POWER BI PROJECT: Airline Performance Analysis using Power BI

Task-1: Date Preparation and Cleaning:

- **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.**

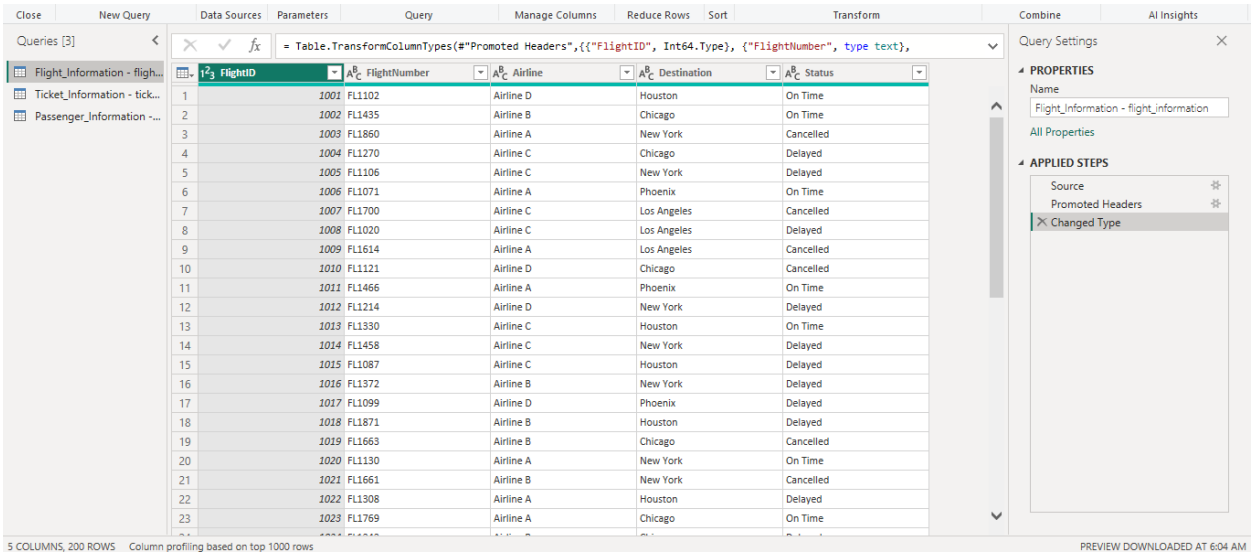
Steps to Extract and transform data in Power Query, are as follows:

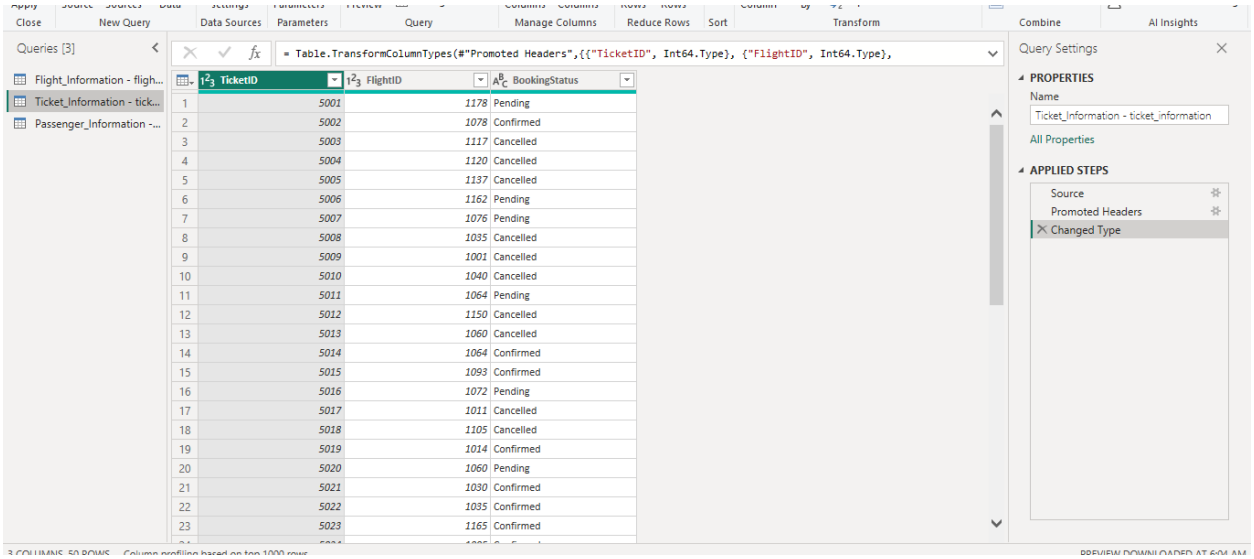
- Open Power BI Desktop > Load the 3 datasets respectively.
- Go to Ribbon > Transform data in Home
- New window would appear, that is the Power Query.

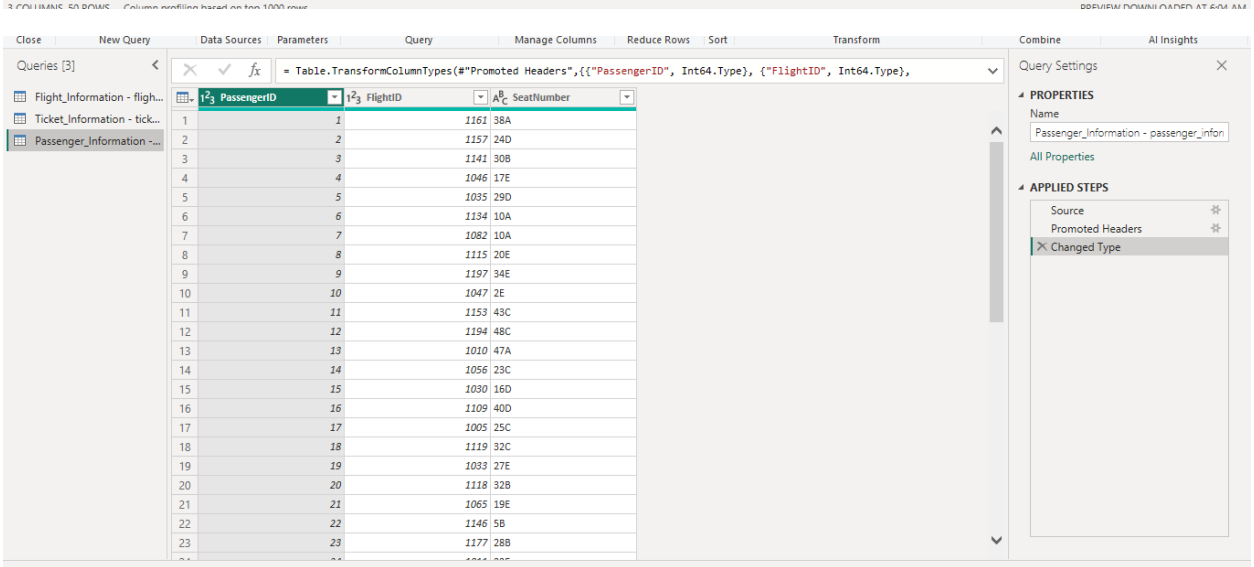
Steps to Clean data, are as follows:

NOTE: The data is clean and well-prepared. So, there is nothing to be clean in datasets.

- **Remove Duplicates:**
  - Select entire table: 1-1
  - Go to Home > Remove Rows > Remove Duplicates in Ribbon.
- **Missing Values:**
  - Select columns with missing values like, null value
  - Go to Home > Replace values > enter values > click Ok
  - Go to Home > Remove Rows > Remove blank rows in Ribbon
  - Go to Home > Remove Rows > Remove errors in Ribbon
- **Format Columns:**
  - Ensure data columns with appropriate data types.
    - Like PassengerID, TicketID, and FlightID are Whole number
    - FlightNumber, SeatNumber, BookingStatus, Airline, Destination, Status are Text


