

Airline Data Management and Analysis Using Power BI

TASK-1

Queries [3] X ✓ f Table.SelectColumns(#"Changed Type",{"FlightID", "FlightNumber", "Airline", "Destination", "Status"})

	FlightID	FlightNumber	Airline	Destination	Status
1	2002	FL1102	Airline D	Houston	On Time
2	2002	FL1405	Airline B	Chicago	On Time
3	2003	FL1860	Airline A	New York	Cancelled
4	2004	FL1270	Airline C	Chicago	Delayed
5	2005	FL1100	Airline C	New York	Delayed
6	2006	FL1072	Airline A	Phoenix	On Time
7	2007	FL1700	Airline C	Los Angeles	Cancelled
8	2008	FL1020	Airline C	Los Angeles	Delayed
9	2009	FL1814	Airline A	Los Angeles	Cancelled
10	2010	FL1171	Airline D	Chicago	Cancelled
11	2013	FL1406	Airline A	Phoenix	On Time
12	2013	FL1214	Airline D	New York	Delayed
13	2013	FL1330	Airline C	Houston	On Time
14	2014	FL1458	Airline C	New York	Delayed
15	2015	FL1087	Airline C	Houston	Delayed
16	2016	FL1872	Airline B	New York	Delayed
17	2017	FL1099	Airline D	Phoenix	Delayed
18	2018	FL1871	Airline B	Houston	Delayed
19	2019	FL1863	Airline B	Chicago	Cancelled
20	2020	FL1130	Airline A	New York	On Time
21	2021	FL1661	Airline B	New York	Cancelled
22	2022	FL1308	Airline A	Houston	Delayed
23	2026	FL1769	Airline A	Chicago	On Time
24	2024	FL1343	Airline B	Chicago	Delayed
25	2025	FL1401	Airline D	Phoenix	On Time
26	2026	FL1415	Airline D	Chicago	Cancelled
27	2027	FL1805	Airline D	Chicago	On Time
28	2028	FL1385	Airline D	Chicago	On Time

Query Settings

PROPERTIES

Name

flight_information

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Removed Other Columns

Flight Information data

Passenger Information data

Queries [3] X ✓ f Table.SelectColumns(#"Changed Type",{"SeatNumber", "FlightID", "PassengerID"})

	SeatNumber	FlightID	PassengerID
1	38A	1181	1
2	24D	1157	2
3	30B	1141	3
4	17E	1046	4
5	29D	1035	5
6	10A	1134	6
7	10A	1082	7
8	20E	1115	8
9	34E	1197	9
10	2E	1047	10
11	43C	1153	11
12	48C	1194	12
13	47A	1010	13
14	23C	1056	14
15	16D	1030	15
16	40D	1109	16
17	25C	1005	17
18	32C	1119	18
19	27E	1033	19
20	32B	1118	20
21	19E	1065	21
22	5B	1146	22
23	28B	1177	23
24	22E	1011	24
25	6A	1085	25
26	5A	1026	26
27	12B	1063	27
28	46B	1086	28

Query Settings

PROPERTIES

Name

passenger_information

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Removed Other Columns

Queries [3] X ✓ f Table.SelectColumns(#"Changed Type",{"TicketID", "FlightID", "BookingStatus"})

	TicketID	FlightID	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	1084	Pending
12	5012	1150	Cancelled
13	5013	1060	Cancelled
14	5014	1064	Confirmed
15	5015	1093	Confirmed
16	5016	1072	Pending
17	5017	1011	Cancelled
18	5018	1105	Cancelled
19	5019	1014	Confirmed
20	5020	1080	Pending
21	5021	1030	Confirmed
22	5022	1035	Confirmed
23	5023	1163	Confirmed
24	5024	1005	Confirmed
25	5025	1083	Cancelled
26	5026	1123	Cancelled
27	5027	1078	Confirmed
28	5028	1154	Pending

