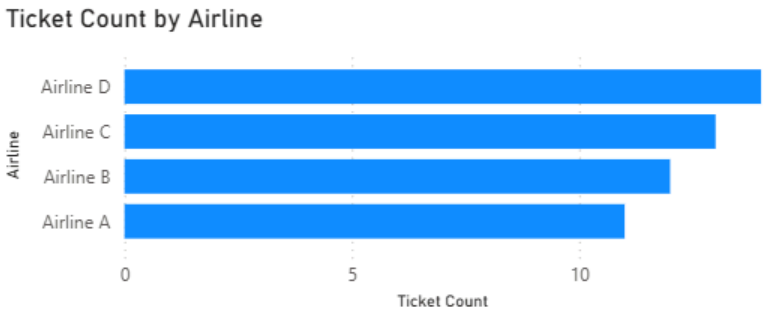


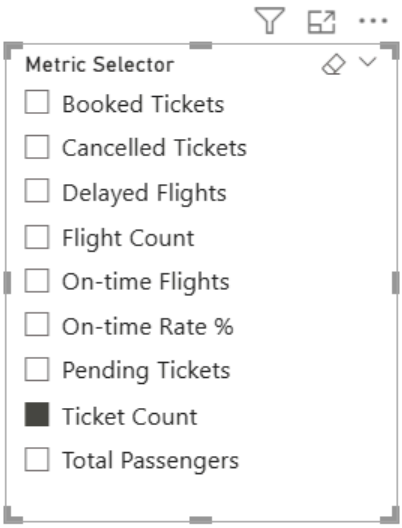
Booked TIcket



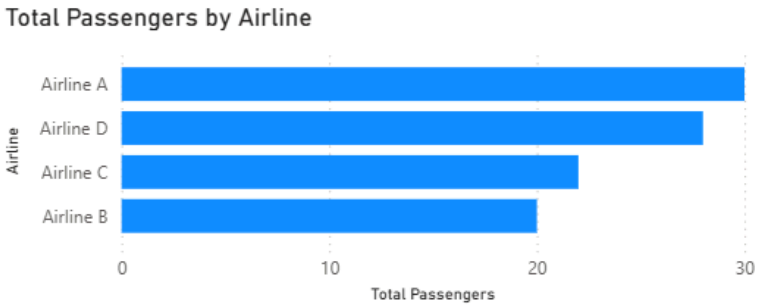


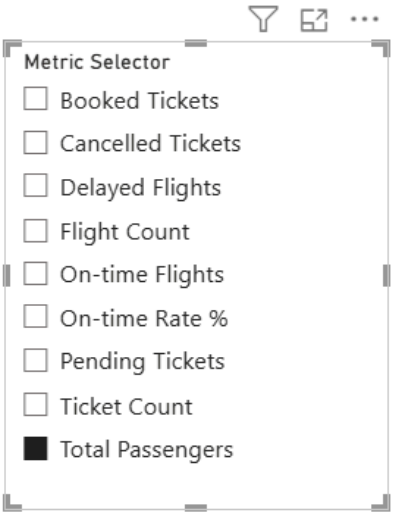