Close
New Query
Data Sources
Parameters
Query
Manage Columns
Reduce Rows
Sort
Transform
Combine
AI Insights
Queries [3]
Flight_Information - fligh...
Ticket_Information - tick...
Passenger_Information -...
= Table.TransformColumnTypes(#"Promoted Headers",{{"FlightID", Int64.Type}, {"FlightNumber", type text},
FlightID
FlightNumber
Airline
Destination
Status
1001 FL1102 Airline D Houston On Time
1002 FL1435 Airline B Chicago On Time
1003 FL1860 Airline A New York Cancelled
1004 FL1270 Airline C Chicago Delayed
1005 FL1106 Airline C New York Delayed
1006 FL1071 Airline A Phoenix On Time
1007 FL1700 Airline C Los Angeles Cancelled
1008 FL1020 Airline C Los Angeles Delayed
1009 FL1614 Airline A Los Angeles Cancelled
1010 FL1121 Airline D Chicago Cancelled
1011 FL1466 Airline A Phoenix On Time
1012 FL1214 Airline D New York Delayed
1013 FL1330 Airline C Houston On Time
1014 FL1458 Airline C New York Delayed
1015 FL1087 Airline C Houston Delayed
1016 FL1372 Airline B New York Delayed
1017 FL1099 Airline D Phoenix Delayed
1018 FL1871 Airline B Houston Delayed
1019 FL1663 Airline B Chicago Cancelled
1020 FL1130 Airline A New York On Time
1021 FL1661 Airline B New York Cancelled
1022 FL1308 Airline A Houston Delayed
1023 FL1769 Airline A Chicago On Time
Query Settings
PROPERTIES
Name
Flight_Information - flight_information
All Properties
APPLIED STEPS
Source
Promoted Headers
Changed Type
5 COLUMNS, 200 ROWS
Column profiling based on top 1000 rows
PREVIEW DOWNLOADED AT 6:04 AM


Close
New Query
Data Sources
Parameters
Query
Manage Columns
Reduce Rows
Sort
Transform
Combine
AI Insights
Queries [3]
Flight_Information - fligh...
Ticket_Information - tick...
Passenger_Information -...
= Table.TransformColumnTypes(#"Promoted Headers",{{"TicketID", Int64.Type}, {"FlightID", Int64.Type},
TicketID
FlightID
BookingStatus
5001 1178 Pending
5002 1078 Confirmed
5003 1117 Cancelled
5004 1120 Cancelled
5005 1137 Cancelled
5006 1162 Pending
5007 1076 Pending
5008 1035 Cancelled
5009 1001 Cancelled
5010 1040 Cancelled
5011 1064 Pending
5012 1150 Cancelled
5013 1060 Cancelled
5014 1064 Confirmed
5015 1093 Confirmed
5016 1072 Pending
5017 1011 Cancelled
5018 1105 Cancelled
5019 1014 Confirmed
5020 1060 Pending
5021 1030 Confirmed
5022 1035 Confirmed
5023 1165 Confirmed
Query Settings
PROPERTIES
Name
Ticket_Information - ticket_information
All Properties
APPLIED STEPS
Source
Promoted Headers
Changed Type

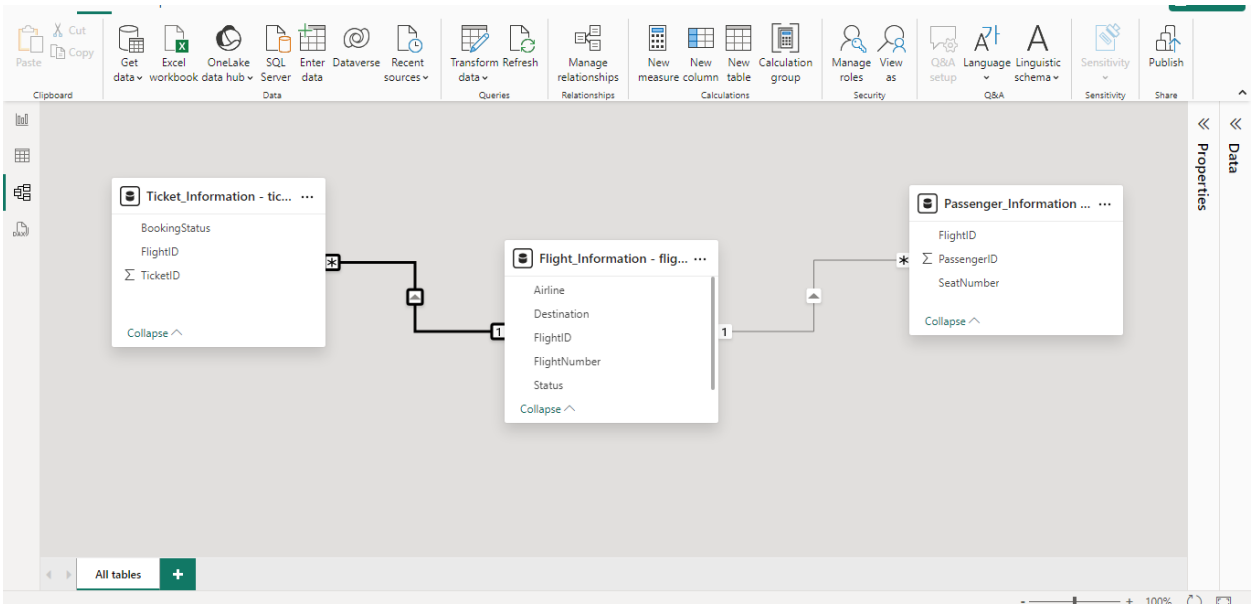

Close
New Query
Data Sources
Parameters
Query
Manage Columns
Reduce Rows
Sort
Transform
Combine
AI Insights
Queries [3]
Flight_Information - fligh...
Ticket_Information - tick...
Passenger_Information -...
= Table.TransformColumnTypes(#"Promoted Headers",{{"PassengerID", Int64.Type}, {"FlightID", Int64.Type},
PassengerID
FlightID
SeatNumber
1 1161 38A
2 1157 24D
3 1141 30B
4 1046 17E
5 1035 29D
6 1134 10A
7 1082 10A
8 1115 20E
9 1197 34E
10 1047 2E
11 1153 43C
12 1194 48C
13 1010 47A
14 1056 23C
15 1030 16D
16 1109 40D
17 1005 25C
18 1119 32C
19 1033 27E
20 1118 32B
21 1065 19E
22 1146 5B
23 1177 28B
Query Settings
PROPERTIES
Name
Passenger_Information - passenger_infor
All Properties
APPLIED STEPS
Source
Promoted Headers
Changed Type

Task-2: Data Modeling:

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

Steps to create relationships, are as follows:

- Go to Model View in power bi desktop.
- Drag FlightID from Flight to Ticket table.
    - Set up:
        - Cardinality to One-Many
        - Cross-filter direction to single
- Drag FlightID from Flight to Passenger table.
    - Set up:
        - Cardinality to One-Many
        - Cross-filter direction to single

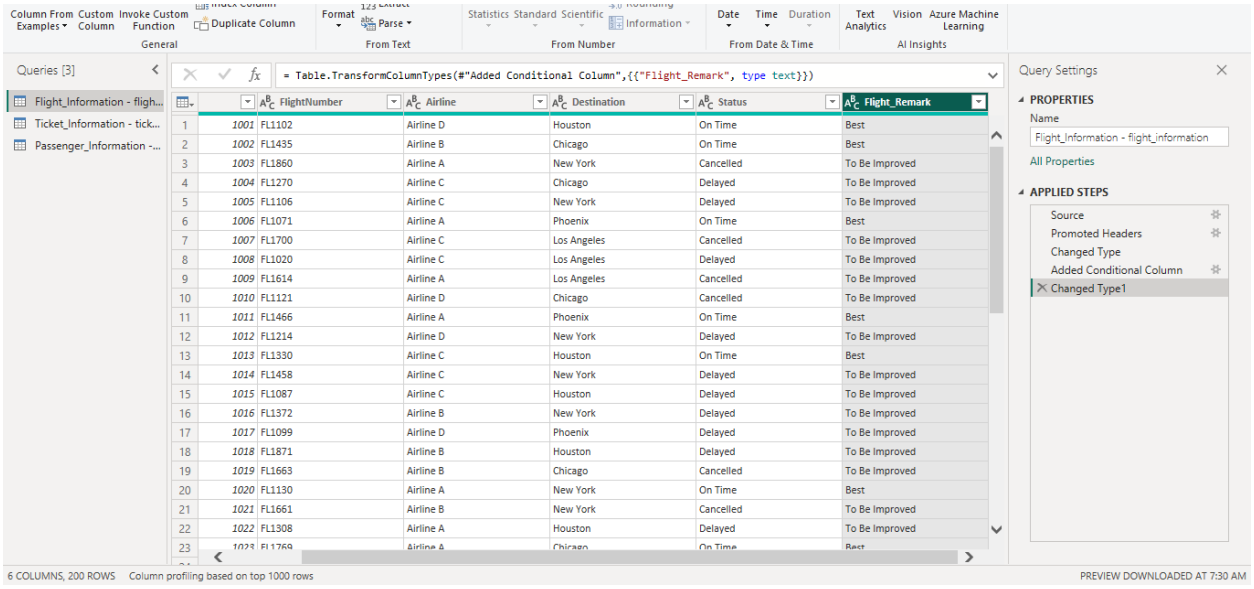


Task-3: Enhanced Data Insights:

- **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 to add conditional column, are as follows:

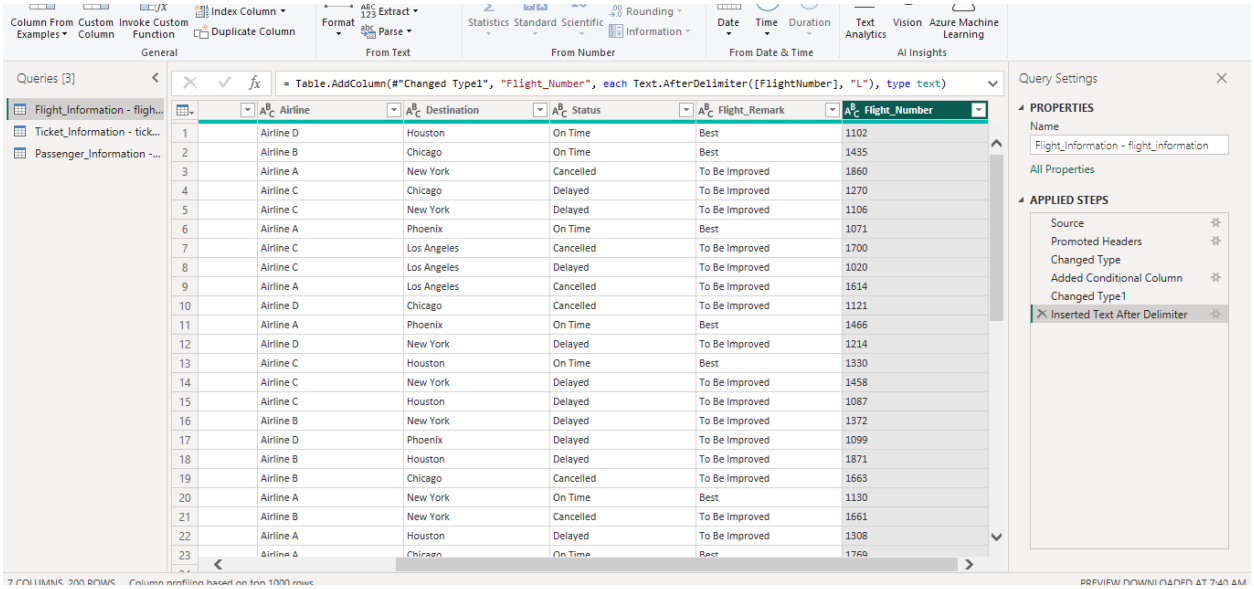
- Go to Report View
- Go to Transform Data: Home > Transform Data
- In Flight table:
    - Go to Add Column > Conditional Column
    - Set up the column:
        - Name: Flight_Remark
        - If: Status – equals – On Time – Best
        - Else: To Be Improved
        - Set data type to text



Steps to extract the flight number from FlightNumber using Column from Examples:

- In Flight Table:
    - Select the FlightNumber column
    - Add column > Column from example

- Set up the column:
  - Name: Flight_Number
  - Enter: 1102(enter the number part only from flightNumber)
  - Press Enter

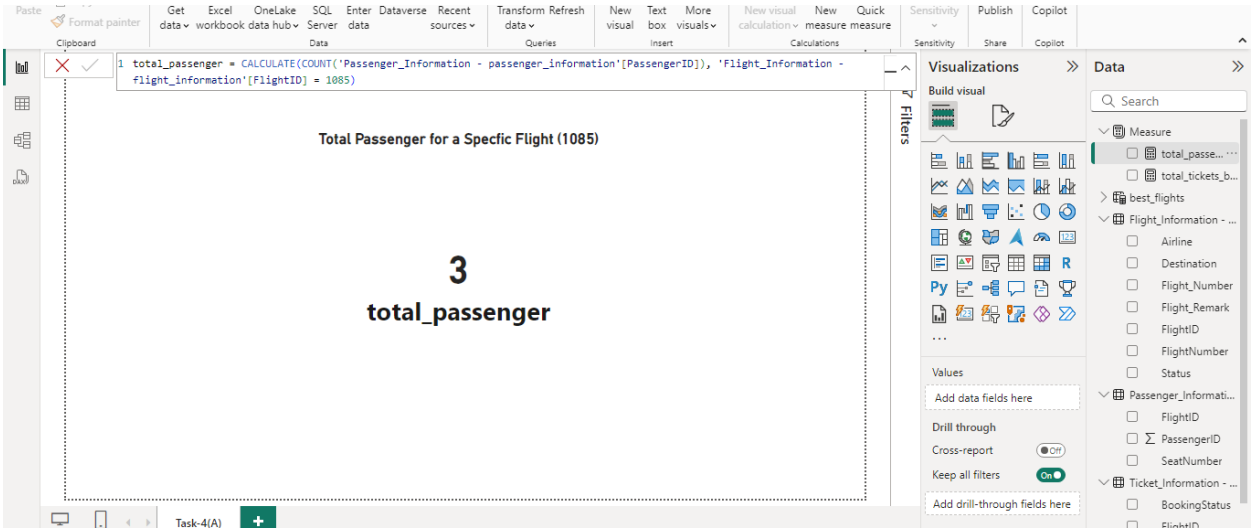


Task-4: Calculations Using DAX:

- **Calculate:**
  - **Total passengers for a specific flight.**
  - **Total tickets booked.**
  - **Filtered table showing "Best" flights only.**
- **Deliverables: Screenshot of DAX calculations and results.**

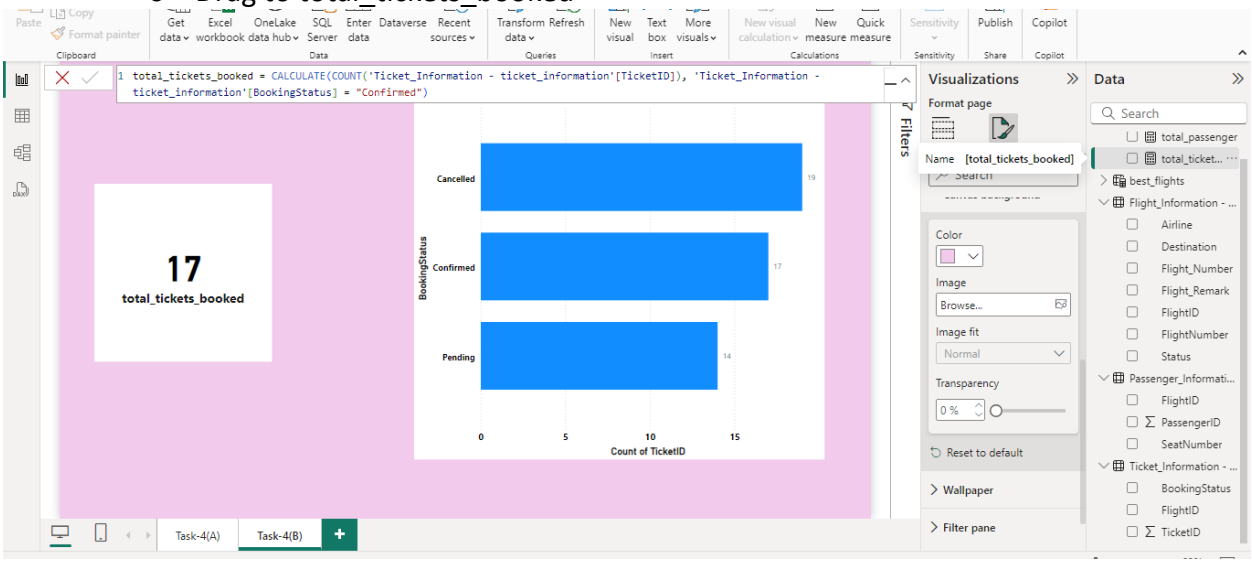
Steps to calculate total passengers for a specific flight, are as follows:

- Go to Report View
- Right click on Measure table > New Measure
  - DAX Formula:
    - total_passenger = CALCULATE(COUNT('Passenger_Information - passenger_information'[PassengerID]), 'Flight_Information - flight_information'[FlightID] = 1085)