Query Settings

PROPERTIES

Name

ticket_information

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

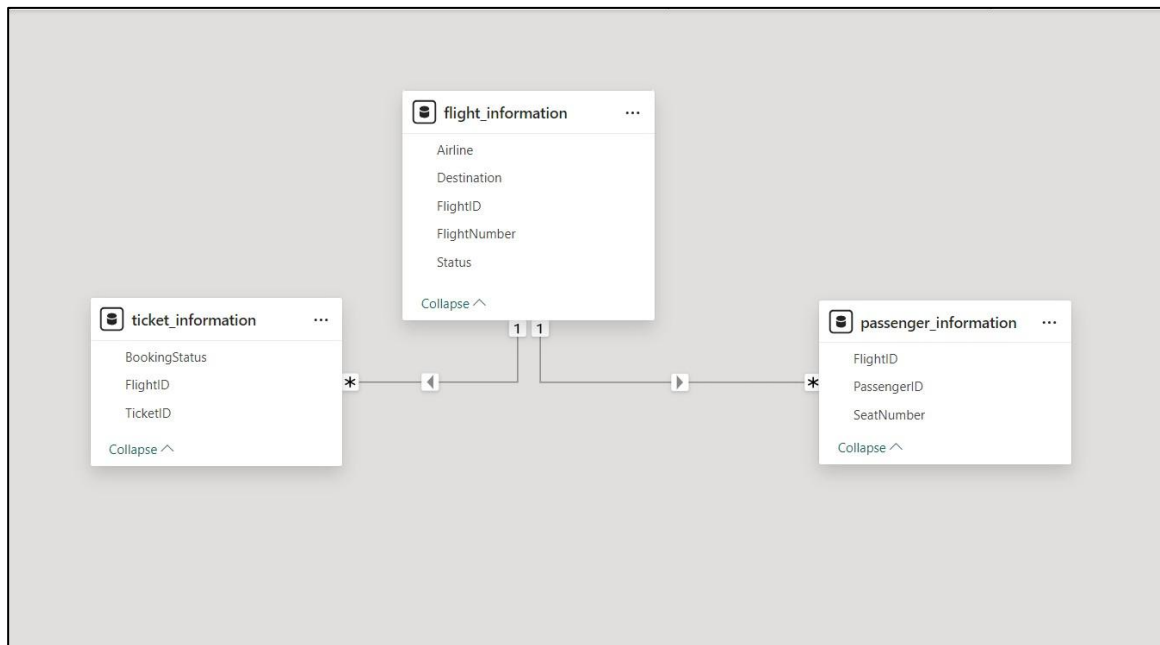
Removed Other Columns

Ticket Information data

Steps:

1. I imported all the Excel files individually into the power query's editor.
2. Then, I removed the unnecessary columns from these three tables.
3. Apart from the unnecessary columns, everything else is fine in these three files.

TASK - 2



Steps:

1. After closing and applying the power query editor, I went to the model view to join the table.
2. The fact table from these three tables is the flight information and the other two tables are the dimensions table. So, the other two tables will be joined with the fact table.
3. The relationship of the flight information table with the other two tables is one to many.

TASK-3

1.

The screenshot shows the Power Query Editor with a table containing flight data. The table has columns: FlightID, FlightNumber, Airline, Destination, Status, and Remarks. The data is filtered to show only flights with a status of 'On Time' or 'Cancelled'.

	FlightID	FlightNumber	Airline	Destination	Status	Remarks
1	1001	FL1102	Airline D	Houston	On Time	Best
2	1002	FL1435	Airline B	Chicago	On Time	Best
3	1003	FL1860	Airline A	New York	Cancelled	Worse
4	1004	FL1270	Airline C	Chicago	Delayed	To be improved
5	1005	FL1106	Airline C	New York	Delayed	To be improved
6	1006	FL1071	Airline A	Phoenix	On Time	Best
7	1007	FL1700	Airline C	Los Angeles	Cancelled	Worse
8	1008	FL1020	Airline C	Los Angeles	Delayed	To be improved
9	1009	FL1614	Airline A	Los Angeles	Cancelled	Worse
10	1010	FL1121	Airline D	Chicago	Cancelled	Worse
11	1011	FL1466	Airline A	Phoenix	On Time	Best
12	1012	FL1214	Airline D	New York	Delayed	To be improved
13	1013	FL1330	Airline C	Houston	On Time	Best
14	1014	FL1458	Airline C	New York	Delayed	To be improved
15	1015	FL1087	Airline C	Houston	Delayed	To be improved
16	1016	FL1372	Airline B	New York	Delayed	To be improved
17	1017	FL1099	Airline D	Phoenix	Delayed	To be improved
18	1018	FL1871	Airline B	Houston	Delayed	To be improved
19	1019	FL1663	Airline B	Chicago	Cancelled	Worse
20	1020	FL1130	Airline A	New York	On Time	Best
21	1021	FL1661	Airline B	New York	Cancelled	Worse
22	1022	FL1308	Airline A	Houston	Delayed	To be improved
23	1023	FL1769	Airline A	Chicago	On Time	Best
24	1024	FL1343	Airline B	Chicago	Delayed	To be improved
25	1025	FL1491	Airline D	Phoenix	On Time	Best
26	1026	FL1413	Airline D	Chicago	Cancelled	Worse

The Applied Steps pane on the right shows the following steps:

- Source
- Navigation
- Promoted Headers
- Changed Type
- Removed Other Columns
- Added Conditional Column
- Changed Type1
- Renamed Columns
- Inserted Text After Delimiter
- Changed Type2

Steps:

1. I returned to the power query's editor to create a conditional column.
2. From the add column tab, I clicked on the conditional column option.
3. In the first condition, I select if the flight status is "On time," then the output will be "Best", else if the flight status is "Delayed," then the output will be "To be improved", else the output will be "Worse".
4. After that, I named the column Remarks.

