**AIRLINES OPERATIONS ANALYSIS – Task Explanation**

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**Task 1 - Data Extraction and Transformation in Power Query:**

**Solution –**

* Selected First Row as Headers.
* Removed Null columns from the end for ticket\_information dataset.
* Selected all, removed Duplicate and Blank rows and Errors.
* Checked Data type for all columns and corrected them.
* No null values were present in dataset, our files are ready for building model and visuals.

**Task 2 - Conditional and Custom Columns:**

**Solution –** Go to Power Query Editor and open Flight\_information dataset. Go to Add Column > Conditional Column. Select Status column equals to Value On time, then Best and in Else section, type To be improved and create. Our conditional column is ready, change its title from Custom to “Status Feedback”.

**Task 3 - Column from Examples and Replace Values:**

**Solution –** Go to Power Query Editor and open Flight\_information dataset. Go to Add Column > Column from Examples. Give column a name like FlightNumber (Number part) and then type the numerical value from FlightNumber in the column. Press CTRL + Apply and the column will get filled automatically.

To standardize Status column, we removed spacebar from “On Time” with hyphen, “On-Time” and then we format whole column to UPPERCASE for consistency.

**Task 4 - Merge Queries and Merge Columns:**

**Solution –** To merge flight\_information and passenger\_information, Go to Power Query Editor > Home > Merge Queries > Merge Queries as new. As Flight dataset has extra rows with no link to FlightID column in Passenger dataset, we will use Right Outer Join to have all rows of Passenger dataset with matching values from Flight dataset, name the dataset “Flight and Passenger Merged”. We perform Right Outer join because flight information with Passenger dataset is required for analysis, extra rows are not useful. Now we select PassengerID and Seat Number column and go to Transform > Merge Columns. Use Hyphen as a separator and name it PassengerID-Seat.

**Task 5 - Create Relationships:**

**Solution –** I had turned off Auto-detect relationships in Local settings. Now, to manually create relationships, go to Model view. As flight\_information is our key dataset that will be the base for passenger and ticket dataset, we keep Flight dataset in center and create One-to-Many cardinal relationship with Passenger and Ticket dataset using FlightID column.

**Task 6 – DAX:**

**Solution –**

* To find total passengers who took a specific flight using FlightNumber, we can create a new measure CALCULATE with CountA to count values in PassengerID column with Filter for FlightNumber = FL1040. Following is the DAX function:

FL1040\_Total\_Passengers=CALCULATE(COUNTA(passenger\_information[PassengerID] ), flight\_information[FlightNumber] = "FL1040")

* For total tickets booked, we generally count Confirmed tickets only, i.e., we will exclude Pending and Cancelled tickets. Create a new Measure and use CALCULATE and CountA function to count TicketID with filter on Booking Status = Confirmed. Following is the DAX function:

Total Confirmed Tickets = CALCULATE(COUNTA(ticket\_information[TicketID]), ticket\_information[BookingStatus] = "Confirmed")

Similarly, we can also add separate count for Pending and Cancelled tickets for better analysis.

* Create a table visual and add columns like FlightID, Destination, and Airline in it. Go to Filter pane and add Status Feedback column (created in Task 2) and select only Best. Now our table will show details of only Best Status flights.

**Task 7 – Visualization:**

**Solution –**

* Create a measure to Calculate total flights for Airline A using CountA function and repeat the measure for Airline B,C, and D.

Flights\_AirlineA = CALCULATE(COUNTA(flight\_information[FlightID]), flight\_ information[Airline] = "Airline A")

* Create a measure to Calculate total passengers for Airline A using CountA function and repeat the measure for Airline B,C, and D.

Passengers\_AirlineA = CALCULATE(COUNTA(passenger\_information[Passenger ID]), flight\_information[Airline] = "Airline A")

* Add a Bar chart visual and drag Airline column to Y-axis section and PassengerID (as Count) to Values/X-axis. Format the visual accordingly.
* Add a Donut Chart visual and drag Status column to Legend, and Airline column to Values. Format the visual accordingly.

**Task 8 - Advanced Visualizations: Decomposition Tree and Key Influencer:**

**Solution –**

* Add a decomposition tree visual and drag FlightID as Count to Visualize, and Airline and Destination columns to Explain by. PassengerID and TicketID can be used as Count in Tooltips for better analysis.
* Add QnA visual to the page. Search “booking status by total ticketID” and it will create a bar chart to show distribution of Total tickets by their Booking Statuses.
* Format both the visuals accordingly.

**Task 9 - Interactive Features: Slicers, Bookmarks, and Drill Through:**

**Solution –**

* Add a Table visual to the page and include columns Airline, PassengerID (as count) and TicketID (as count). Format the table for better visual appeal. Now add a Slicer and drag Destination column to the data field. Now we only want Slicer settings to reflect results on this table only, so unlink Slicer Interactions for other visuals on the page.
* Different Bookmarks have been created for the page to access important analysis quickly
* For Drill Through, create a new page and add a Bar chart visual showing Total Passengers per Airline. Create another page and add a Table visual with Airline, Destination, Status, Total Flights and Passengers column. In Page settings in Format Pane, make it a Drill Through and choose Airline column. Now if we right click on any Airline, suppose B, and go Drill Through, it will show us related data for Airline B only.

**Task 10 - Final Report and Dashboard:**

**Solution –**

* Login to Power Bi Service and go to Workspaces. Create New Workspace titled “Airline by Ashish”, add a description and logo and click Create. Publish the .pbix file from desktop version to Service.
* To assign Row Level Security (RLS), Go to Modelling > Manage Roles. Now create a new Role “Airline A” and select Flight information table. Add a new rule for Airline equal to Airline A and Save. Now role has been created which can be checked in View As option in same Tab. To assign it to a colleague, go to Power BI Cloud and select Semantic model of the project. Right click and go to Security, now type the email of colleague and the role will be assigned to that email.
* Go to Settings > Power Bi Settings > Semantic Models. In Data Source credentials, click on dataset and then sign in to preserve data. In Refresh option, select Daily refresh at 5:00 P.M. and click Apply.