

Project : Airline Data Management and Analysis Using Power BI

1. Data Preparation and Cleaning (10 Marks)

- **Extract and transform data in Power Query:**
 - Open Power BI Desktop.
 - Click "Get Data" and import your Flight_Information, Passenger_Information, and Ticket_Information datasets.
 - Once loaded, click "Transform Data" to open the Power Query Editor.
- **Clean data:**
 - **Remove duplicates:** Select each table, right-click on the FlightID column, and choose "Remove Duplicates."
 - **Handle missing values:** Inspect each column. If there are missing values, right-click on the column header and choose options like "Replace Values," or "Fill Down/Up" based on the data context.
 - **Format columns:** Ensure data types are correct (e.g., FlightID as text or number, Booking Status as text). Adjust if necessary by clicking on the data type icon next to the column name.
- **Deliverables:** Screenshot of Power Query Editor showing cleaned data.

Project power bi

File Home Transform Add Column View Tools Help

Close & Apply New Source Recent Enter Data Data source settings Manage Parameters Refresh Preview Properties Advanced Editor Choose Remove Columns Keep Remove Rows Split Column Group By Data Type: Text Merge Queries Append Queries Combine Files Text Analytics Vision Azure Machine Learning

Queries [3] flight_information passenger_information ticket_information

Table.Distinct(#"Changed Type", {"FlightID"})

	TicketID	FlightID	BookingStatus	Column4	Column5	Column6	Column7
1	5001	1178	Pending	null	null	null	null
2	5002	1078	Confirmed	null	null	null	null
3	5003	1117	Cancelled	null	null	null	null
4	5004	1120	Cancelled	null	null	null	null
5	5005	1137	Cancelled	null	null	null	null
6	5006	1162	Pending	null	null	null	null
7	5007	1076	Pending	null	null	null	null
8	5008	1035	Cancelled	null	null	null	null
9	5009	1001	Cancelled	null	null	null	null
10	5010	1040	Cancelled	null	null	null	null
11	5011	1064	Pending	null	null	null	null
12	5012	1150	Cancelled	null	null	null	null
13	5013	1060	Cancelled	null	null	null	null
14	5015	1093	Confirmed	null	null	null	null
15	5016	1072	Pending	null	null	null	null
16	5017	1011	Cancelled	null	null	null	null
17	5018	1105	Cancelled	null	null	null	null
18	5019	1014	Confirmed	null	null	null	null
19	5021	1030	Confirmed	null	null	null	null
20	5023	1165	Confirmed	null	null	null	null
21	5024	1005	Confirmed	null	null	null	null
22	5025	1083	Cancelled	null	null	null	null
23	5026	1123	Cancelled	null	null	null	null
24	5028	1154	Pending	null	null	null	null
25	5029	1062	Pending	null	null	null	null
26	5030	1132	Pending	null	null	null	null
27	5031	1089	Pending	null	null	null	null
28							