2.

The screenshot displays the Power Query Editor interface. The main area shows a table with the following columns: FlightNumber, Airline, Destination, Status, Remarks, and Number. The 'Number' column is highlighted, and its data type is set to 'Whole number'. The table contains 28 rows of flight data. On the right side, the 'Query Settings' pane is visible, showing the 'Properties' tab with the query name 'flight_information' and the 'Applied Steps' list, which includes 'Changed Type2'.

	FlightNumber	Airline	Destination	Status	Remarks	Number
1	FL1102	Airline D	Houston	On Time	Best	1102
2	FL1435	Airline B	Chicago	On Time	Best	1435
3	FL1860	Airline A	New York	Cancelled	Worse	1860
4	FL1270	Airline C	Chicago	Delayed	To be improved	1270
5	FL1106	Airline C	New York	Delayed	To be improved	1106
6	FL1071	Airline A	Phoenix	On Time	Best	1071
7	FL1700	Airline C	Los Angeles	Cancelled	Worse	1700
8	FL1020	Airline C	Los Angeles	Delayed	To be improved	1020
9	FL1614	Airline A	Los Angeles	Cancelled	Worse	1614
10	FL1121	Airline D	Chicago	Cancelled	Worse	1121
11	FL1466	Airline A	Phoenix	On Time	Best	1466
12	FL1214	Airline D	New York	Delayed	To be improved	1214
13	FL1330	Airline C	Houston	On Time	Best	1330
14	FL1458	Airline C	New York	Delayed	To be improved	1458
15	FL1087	Airline C	Houston	Delayed	To be improved	1087
16	FL1372	Airline B	New York	Delayed	To be improved	1372
17	FL1099	Airline D	Phoenix	Delayed	To be improved	1099
18	FL1871	Airline B	Houston	Delayed	To be improved	1871
19	FL1663	Airline B	Chicago	Cancelled	Worse	1663
20	FL1130	Airline A	New York	On Time	Best	1130
21	FL1661	Airline B	New York	Cancelled	Worse	1661
22	FL1308	Airline A	Houston	Delayed	To be improved	1308
23	FL1769	Airline A	Chicago	On Time	Best	1769
24	FL1343	Airline B	Chicago	Delayed	To be improved	1343
25	FL1491	Airline D	Phoenix	On Time	Best	1491
26	FL1413	Airline D	Chicago	Cancelled	Worse	1413
27	FL1805	Airline D	Chicago	On Time	Best	1805
28						

Steps:

1. To extract the flight number from FlightNumber, I selected the "column from examples"- "from selection" from the add column tab.
2. Then, I named the new column "Number," entered the number from the FlightNumber in the first row, and hit enter; after that, I changed the data type to the whole number.

TASK-4

1.

The screenshot shows the Power BI interface with two DAX formulas in the Calculations pane:

```
1 Total_passenger_specific_flight = CALCULATE(COUNT(passenger_information[PassengerID]), flight_information[FlightNumber]="FL1860")
```

```
1 Total_tickets_booked = COUNT(ticket_information[TicketID])
```

Below the formulas, a visual representation shows two cards:

- A blue card labeled "FLIGHT NUMBER - FL1860" with the value "2" and the text "Total_passenger_for_specific_flight".
- A green card with the value "50" and the text "Total_tickets_booked".

Steps:

1. I selected the enter data from the home tab to create a measure table.
2. In the measure table, I created two measures using DAX formulas.
3. The first formula is for the total passengers for a specific flight, i.e., FlightNumber = "FL1860".
DAX Formula: Total_passenger_specific_flight = CALCULATE (COUNT(passenger_information[PassengerID]), flight_information[FlightNumber]="FL1860")
4. The second formula is for the total number of tickets booked.
DAX Formula: Total_tickets_booked = COUNT(ticket_information[TicketID])

2.

The screenshot shows the Power BI interface with a table view of flight information. The table is filtered for "Best" flights. The table has the following columns: FlightID, FlightNumber, Airline, Destination, Status, and Remarks. The table contains 20 rows of data, all with "Best" in the Remarks column.