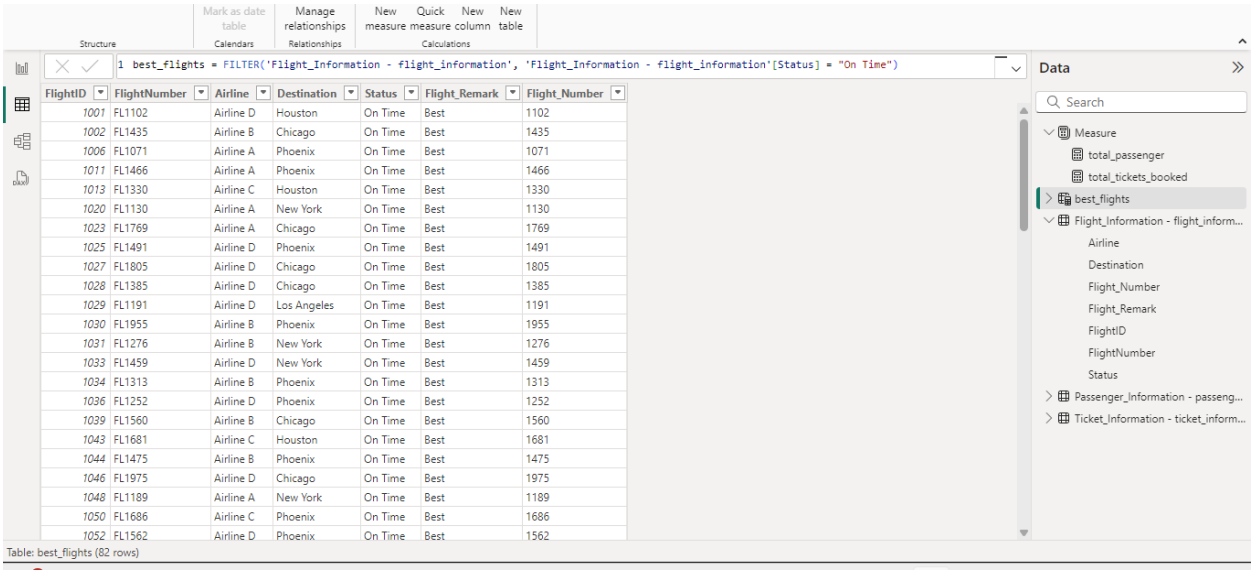
Steps to calculate total tickets booked, are as follows:

- Go to Report View
- Right click on Measure table > New Measure
    - DAX Formula:
        - total_tickets_booked = CALCULATE(COUNT('Ticket_Information - ticket_information'[TicketID]), 'Ticket_Information - ticket_information'[BookingStatus] = "Confirmed")
- Insert Single row card from Visualization pane:
    - Drag to total_tickets_booked



Steps to filtered table showing “Best” flight only, are as follows:

- Go to Report View
- Go to Ribbon > Modeling in Home
    - Click New Table:
        - DAX Formula:
            - best_flights = FILTER('Flight_Information - flight_information', 'Flight_Information - flight_information'[Status] = "On Time")



FlightID	FlightNumber	Airline	Destination	Status	Flight_Remark	Flight_Number
1001	FL1102	Airline D	Houston	On Time	Best	1102
1002	FL1435	Airline B	Chicago	On Time	Best	1435
1006	FL1071	Airline A	Phoenix	On Time	Best	1071
1011	FL1466	Airline A	Phoenix	On Time	Best	1466
1013	FL1330	Airline C	Houston	On Time	Best	1330
1020	FL1130	Airline A	New York	On Time	Best	1130
1023	FL1769	Airline A	Chicago	On Time	Best	1769
1025	FL1491	Airline D	Phoenix	On Time	Best	1491
1027	FL1805	Airline D	Chicago	On Time	Best	1805
1028	FL1385	Airline D	Chicago	On Time	Best	1385
1029	FL1191	Airline D	Los Angeles	On Time	Best	1191
1030	FL1955	Airline B	Phoenix	On Time	Best	1955
1031	FL1276	Airline B	New York	On Time	Best	1276
1033	FL1459	Airline D	New York	On Time	Best	1459
1034	FL1313	Airline B	Phoenix	On Time	Best	1313
1036	FL1252	Airline D	Phoenix	On Time	Best	1252
1039	FL1560	Airline B	Chicago	On Time	Best	1560
1043	FL1681	Airline C	Houston	On Time	Best	1681
1044	FL1475	Airline B	Phoenix	On Time	Best	1475
1046	FL1975	Airline D	Chicago	On Time	Best	1975
1048	FL1189	Airline A	New York	On Time	Best	1189
1050	FL1686	Airline C	Phoenix	On Time	Best	1686
1052	FL1562	Airline D	Phoenix	On Time	Best	1562

Task-5: Visualization and Interactive Features:

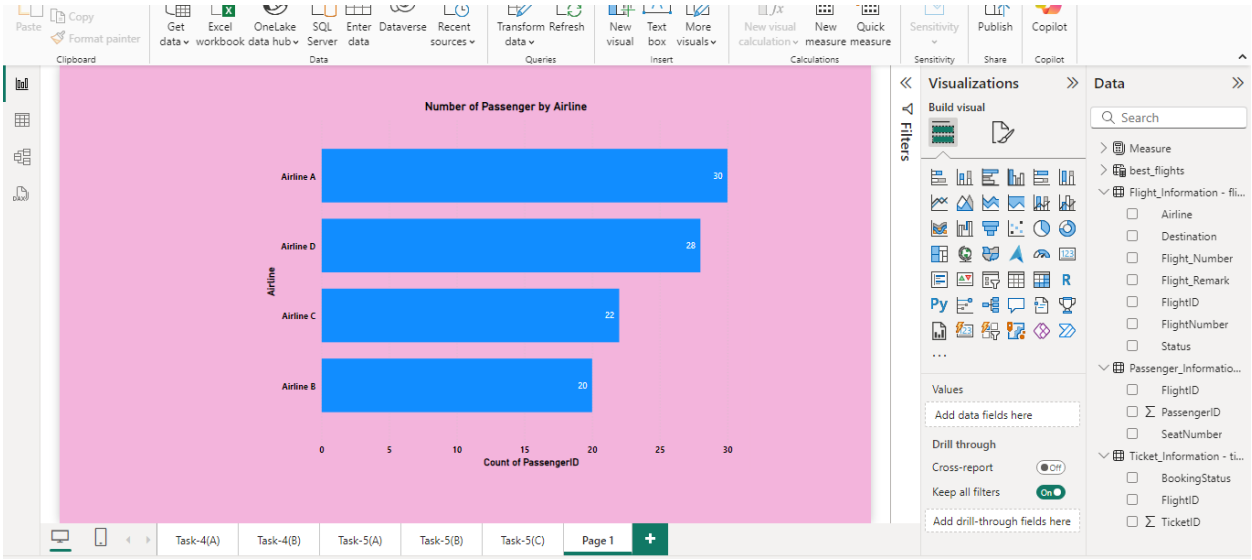
- **Create visuals for:**
    - **Passenger count by airline.**

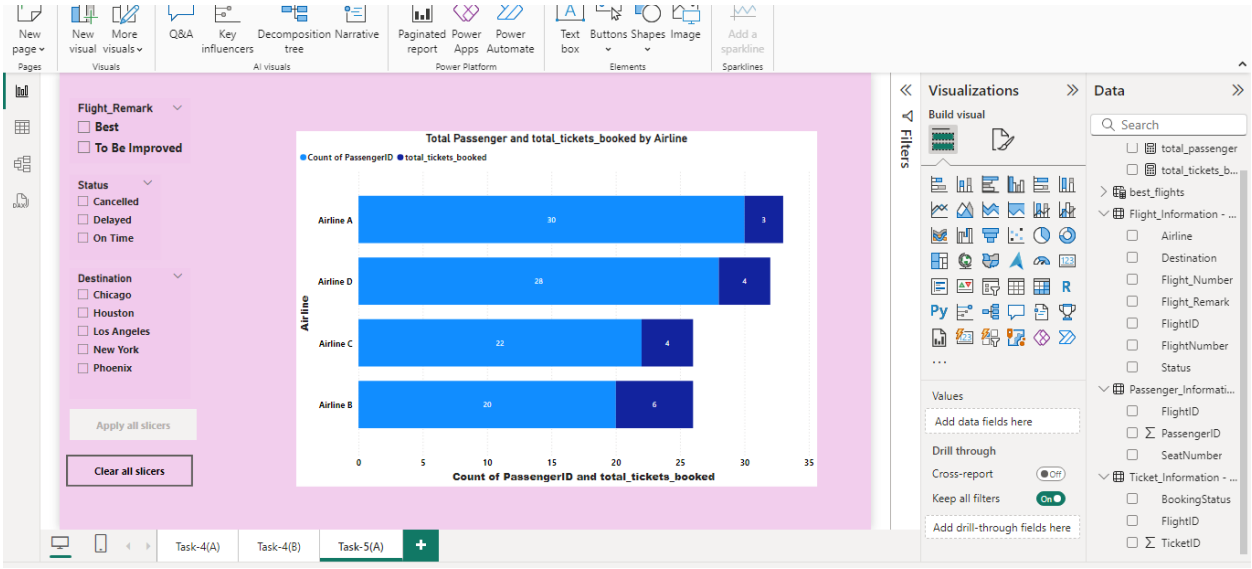
Steps to perform the task, are as follows:

- Go to Report View
- Insert Bar Chart from Visualization Pane
- Set up the Bar chart:
    - Y-Axis: Airline
    - X-Axis: PassengerID(set count as aggregate function) & total_ticket_booked
- Add 3 Slicer: To get more deep Knowledge

- Flight_Remark:
  - Drag Flight_Remark
  - Customized as necessary like background, etc.
- Status:
  - Drag Status
  - Customized as necessary like background, etc.
- Destination:
  - Drag Destination
  - Customized as necessary like background, etc.