Cancelled Ticket





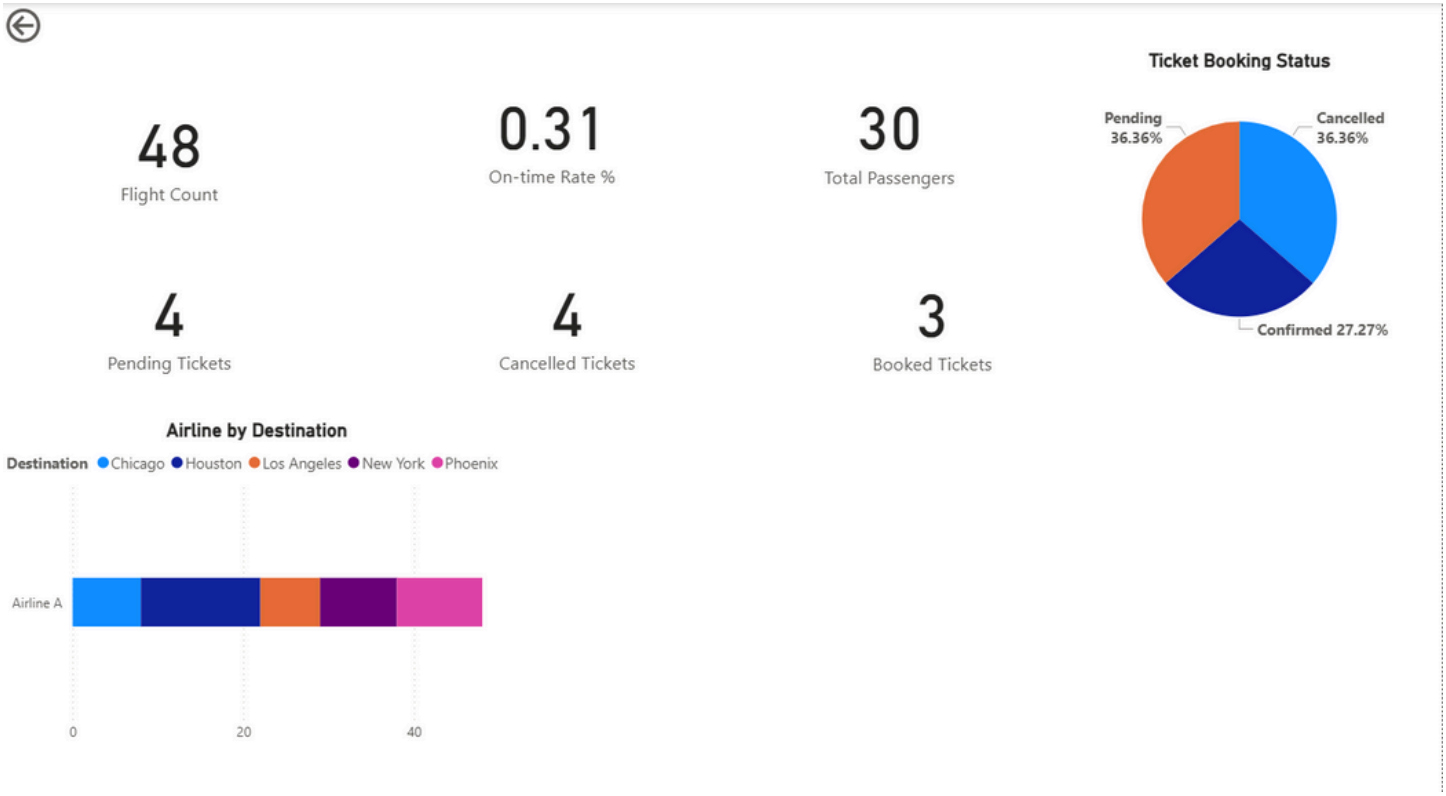
Ticket Count



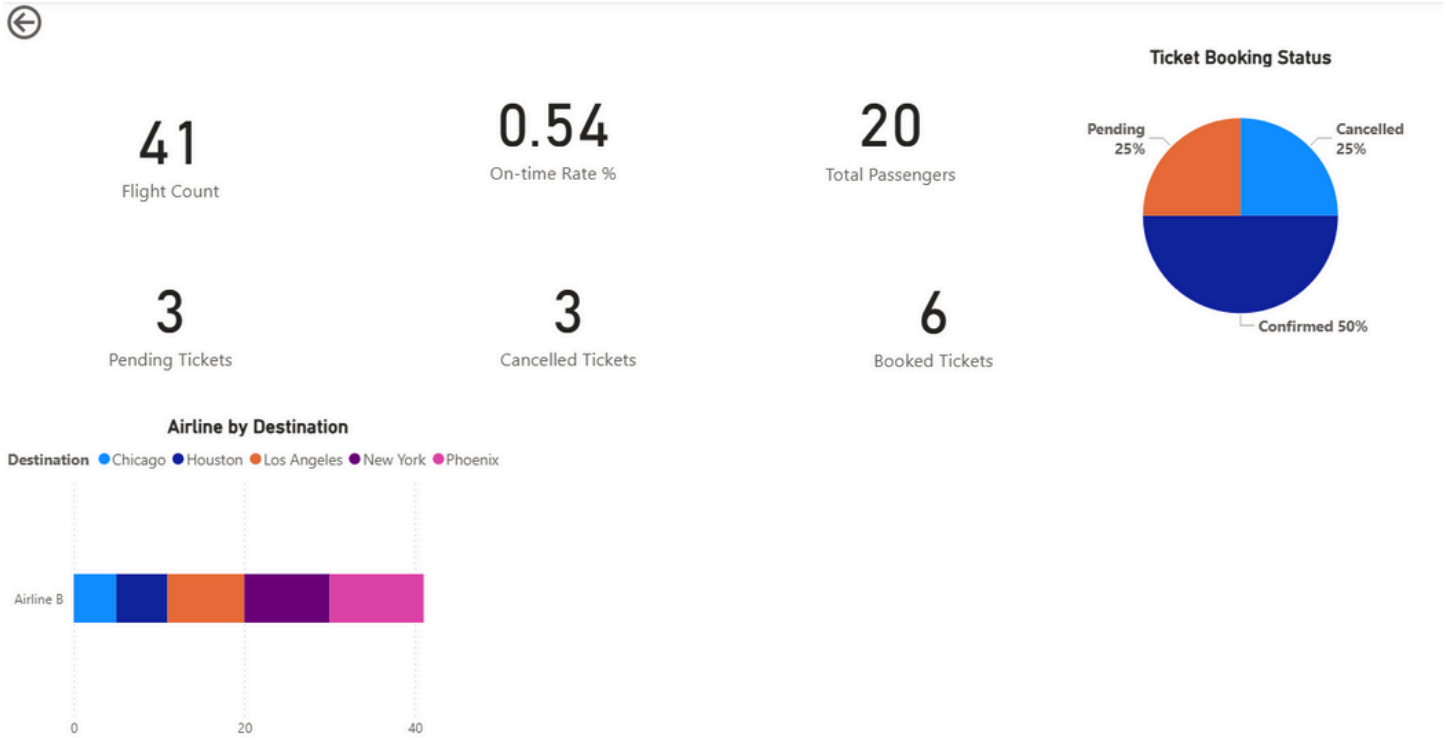


Total Passengers