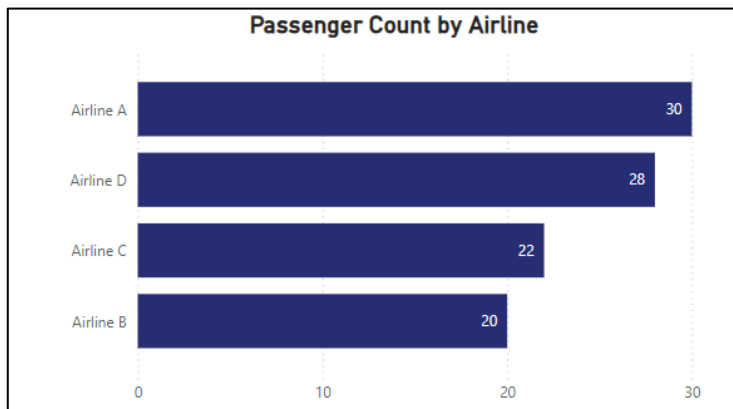
FlightID	FlightNumber	Airline	Destination	Status	Remarks
1001	FL1102	Airline D	Houston	On Time	Best
1002	FL1435	Airline B	Chicago	On Time	Best
1006	FL1071	Airline A	Phoenix	On Time	Best
1011	FL1466	Airline A	Phoenix	On Time	Best
1013	FL1330	Airline C	Houston	On Time	Best
1020	FL1130	Airline A	New York	On Time	Best
1023	FL1769	Airline A	Chicago	On Time	Best
1025	FL1491	Airline D	Phoenix	On Time	Best
1027	FL1805	Airline D	Chicago	On Time	Best
1028	FL1385	Airline D	Chicago	On Time	Best
1029	FL1191	Airline D	Los Angeles	On Time	Best
1030	FL1955	Airline B	Phoenix	On Time	Best
1031	FL1276	Airline B	New York	On Time	Best
1033	FL1459	Airline D	New York	On Time	Best
1034	FL1313	Airline B	Phoenix	On Time	Best
1036	FL1252	Airline D	Phoenix	On Time	Best
1039	FL1560	Airline B	Chicago	On Time	Best
1043	FL1681	Airline C	Houston	On Time	Best
1044	FL1475	Airline B	Phoenix	On Time	Best
1046	FL1975	Airline D	Chicago	On Time	Best
1048	FL1189	Airline A	New York	On Time	Best
1050	FL1686	Airline C	Phoenix	On Time	Best
1052	FL1562	Airline D	Phoenix	On Time	Best
1053	FL1875	Airline C	Chicago	On Time	Best
1055	FL1243	Airline B	New York	On Time	Best
1057	FL1504	Airline A	Phoenix	On Time	Best
1060	FL1818	Airline D	Chicago	On Time	Best

Steps:

1. To filter out the table showing "Best" flights only, I went to the table view and selected the flight information table.
2. I created a new table from the table tools column and wrote the dax formula to filter the best flights only.
DAX formula: Best_flights = FILTER(flight_information, flight_information[Remarks] = "Best")

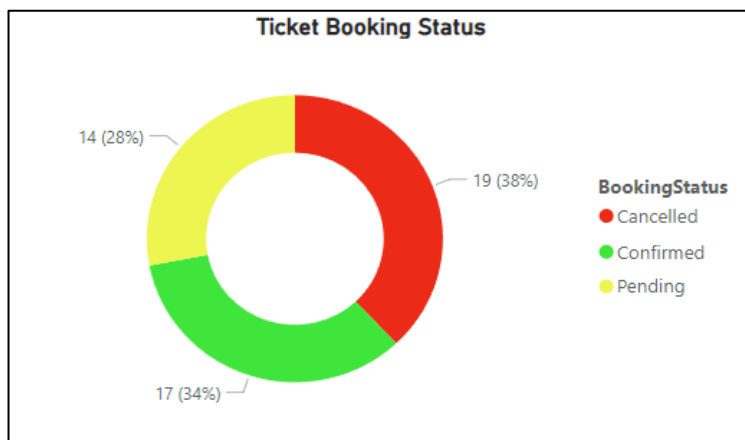
TASK – 5

1.



Steps:

To create a visual for passenger count by Airline, I selected the clustered bar chart and formatted the colors and texts in the format pane.



Steps:

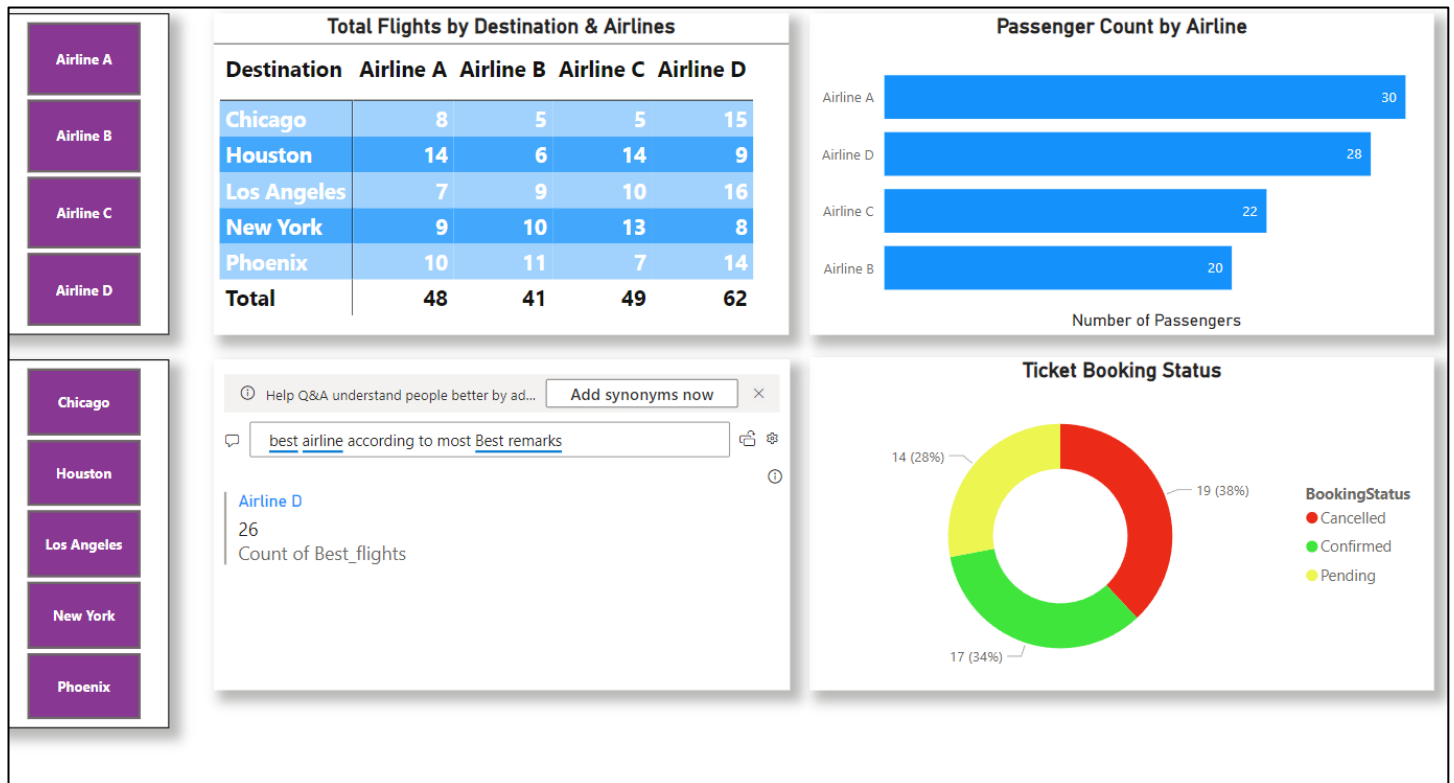
To create a visual for ticket booking statuses, I selected a donut chart and formatted the colors and texts in the format pane.

Total Flights by Destination & Airlines				
Destination	Airline A	Airline B	Airline C	Airline D
Chicago	8	5	5	15
Houston	14	6	14	9
Los Angeles	7	9	10	16
New York	9	10	13	8
Phoenix	10	11	7	14
Total	48	41	49	62

Steps:

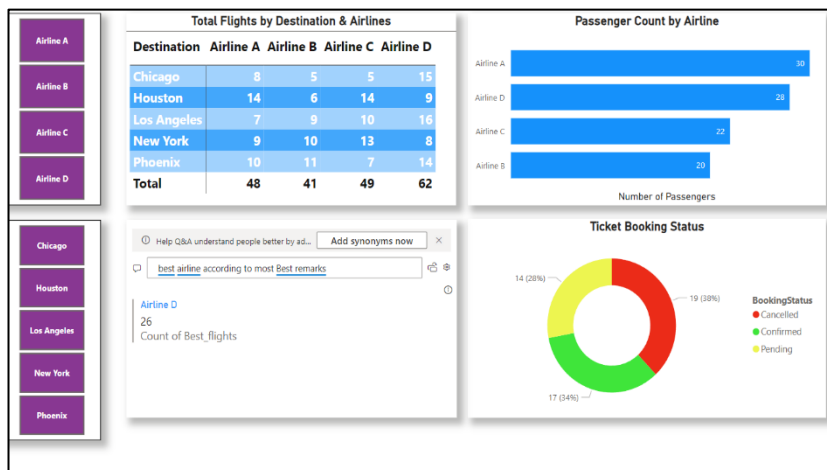
I selected a matrix to create a visual for total flights by destination and Airline and formatted the colors and text in the format pane.

2.



Steps:

I added the airline slicer, destination slicer, and Q&A visual to add interactive features for destination, airline, and quick views.