26 COLUMNS, 42 ROWS Column profiling based on top 1000 rows

Query Settings

PROPERTIES

Name

ticket_information

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Removed Duplicates

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20°C Mostly cloudy

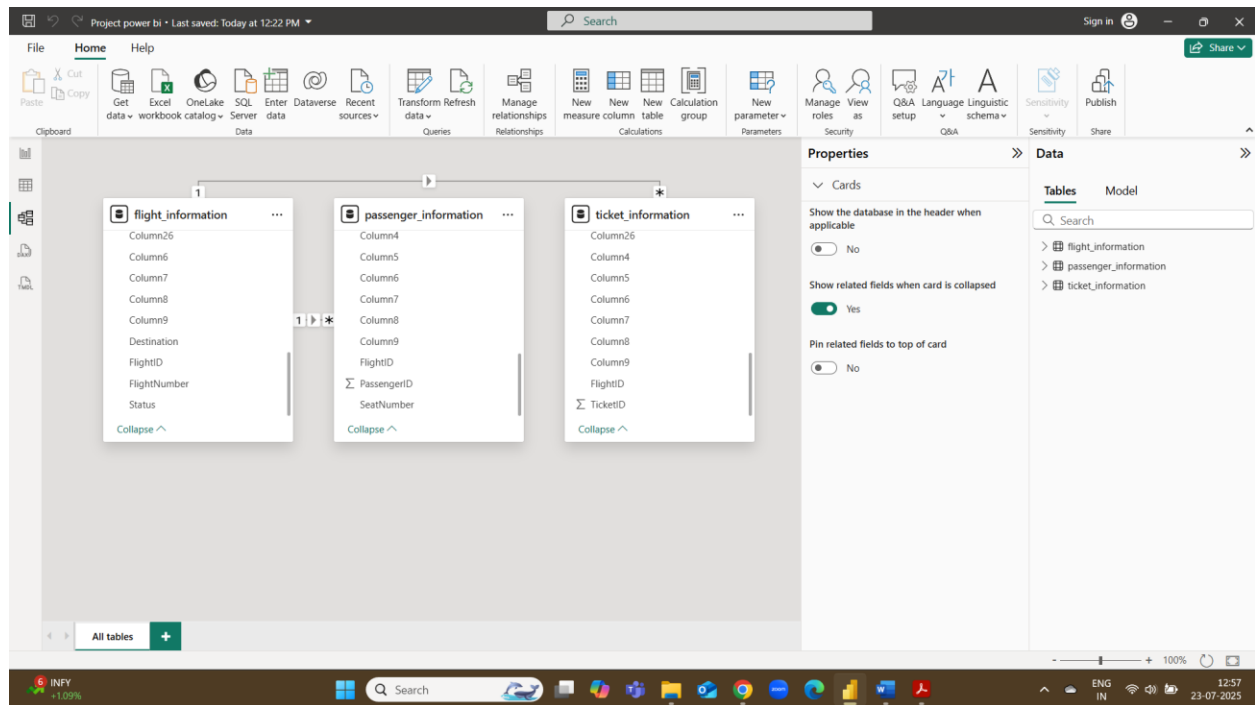
Search

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2. Data Modeling (10 Marks)

Create relationships between datasets (FlightID as the key):

- After applying and closing the Power Query Editor, gone to the "Model" view in Power BI Desktop.
- Drag and drop the FlightID column from Flight_Information to FlightID in Passenger_Information to create a relationship.
- Similarly, drag FlightID from Flight_Information to FlightID in Ticket_Information.
- Power BI automatically detect the cardinality (e.g., One-to-Many). Verified that Flight_Information is on the "one" side and Passenger_Information and Ticket_Information are on the "many" side for the FlightID relationships.



3. Enhanced Data Insights (10 Marks)

Add a conditional column to classify flights as "Best" or "To Be Improved" based on status:

- In Power Query Editor, selected the Flight_Information table.
- Gone to "Add Column" tab, then click "Conditional Columnn."
- Set up the condition:
 - Column Name: Flight Performance.
 - If Status equals "Completed", then "Best".
 - Else "To Be Improved".

Use "Column from Examples" to extract the flight number from FlightNumber:

- In Power Query Editor, select the Flight_Information table.
- Select the FlightNumber column.
- Go to "Add Column" tab, then click "Column from Examples" -> "From Selection."

- Typed the desired flight number extraction in the new column for a few rows. Power BI automatically infer the pattern. Renamed this new column “Extracted Flight Number”.

Query [3] = Table.AddColumn(#"Removed Duplicates", "Flight Performance", each if [Status] = "Completed" then "Best" else "To be Improved")

Column22	Column23	Column24	Column25	Column26	Flight Performance
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
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null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved
null	null	null	null	null	To be Improved

27 COLUMNS, 200 ROWS Column profiling based on top 1000 rows

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Enter sample values to create a new column (Ctrl+Enter to apply).
Transform: Text.AfterDelimiter([FlightNumber], " ")