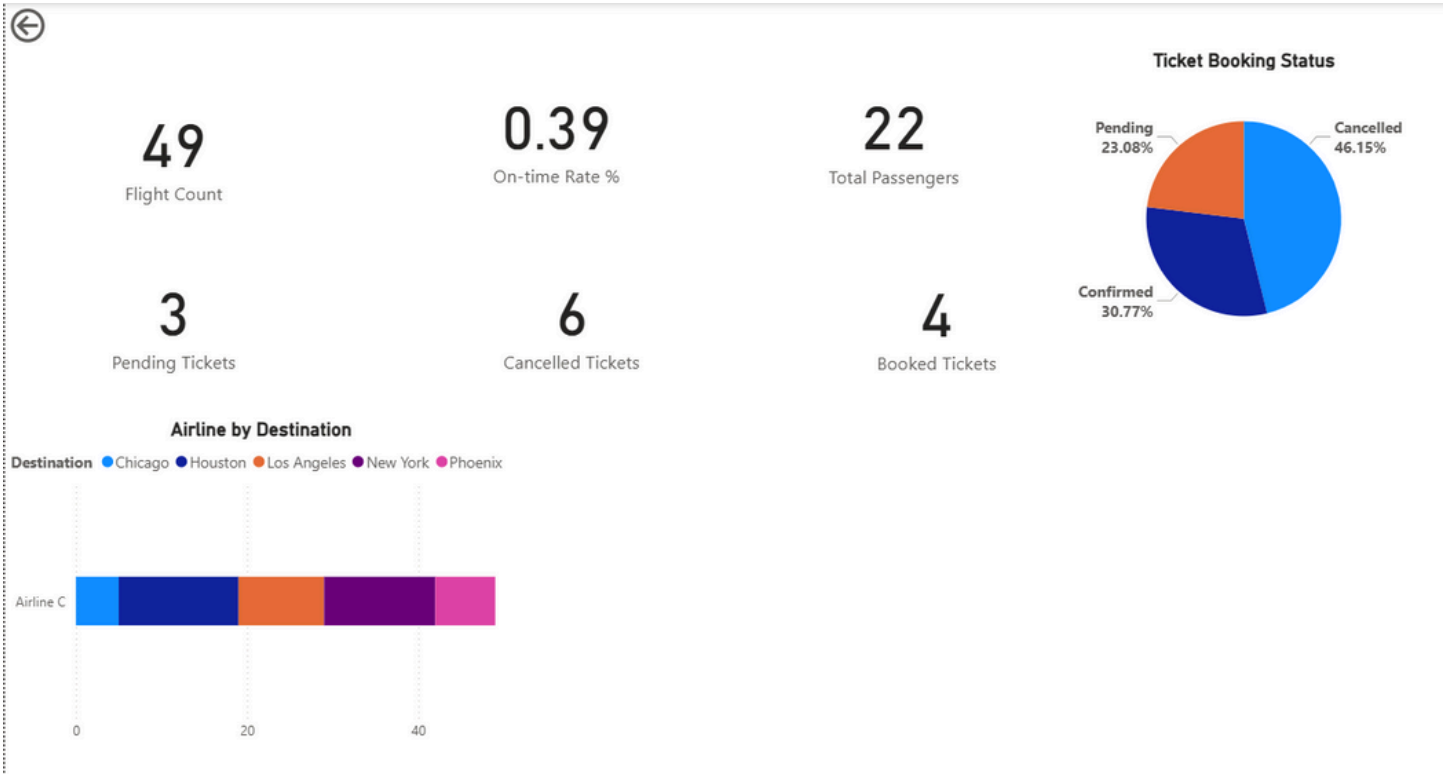
○ **Airline-specific pages:** Created a Airline Details Page and Performed a Drill-Through option to this Page from Main Page for Each Flight.