Steps:

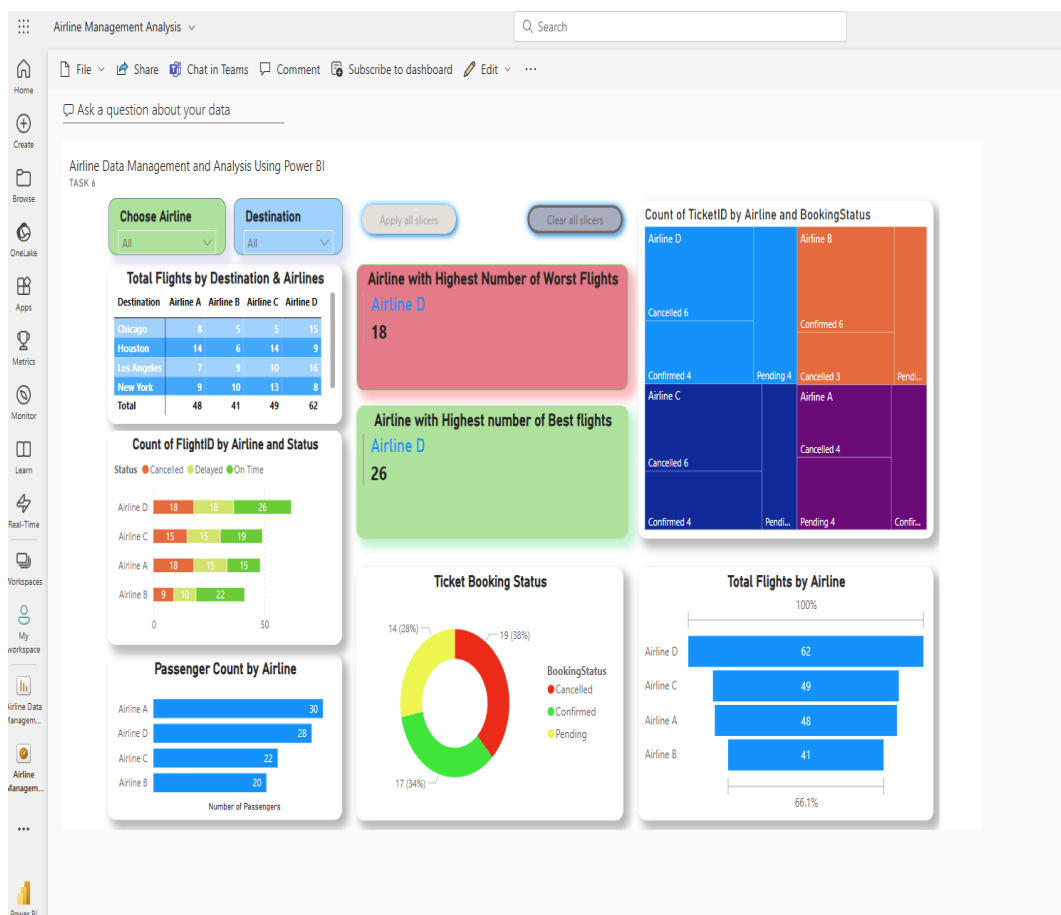
1. To add an interactive feature for an airline-specific page, I created a page for airline-specific visuals.



2. Then, I created a drill-through on the destination, airline slicer, and quick views page.
3. After that, I selected an airline from the matrix and drilled through to the airline-specific page.
4. So, if we want to look at detailed information about an airline, we just have to select a single airline from the matrix or bar graph and then click on drill through.

TASK-6

1.



Steps:

1. In this dashboard, I put together the visualization that was created in the previous task.
2. I added some extra visuals and interactive features for key insights: airline remarks, count of booking statuses by Airline and booking statuses, total flights by Airline, apply all

slicer button and clear all slicer button.

3. I used a 100% stacked bar chart for airline flight status(e.g: delay, on time or cancelled).
4. Next, for total flights by Airline, I used the funnel to determine the total number of flights operated by each Airline; in the values section, I used the count distinct function to get the total number of unique flights.
5. Then, for the count of booking status by airline and booking status, I used the treemap to determine the ticket status for each Airline.

- I created two new measures for the Airline with the highest number of best flights and then represented it in the multi-row card.