FlightID	FlightNumber	Airline	Destination	Status	Extracted Flight Number
2002	FL1102	Airline D	Houston	On Time	1102
2002	FL1435	Airline B	Chicago	On Time	1435
2003	FL1860	Airline A	New York	Cancelled	1860
2004	FL1270	Airline C	Chicago	Delayed	1270
2005	FL1106	Airline C	New York	Delayed	1106
2006	FL1071	Airline A	Phoenix	On Time	1071
2007	FL1700	Airline C	Los Angeles	Cancelled	1700
2008	FL1020	Airline C	Los Angeles	Delayed	1020
2009	FL1614	Airline A	Los Angeles	Cancelled	1614
2010	FL1121	Airline D	Chicago	Cancelled	1121
2011	FL1466	Airline A	Phoenix	On Time	1466
2012	FL1214	Airline D	New York	Delayed	1214
2013	FL1330	Airline C	Houston	On Time	1330
2014	FL1458	Airline C	New York	Delayed	1458
2015	FL1087	Airline C	Houston	Delayed	1087
2016	FL1372	Airline B	New York	Delayed	1372
2017	FL1099	Airline D	Phoenix	Delayed	1099
2018	FL1871	Airline B	Houston	Delayed	1871
2019	FL1663	Airline B	Chicago	Cancelled	1663
2020	FL1130	Airline A	New York	On Time	1130
2021	FL1661	Airline B	New York	Cancelled	1661
2022	FL1308	Airline A	Houston	Delayed	1308
2023	FL1769	Airline A	Chicago	On Time	1769
2024	FL1343	Airline B	Chicago	Delayed	1343

26 COLUMNS, 200 ROWS Column profiling based on top 1000 rows

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4. Calculations Using DAX (10 Marks)

Total passengers for a specific flight:

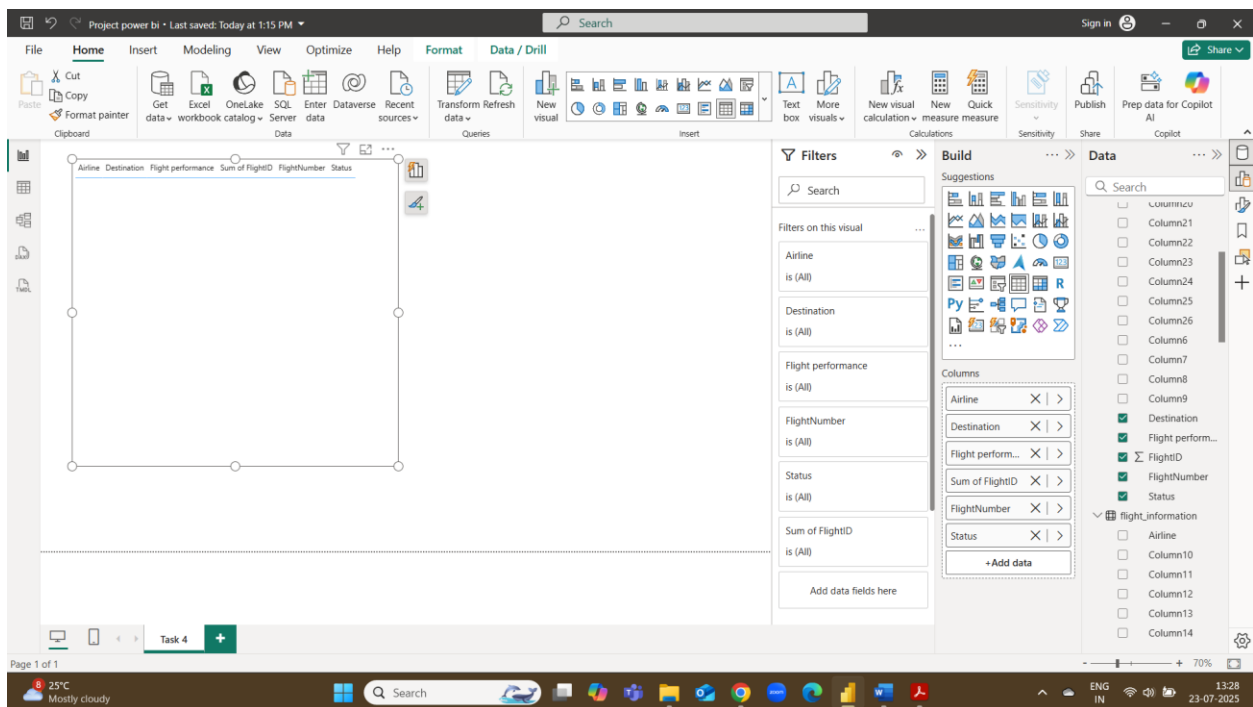
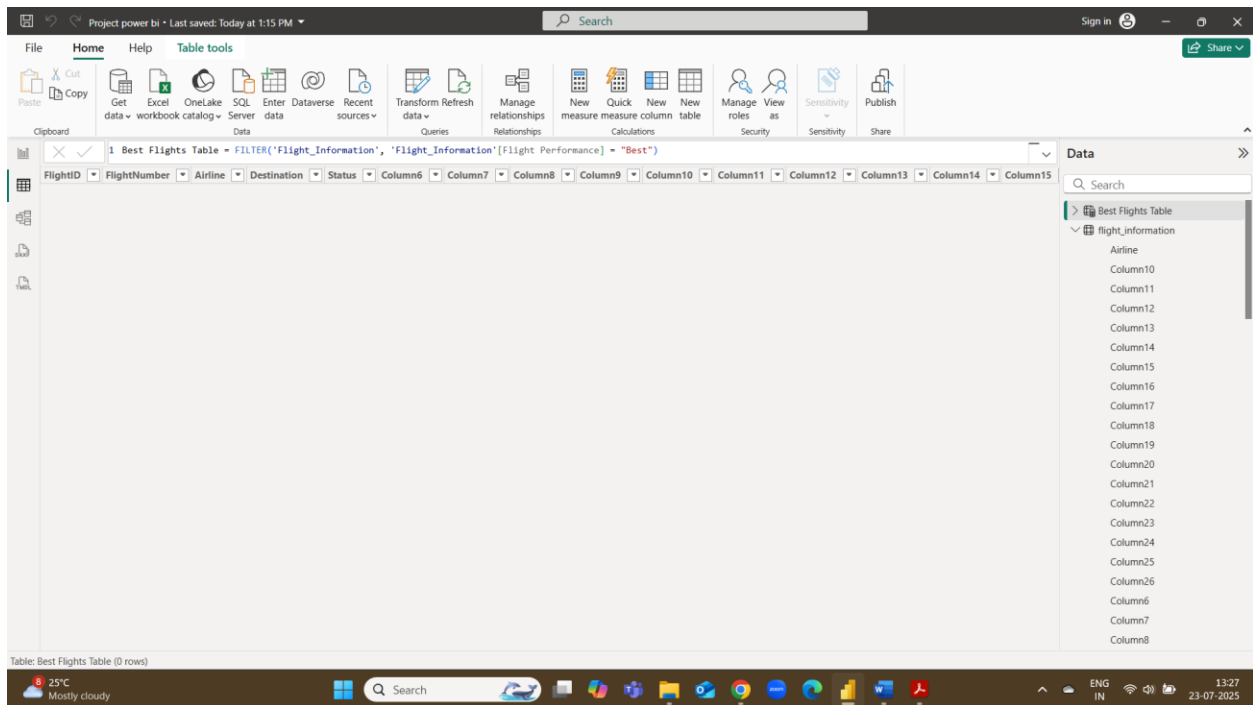
- In Power BI Desktop, gone to "Report" view.
- Selected the Passenger_Information table in the "Fields" pane.
- Click "New Measure."
- Enter the DAX formula: Total Passengers = COUNTROWS('Passenger_Information')

Total tickets booked:

- Selected the Ticket_Information table.
- Click "New Measure."
- Enter the DAX formula: Total Tickets Booked = COUNTROWS('Ticket_Information')

Filtered table showing "Best" flights only:

- To create a new table: Go to "Table tools" -> "New table."
- DAX formula: Best Flights Table = FILTER('Flight_Information', 'Flight_Information'[Flight Performance] = "Best")
- Screenshot of DAX calculations (from the measure pane or formula bar) and their results in a card visual or table.