- Add Buttons: To apply multi slicer at same time
  - Clear all Slicers
  - Apply all Slicers

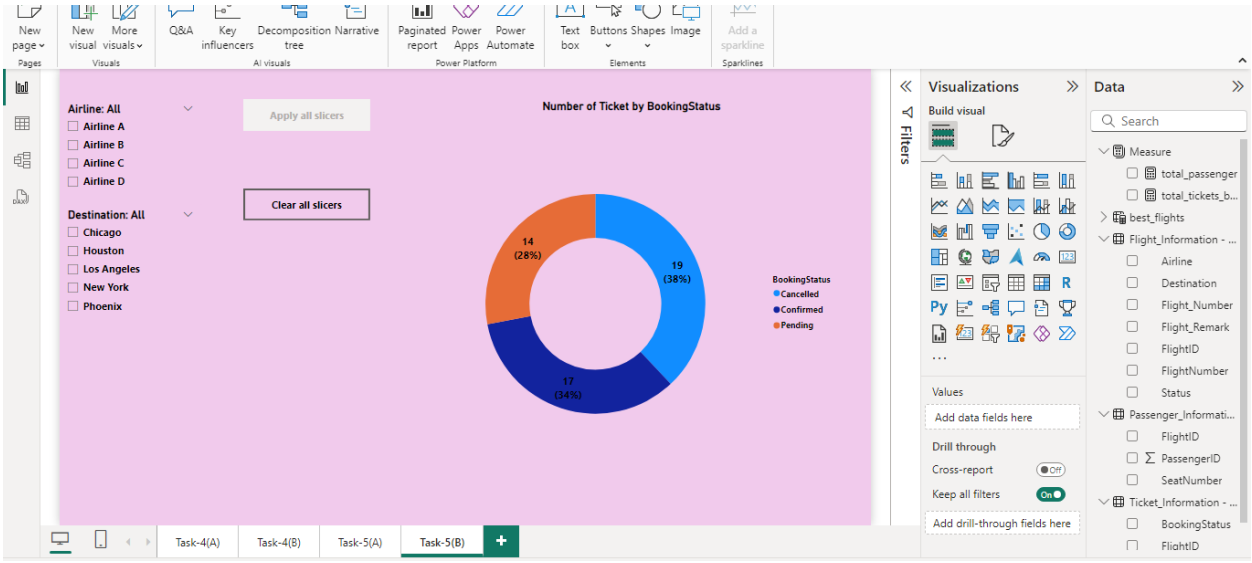




- **Ticket booking statuses.**

Steps to perform the task, are as follows:

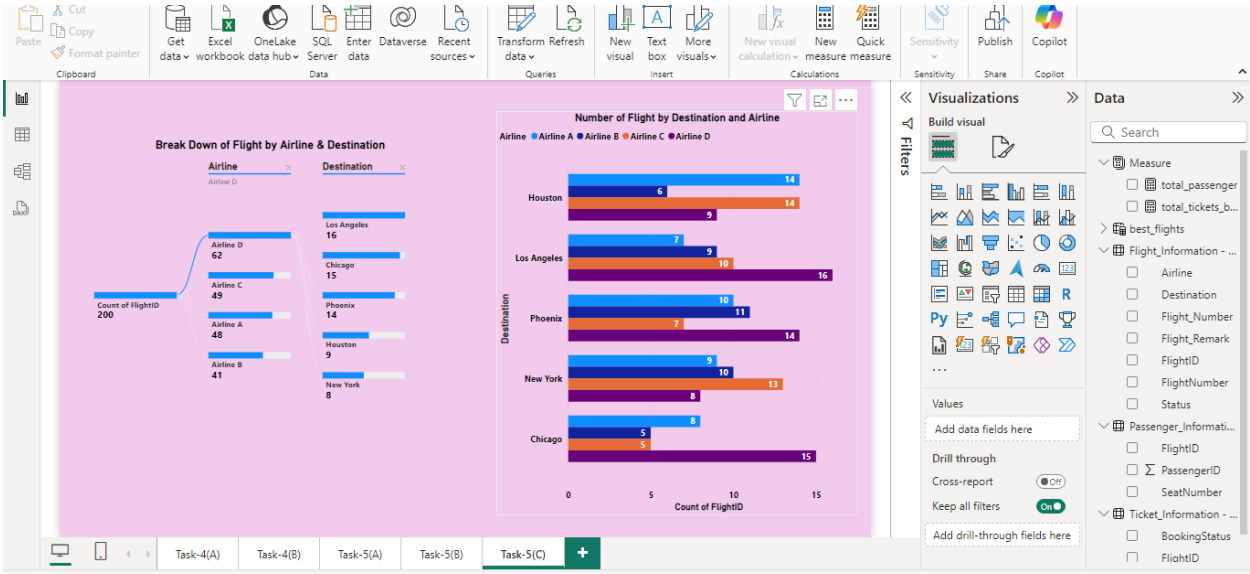
- Go to Report View.
- Insert Donut Chart from Visualization pane.
- Set up the chart:
  - Legend: BookingStatus
  - Values: TicketID(set count as aggerate function)
- Add 2 Slicers:
  - Airline:
    - Drag Airline fields to fields
    - Customize as required like summary, etc.
  - Destination:
    - Drag destination fields to fields
    - Customize as required like summary, etc.
- Add Clear all Slicer Button to clear Multi slicer selection at same time.
- Add Apply all Slicer Button to apply multi slicer selection at same time.



- **Flights by airline and destination.**

Steps to perform the task, are as follows:

- Go to Report View
- Insert Clustered Bar chart from Visualization Pane:
  - Set up the chart:
    - Y-Axis: Destination
    - X-Axis: FlightID(set count as aggerate function)
    - Legend: Airline
    - Customize as required.
- Insert Decomposition Tree from Visualization Pane:
  - Set up the tree:
    - Analyze: FlightID(set count as aggerate function)
    - Explain By: Airline, Destination

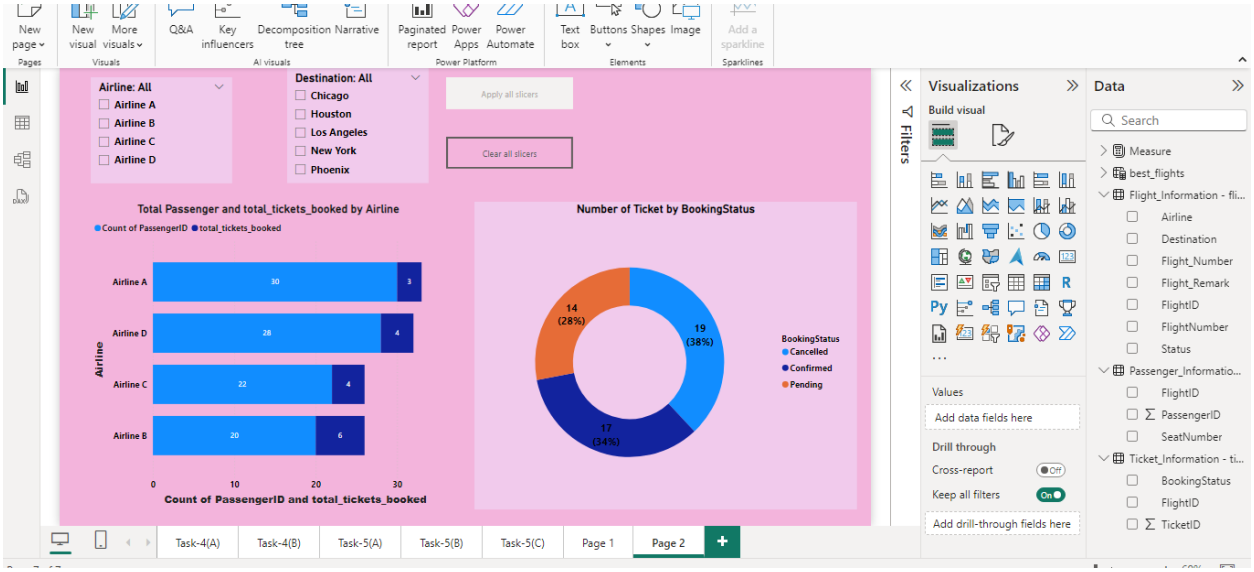


- **Add interactive features for:**
  - **Destination and Airline.**

Steps to perform, the task are as follows:

- Go to Report View
- Insert Bar Chart from Visualization Pane
- Set up the Bar chart:
  - Y-Axis: Airline
  - X-Axis: PassengerID (set count as aggregate function) & total_ticket_booked
- Insert Donut Chart from Visualization pane.
- Set up the chart:
  - Legend: BookingStatus
  - Values: TicketID(set count as aggerate function)
- Add Slicer: To get more deep Knowledge
  - Status:
    - Drag Status
    - Customized as necessary like background, etc.
  - Destination:
    - Drag Destination
    - Customized as necessary like background, etc.
- Add Buttons: To apply multi slicer at same time

- Clear all Slicers
- Apply all Slicers

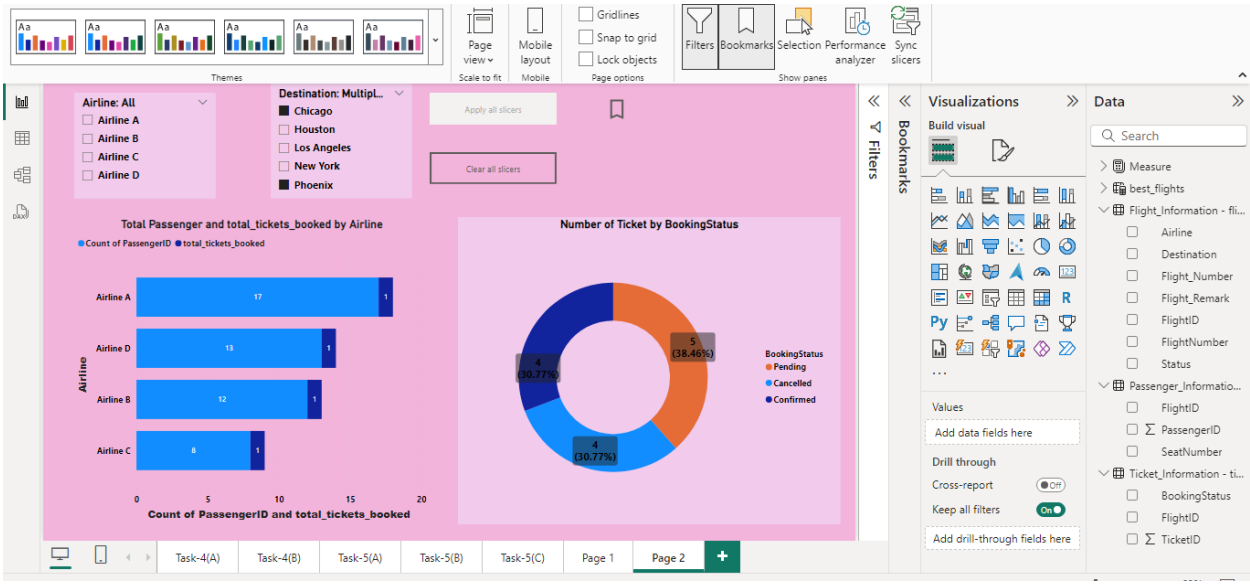


- **Quick views.**

Steps to perform the task, are as follows:

- Go to Report View
- Insert Bar Chart from Visualization Pane
- Set up the Bar chart:
  - Y-Axis: Airline
  - X-Axis: PassengerID (set count as aggregate function) & total_ticket_booked
- Insert Donut Chart from Visualization pane.
- Set up the chart:
  - Legend: BookingStatus
  - Values: TicketID(set count as aggerate function)
- Insert a BookMark > Insert > Buttons > BookMark:
  - Set up the Bookmark:
    - Select Chicago and Phoenix from destination Slicer
    - Apply all slicers
    - Go to View in Ribbon
    - Click Bookmark next to filter.
    - Bookmark Pane would appear

        - Click on Add and rename to “Chicago & Phoenix”
        - Click on Bookmark Icon in the report view
        - Expand Action > Select Chicago & Phoenix in Bookmark
- Add Slicer: To get more deep Knowledge
    - Status:
        - Drag Status
        - Customized as necessary like background, etc.
    - Destination:
        - Drag Destination
        - Customized as necessary like background, etc.
- Add Buttons: To apply multi slicer at same time
    - Clear all Slicers
    - Apply all Slicers



- **Airline-specific pages.**

Steps to perform the task, are as follows:

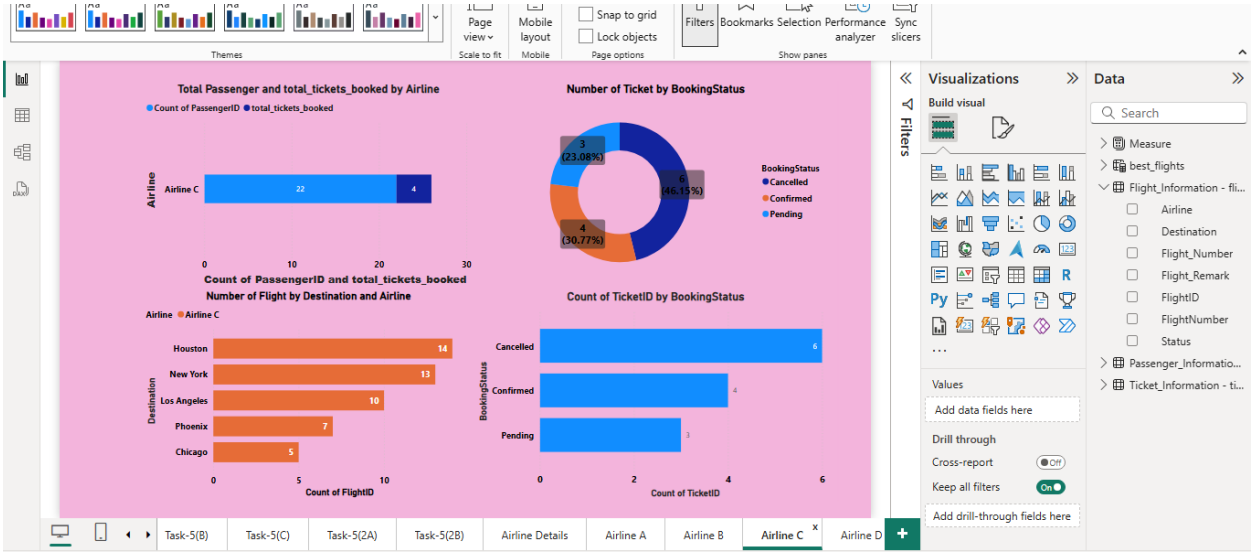
- Go to Report View As “Airline Details”
- Insert different visuals from Visualization Pane:
    - Bar Chart: To total passenger & ticket_booked by Airline
        - Y-Axis: Airline
        - X-Axis: total_tickeds_booked, PassengerID(set count as aggerate function)

        - Customize as per ones need.
    - Donut Chart: Number of tickets by BookingStatus
        - Legend: BookingStatus
        - Values: TicketID(set count as aggerate function)
        - Customize as per ones need.
    - Clustered Bar Chart: Number of Airline by Destination & Airline
        - Y-Axis: Destination
        - X-Axis: FlightID(set count as aggregate function)
        - Legend: Airline
        - Customize as per ones need.
    - Stacked Bar Chart: Count of Tickets by bookingstatus
        - Y-Axis: BookingStatus
        - X-Axis: TicketID(set count as aggerate function)
- Insert 4 blank buttons:
    - Go to Insert > Buttons > Blank
    - Rename as “Airline A”, “Airline B”, “Airline C” and “Airline D”
    - Go to format button pane in visualization pane
    - Turn on Action toggle & expand action
        - Type: Page Navigation
        - Destination: Airline A
    - Repeat the steps respectively for each button for “Airline B”, “Airline C“, “Airline D”
- Insert buttons:
    - Clear all Slicers
    - Apply all Slicers
- Insert slicers from Visualization pane
    - Drag Airline into fields
- Customize the page layout of the report view
- Add 4 new pages in the canvas: by clicking “+” Icon
    - Airline A, Airline B, Airline C, Airline D
        - Add the different visuals from Airline Details
        - Customize as per needs
        - Repeat the steps for each pages.