The DAX formulas are:

- Best_airline = `CALCULATE(MAX(Best_flights[Airline]),Best_flights[Remarks] = "Best")`
- Count_of_flights_best_airline = `CALCULATE(DISTINCTCOUNT(Best_flights[FlightNumber]), Best_flights[Airline]="Airline D")`

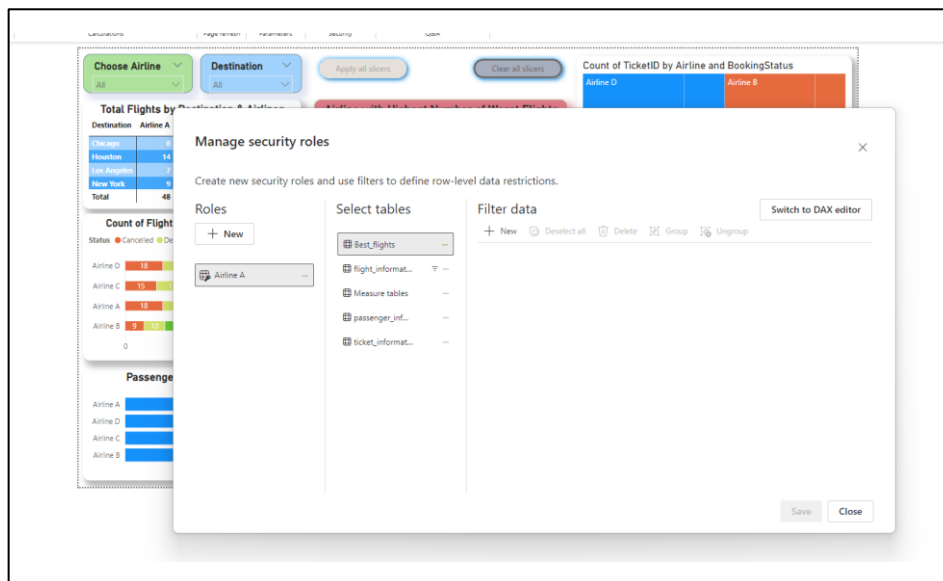
- For the airline with highest number of worse flights, I also created two new measures and then represented it in a multi-row card.

The DAX formulas are:

- worse_flights = `CALCULATE(MAX(flight_information[Airline]), flight_information[Remarks]="Worse")`
- count_of_worse_flights = `CALCULATE(DISTINCTCOUNT(flight_information[FlightNumber]), FILTER(flight_information, flight_information[Airline] = "Airline D" && flight_information[Remarks] = "Worse"))`

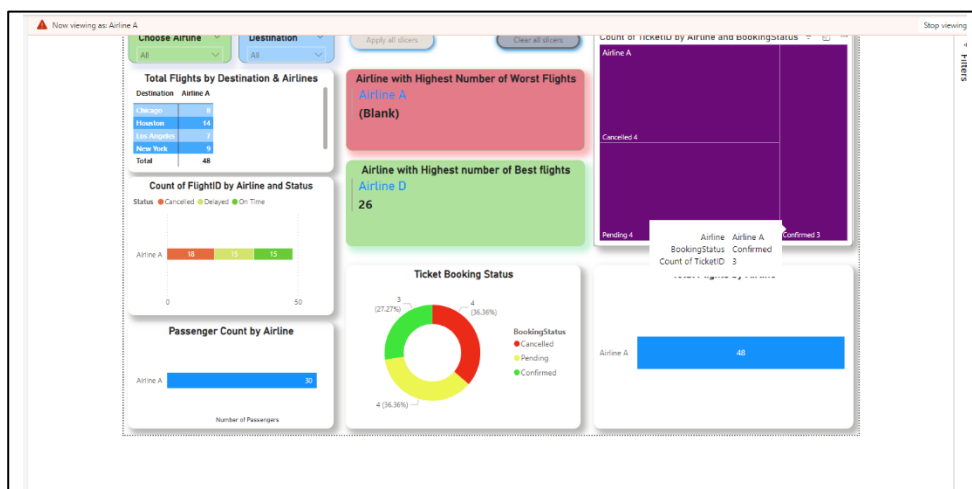
- After that, I published the power report in my workspace and then created a dashboard in the Power BI service called Airline Management Analysis, where I pinned the main report to the dashboard.