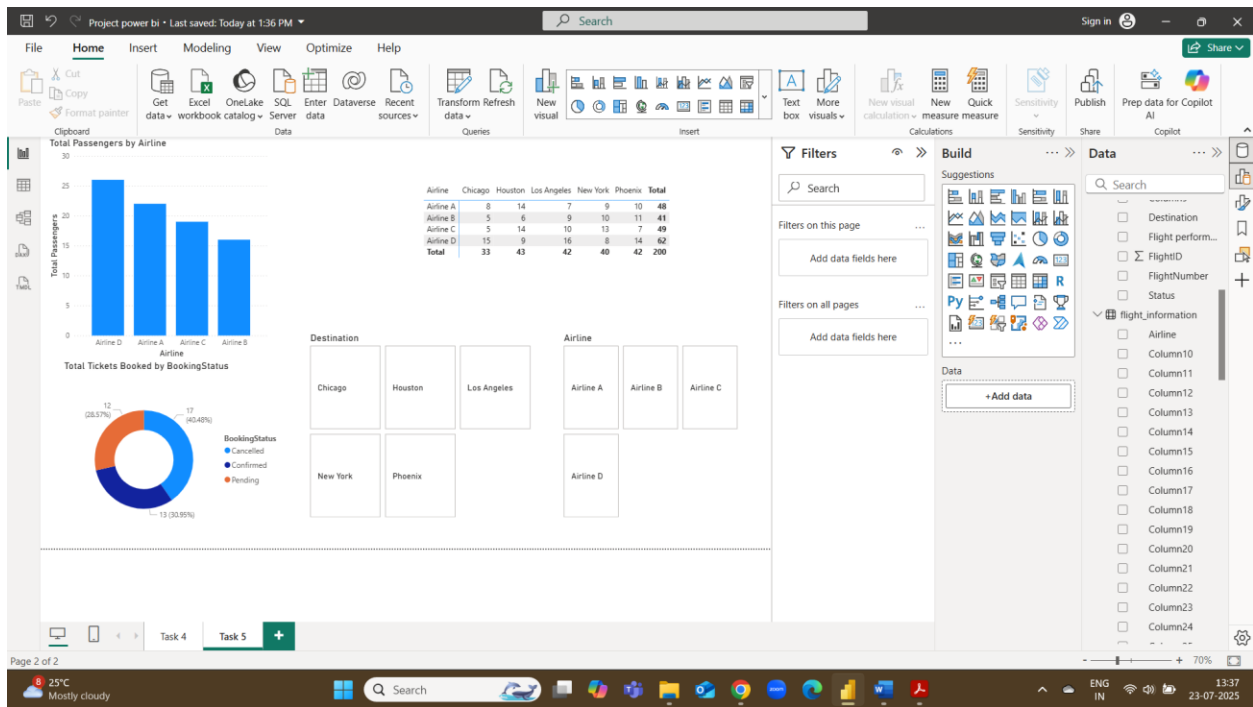
5. Visualization and Interactive Features (20 Marks)

Create visuals for:

- **Passenger count by airline:**
 - Use a Column Chart.
 - X-axis: Airline (from Flight_Information)
 - Y-axis: Total Passengers
- **Ticket booking statuses:**
 - Use a Donut Chart.
 - Legend: Booking Status (from Ticket_Information)
 - Values: Total Tickets Booked
- **Flights by airline and destination:**
 - Used a Matrix visual.
 - For Matrix: Rows: Airline, Columns: Destination, Values: Count of FlightID

Add interactive features for:

- **Destination and Airline:**
 - Add two Slicer visuals to report page.
 - One Slicer: Destination (from Flight_Information)
 - Second Slicer: Airline (from Flight_Information)
 - Ensure all relevant visuals interact with these slicers (default behavior).



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