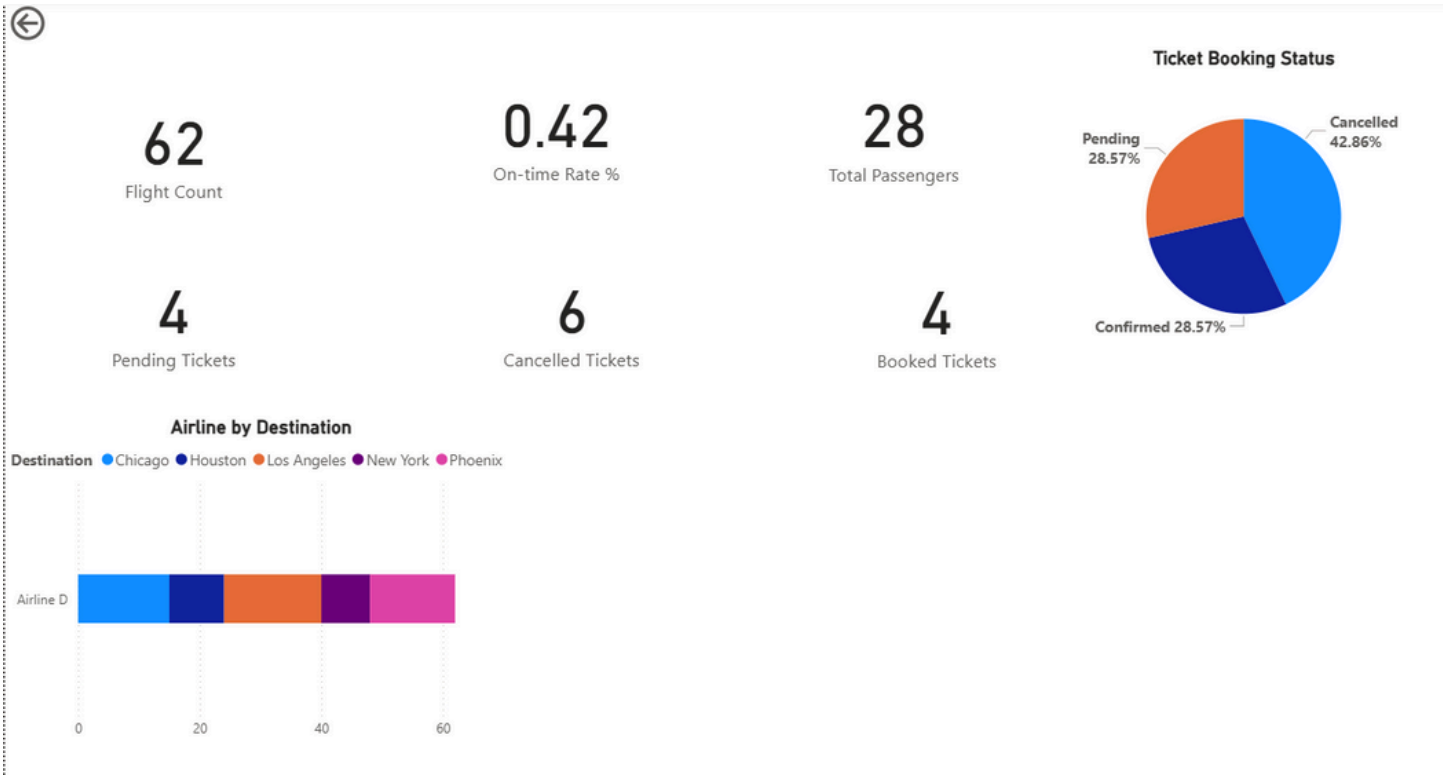
Airline A drill-through



Airline B drill-through

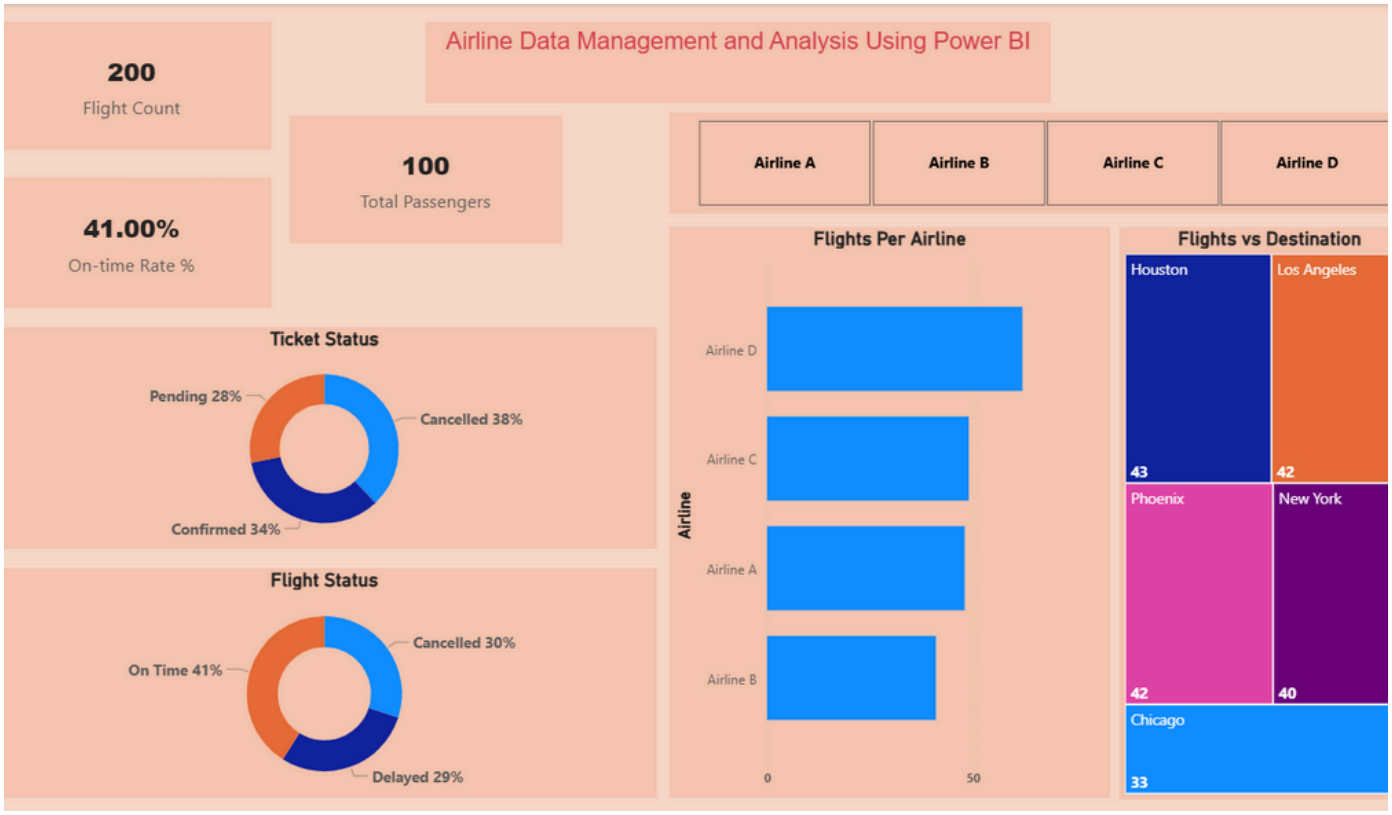


Airline C drill-through



Airline D drill-through

6. Final Dashboard and Power BI Service



Main Dashboard

Insights:

Airline Operations Insights

- **Total Flights: 200 flights were operated in the dataset.**
- **Passenger Volume: Only 100 passengers recorded, suggesting small-scale or filtered dataset.**

Ticket Status Insights

- **Cancelled Tickets: 38% (highest share) → cancellation rate is a concern.**
- **Confirmed Tickets: 34% → slightly lower than cancellations.**
- **Pending Tickets: 28% → nearly 1/3rd of bookings still undecided.**

Action Point: **High cancellation and pending rates may indicate customer dissatisfaction or booking issues.**

Flight Status Insights

- **On-Time Performance: Only 41% flights were on-time.**
- **Cancelled Flights: 30% → a major operational issue.**
- **Delayed Flights: 29% → nearly 1 in 3 flights are delayed.**

Action Point: **Reliability is a key concern—over 59% flights are either delayed or cancelled.**

Airline-Wise Performance

- **Airline D operated the highest number of flights.**
- **Airline B operated the lowest number of flights.**

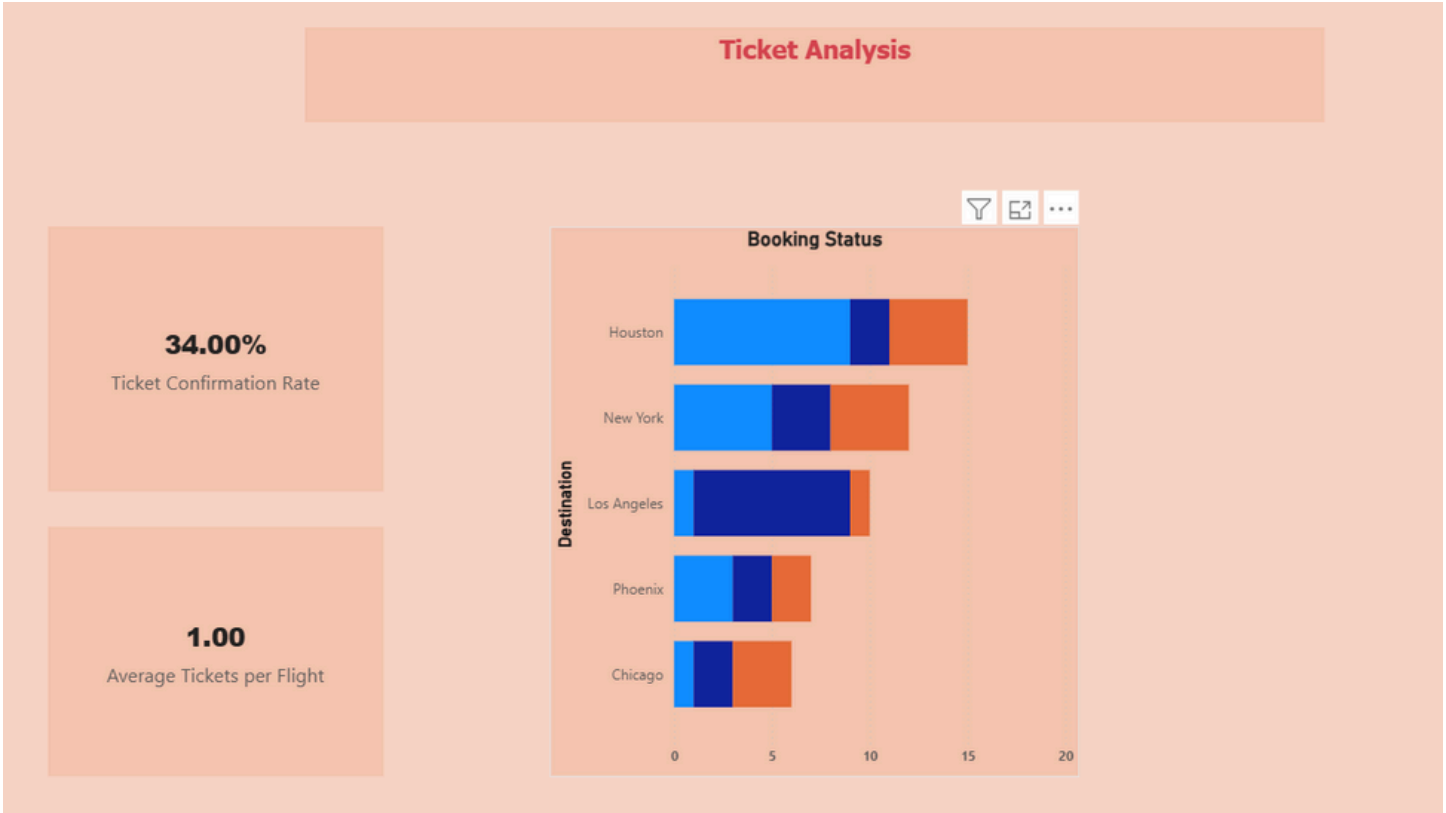
Action Point: **Airline D dominates the operations, while Airline B may need support to improve competitiveness.**