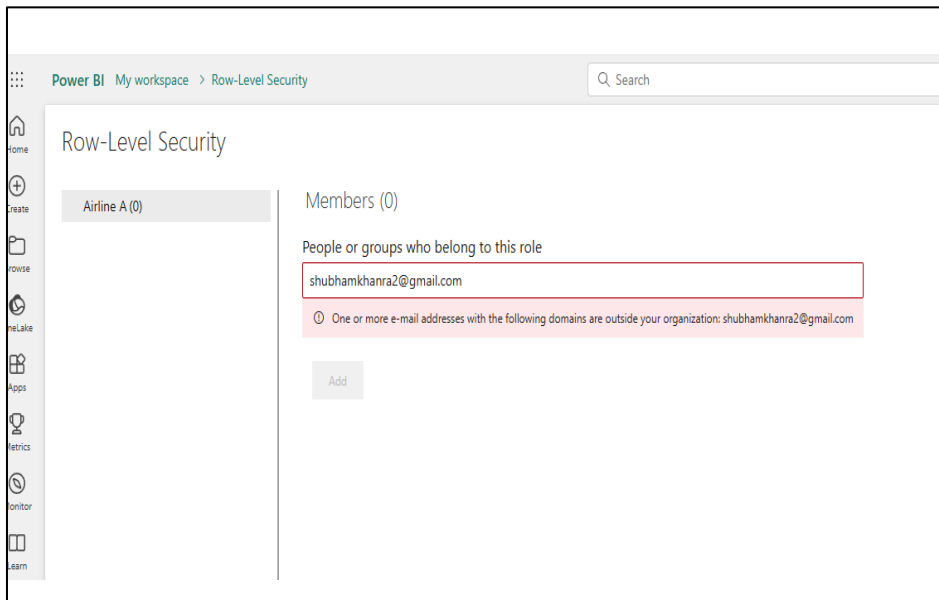
2.



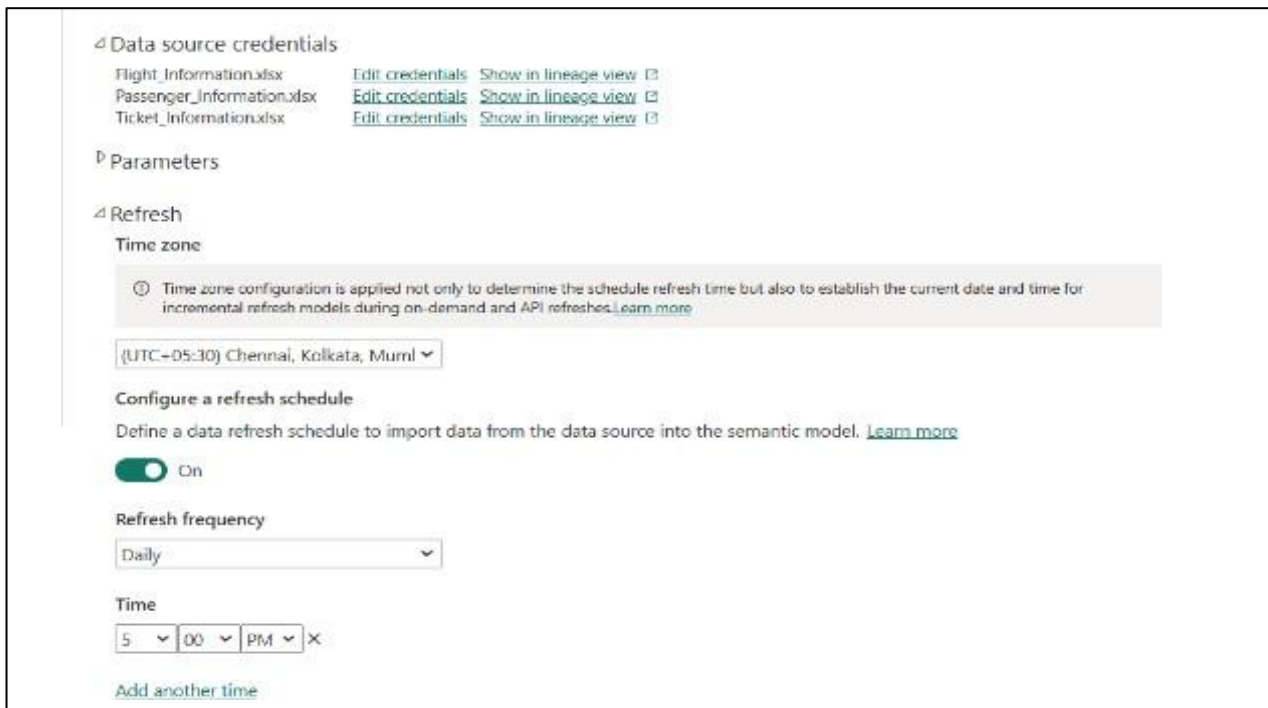
Steps:

- I selected the manage roles from the modeling tab to configure Row-Level Security (RLS) for Airline A data.
- Then, I created a new role called Airline A and selected the flight information table; after that, I created a new filter data where the Airline column equals Airline A value.
- To view the RLS, we have to select the "view as" option from the modeling tab and then choose the Airline A role.
- To assign it to a user, I clicked on the 3 dots of the Power BI project semantic in my workspace of Power BI service and chose security.
- After that, add the user's email ID and click save.





3.



Steps:

1. To set up a scheduled refresh at 5 PM daily, we have to select the Power BI settings from the settings present in my workspace.
2. After that, in the semantic models, we have to choose the refresh, select the time zone, and set the refresh frequency to daily.
3. Finally, set the time to 5 PM.