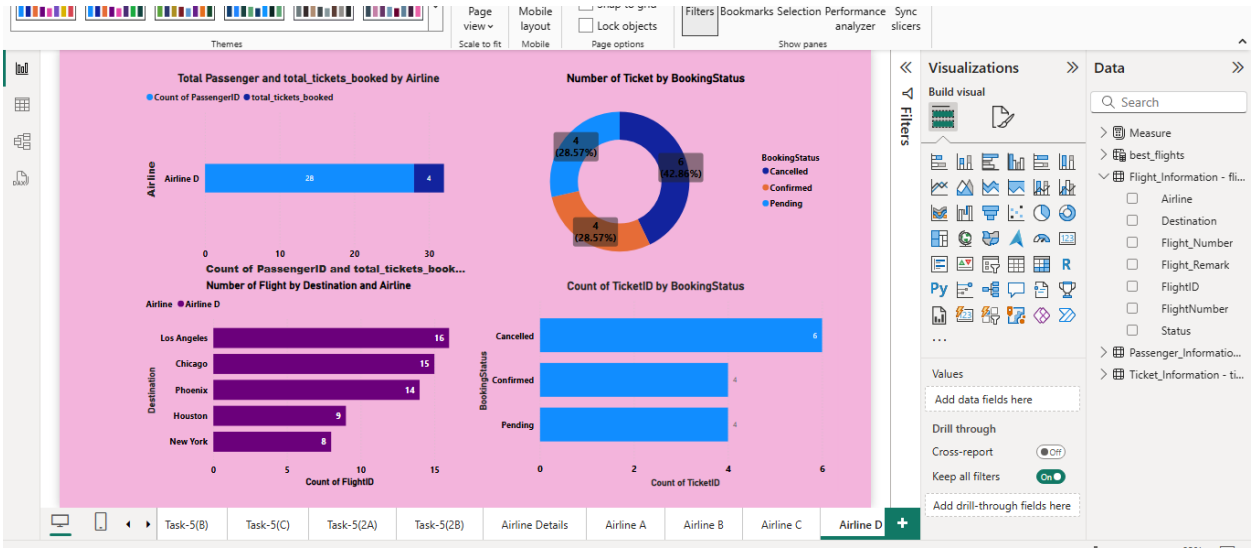
Airline A

Airline B

Airline C



Airline D



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

Task-6: Final Dashboard and Power BI Service

- **Design a comprehensive dashboard with key visuals and insights.**

Steps to perform the task, are as follows:

- Go to Report View in new page of canvas.
- Add different visuals in canvas from visualization pane:
  - Stacked Bar Chart: total_tickets_booked by Airline
    - Insert Bar Chart from Visualization Pane
    - Set up the Bar chart:
      - Y-Axis: Airline
      - X-Axis: PassengerID (set count as aggregate function) & total_ticket_booked
  - Stacked Bar Chart: total passenger & total_tickets_booked by Airline
    - Insert Bar Chart from Visualization Pane
    - Set up the Bar chart:
      - Y-Axis: Airline

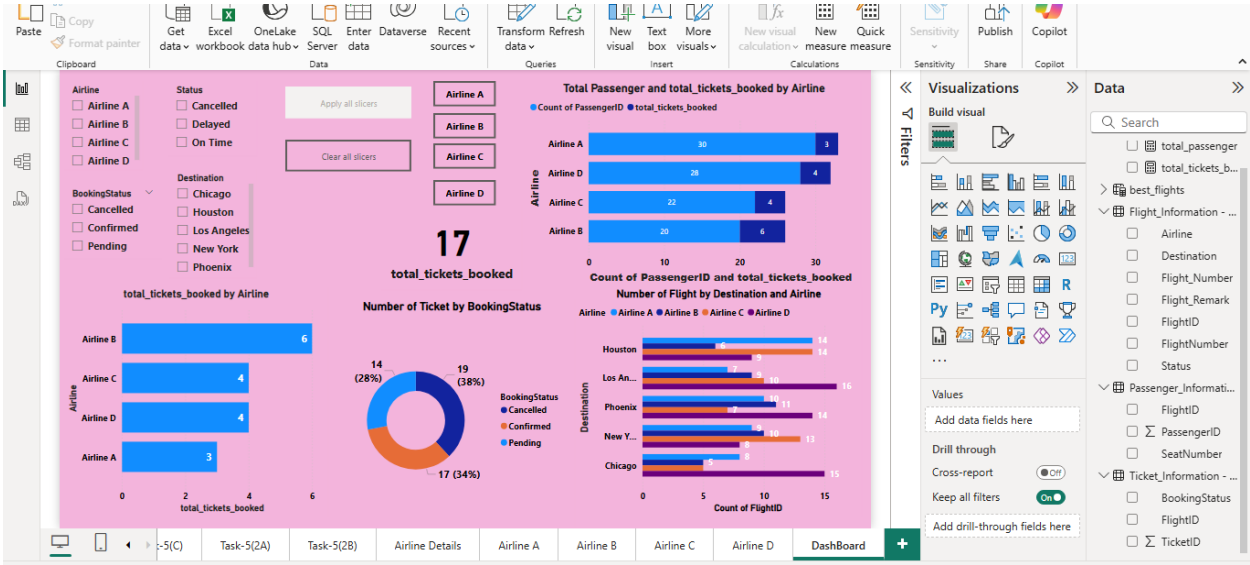
                - X-Axis: PassengerID (set count as aggregate function) & total_ticket_booked
    - Donut Chart: Number of tickets by Bookingstatus
        - Insert Donut Chart from Visualization pane.
        - Set up the chart:
            - Legend: BookingStatus
            - Values: TicketID(set count as aggerate function)
    - Clustered Bar Chart: Number of Flights by Destination & Airline
        - Insert Clustered Bar chart from Visualization Pane:
        - Set up the chart:
            - Y-Axis: Destination
            - X-Axis: FlightID(set count as aggerate function)
            - Legend: Airline
            - Customize as required.
    - Single Row Card: total_tickets_booked
        - Insert Single row card from Visualization pane:
        - Drag to total_tickets_booked

Added slicers:

- Add 4 Slicers:
    - Airline:
        - Drag Airline to fields
        - Customize as per ones need
    - BookingStatus:
        - Drag BookingStatus to fields
        - Customize as per ones need
    - Status:
        - Drag Status to fields
        - Customize as per ones need
    - Destination:
        - Drag Destination to fields
        - Customize as per ones need

Added buttons:

- Clear all Slicers
- Apply all Slicers



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

Steps to perform the task, are as follows:

- Go to Modeling > Manage Roles in Ribbon
  - Create a role called Airline A.
  - Click on Flight_infomation table
  - In filter data:
    - Click New & Set up:
      - Column: Airline
      - Condition: Equals
      - Value: Airline A
      - Click on Switch to DAX editor & check the condition
      - Click on Save & Close
  - Go to Modeling > View as > Select Airline A to test the RLS.

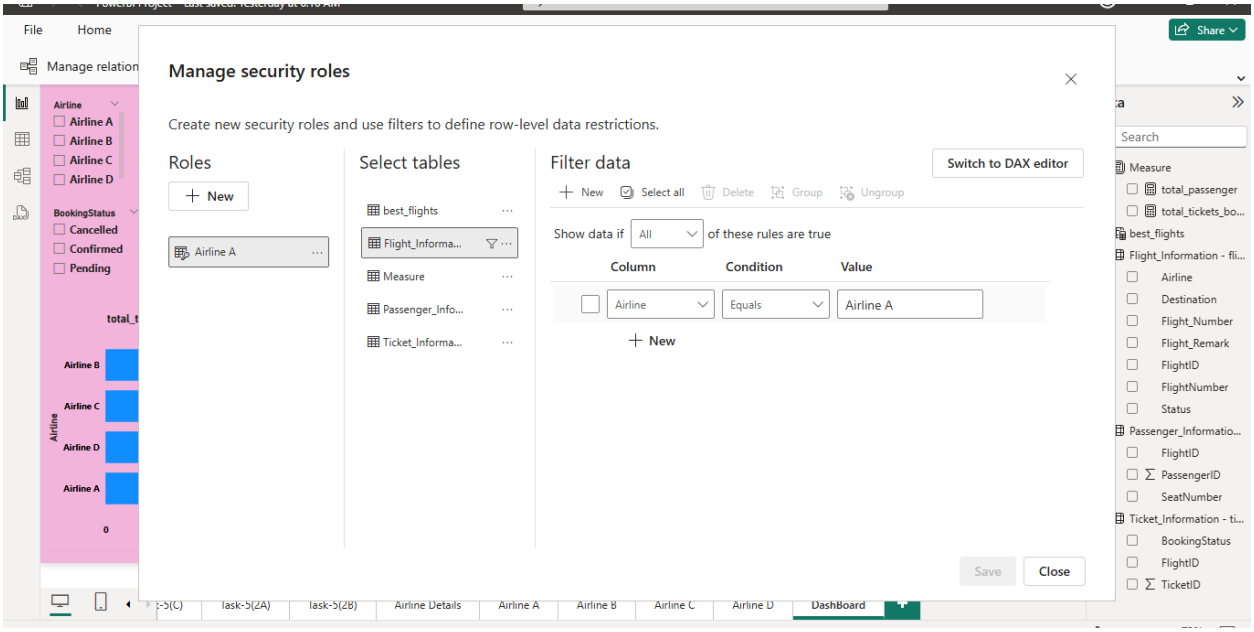
Steps to Public it to PowerBI Service, are as follows:

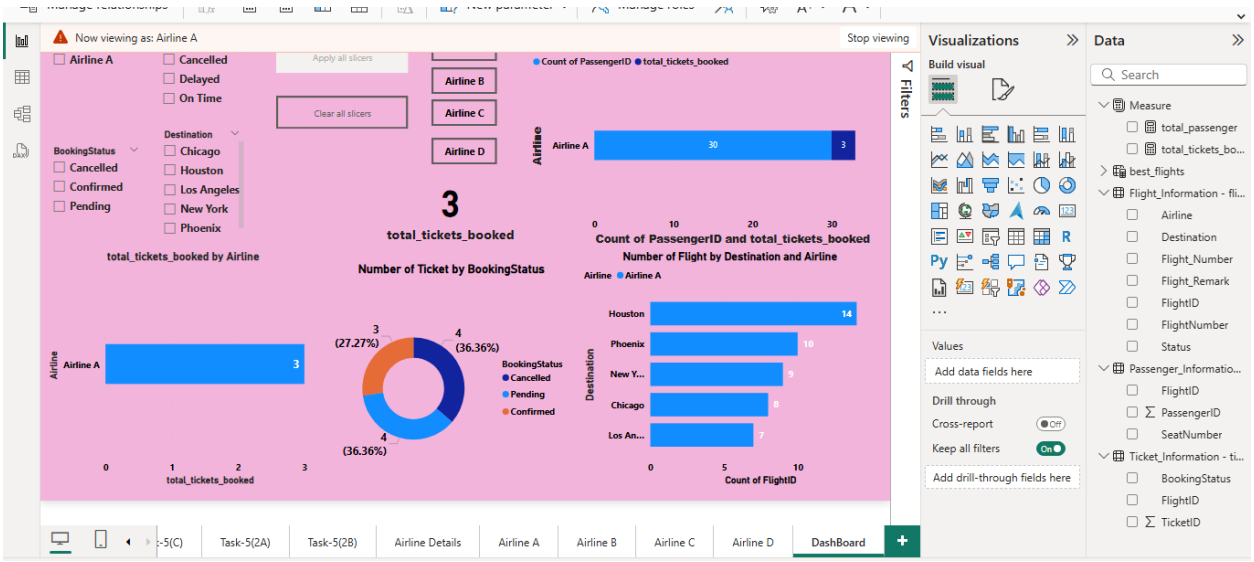
- Go to Home > Publish > Enter email.
- Pop up window would appear
- Wait to until you can see a success with green color in the pop window.

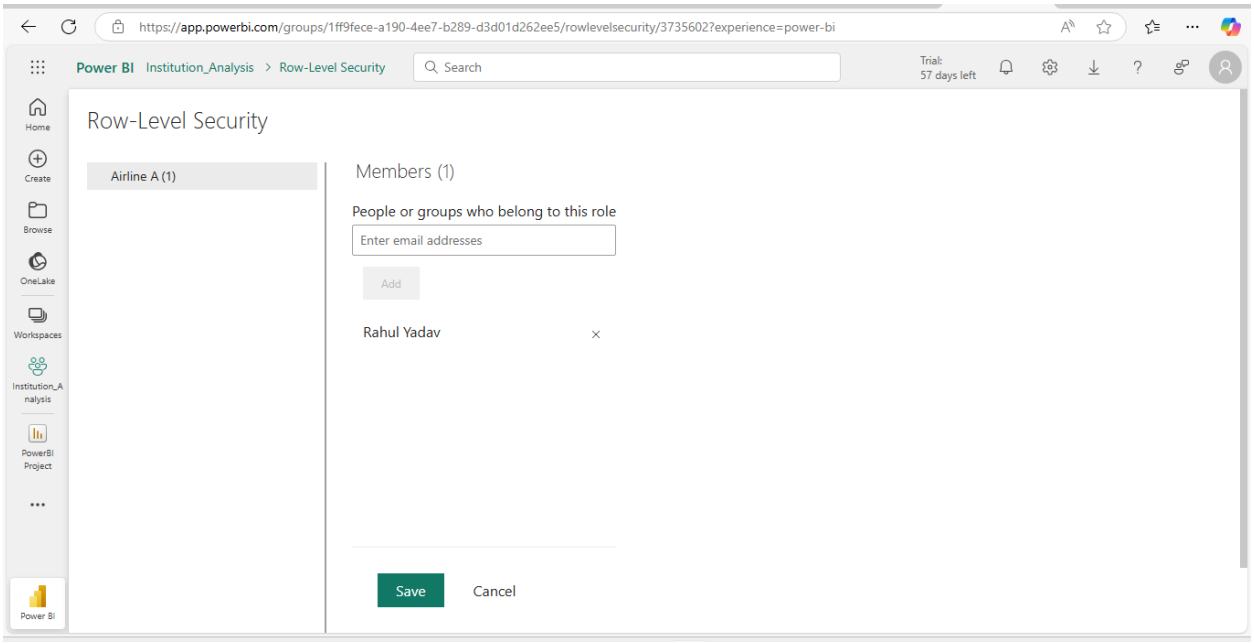
Steps to Assign Airline A RLS to a user, are as follows:

- Go to Institution_Analysis workspace. Where you public the report.

- Go to data or semantic & click on 3 dots:
    - Select Security:
        - Row Level Security, window would appear.
            - Enter Email ID to which you want to assign the role;
            - Here its me, so: rahul.20bcon137@jececu.edu.in
            - Click on Add & Save.



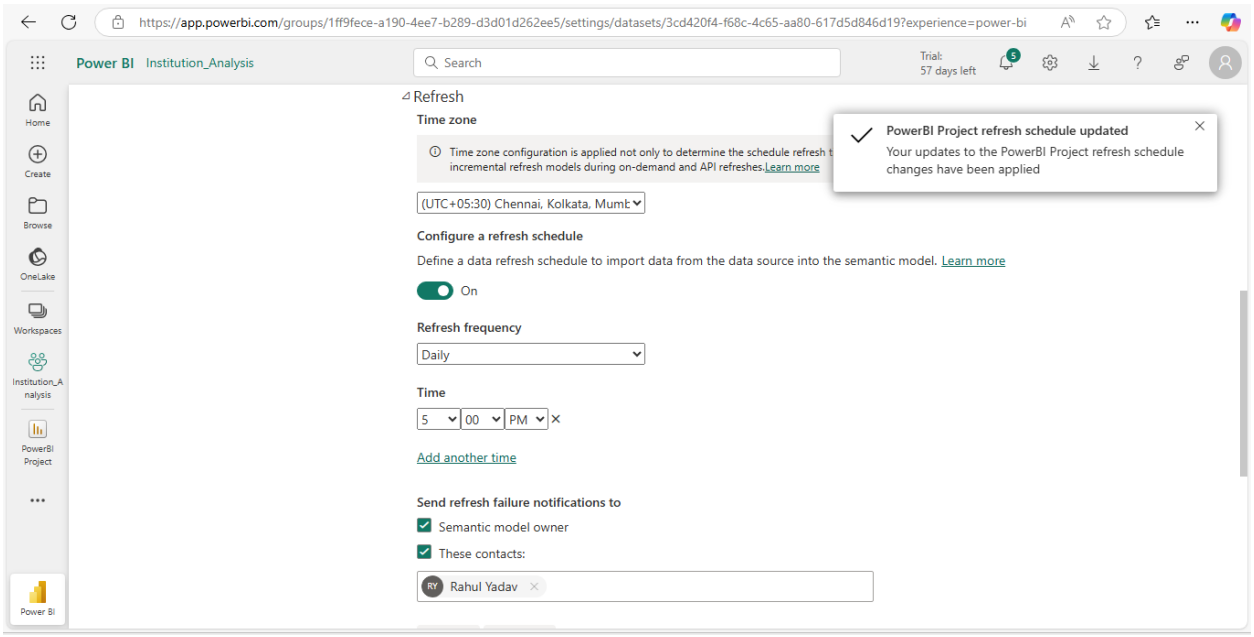




- **Set up a schedule refresh at 5 PM daily.**

Steps to perform the task, are as follows:

- Go to Institution_Analysis workspace
- Go to data or semantic & click on 3 dots:
    - Select setting:
        - Set up the data source credentials by sing in.
        - Schedule refresh:
            - Select the time zone
            - Turn on “Configure a refresh schedule”
            - Set refresh frequency to daily
            - Click Add another time below Time
            - Set the time to 5 PM
            - Enter the email in send refresh failure notification
            - Click Apply



➢ Deliverables: Screenshot of the published dashboard and RLS configuration.