Destination Insights

- **Top Destinations: Houston (43), Los Angeles (42), Phoenix (42).**
- **Lowest Destination: Chicago (33).**
- **Observation: Demand is highest for Houston and West Coast (Los Angeles, Phoenix).**

Action Point: **Airlines can allocate more flights to high-demand cities and optimize under-served routes like Chicago.**

Note: The above dashboard is the overall summary dashboard.



Ticket Analysis

Insights:

Ticket Analysis Insights

- **Low Ticket Confirmation Rate: Only 34% of tickets are confirmed, meaning 66% are either cancelled or pending → strong sign of customer dissatisfaction or booking inefficiency.**

- **Very Low Passenger Load: On average, there is just 1 ticket per flight, indicating under-utilization of flights.**

Destination-Wise Booking Status

- **Houston has the highest total bookings, but a large portion is still unconfirmed/cancelled.**
- **New York also shows high booking activity, but cancellations are relatively higher.**
- **Los Angeles has fewer bookings compared to Houston/New York, but still shows a healthy split of statuses.**
- **Phoenix and Chicago have the lowest bookings, highlighting weaker demand on these routes.**

Destination Insights

Insights:

Flights per Destination

- **Houston (43), Los Angeles (42), and Phoenix (42) received the highest flight allocations.**
- **New York (40) is close behind.**
- **Chicago (33) has the lowest number of flights assigned.**

Observation: **Flight allocation is fairly balanced across major destinations, but Chicago is under-served compared to others.**

Cancelled Tickets by Destination

- **Houston has the highest ticket cancellations (~10), even though it has the most flights.**
- **New York follows with significant cancellations (~5).**
- **Phoenix, Chicago, and Los Angeles have relatively fewer cancellations.**

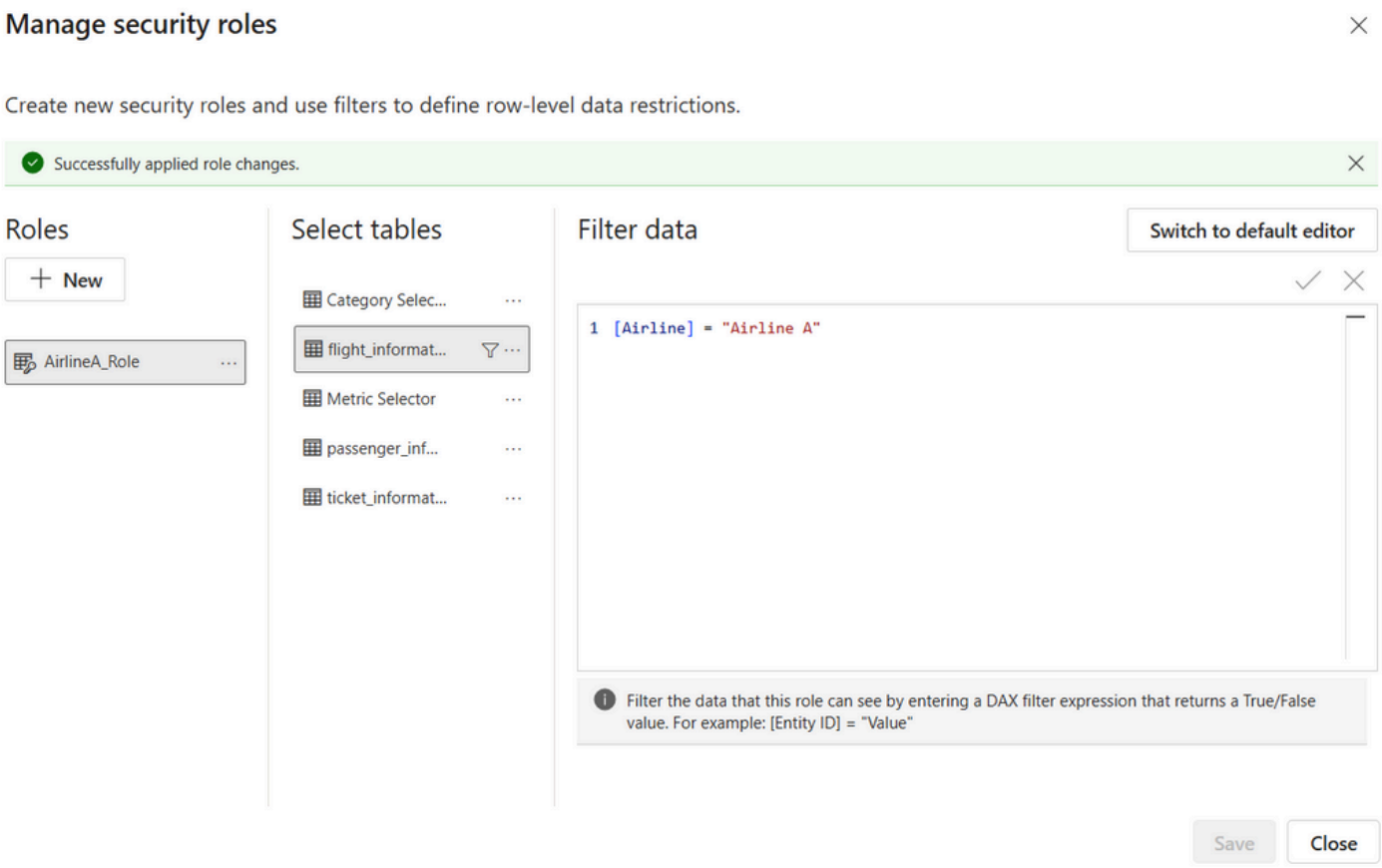
Observation: **Popular destinations (Houston, New York) face higher cancellation rates, possibly due to overbooking, operational issues, or demand volatility.**

Total Passengers by Destination

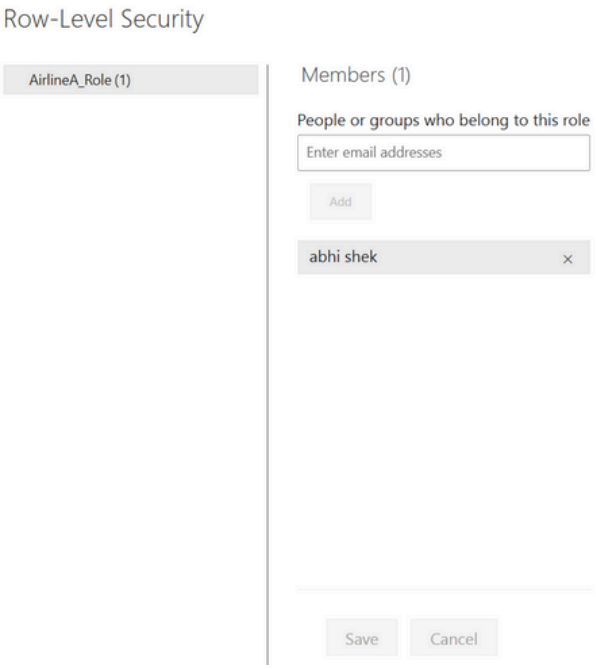
- **Phoenix leads with 30 passengers despite not having the highest number of flights.**
- **Chicago (20) and Houston (21) show moderate passenger volumes.**
- **New York (18) lags behind despite being a major hub.**
- **Los Angeles (11) has the lowest passenger count.**

Observation: **Phoenix is performing strongly in terms of passenger demand relative to its flight allocation, while Los Angeles and New York are underperforming.**

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



Created a Role named “AirlineA_Role” and given access only to Airline A Details



Given Access to abhishek user

I am not able to schedule Refresh Rate because i am using free version Power Bi.Therefore not able to schedule Refresh Rate in free version.