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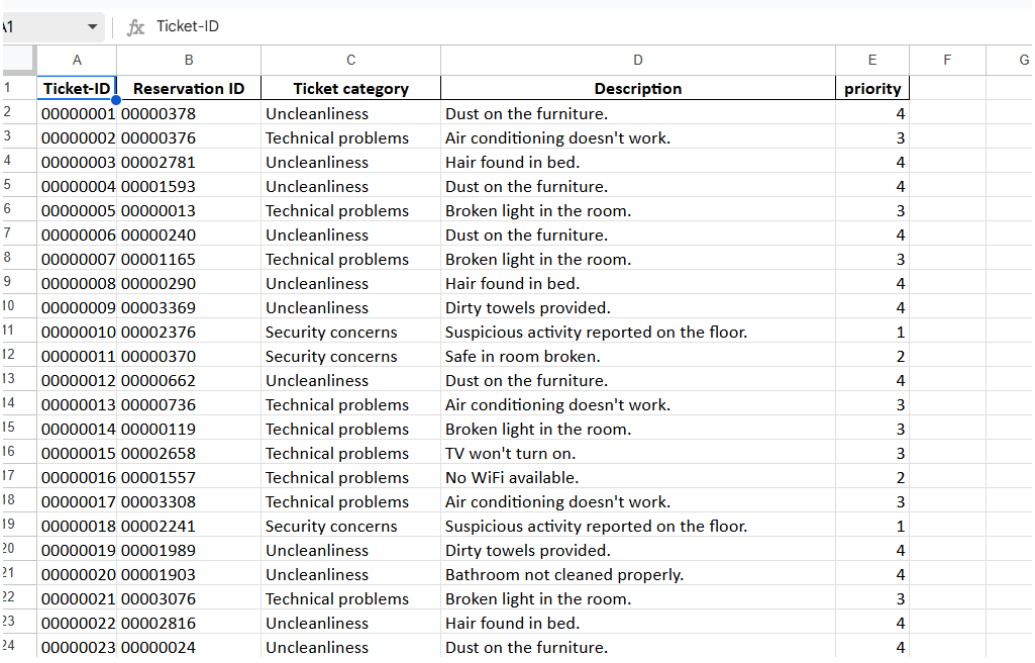
1. The German language content in each sheet of the Hotel Management Data has been converted to English.
   It was difficult to do this in Excel, so I saved the file to Google Drive and used Google Sheets instead.
   The formula used for this (example): =**GOOGLETRANSLATE(A1, "de", "en")**

Ticket-ID	Reservierungs-ID	Ticketkategorie	Beschreibung	Priorität
0000001	00000378	Unsauberkeit	Staub auf den Möbeln.	4
0000002	00000376	Technische Probleme	Klimaanlage funktioniert nicht.	3
0000003	00002781	Unsauberkeit	Haare im Bett gefunden.	4
0000004	00001593	Unsauberkeit	Staub auf den Möbeln.	4
0000005	00000013	Technische Probleme	Kaputtes Licht im Zimmer.	3
0000006	00000240	Unsauberkeit	Staub auf den Möbeln.	4
0000007	00001165	Technische Probleme	Kaputtes Licht im Zimmer.	3
0000008	00000290	Unsauberkeit	Haare im Bett gefunden.	4
0000009	00003369	Unsauberkeit	Schmutzige Handtücher bereitgestellt.	4
0000010	00002376	Sicherheitsbedenken	Verdächtige Aktivitäten auf der Etage gemeldet.	1
0000011	00000370	Sicherheitsbedenken	Safe im Zimmer defekt.	2
0000012	00000662	Unsauberkeit	Staub auf den Möbeln.	4
0000013	00000736	Technische Probleme	Klimaanlage funktioniert nicht.	3
0000014	00000119	Technische Probleme	Kaputtes Licht im Zimmer.	3
0000015	00002658	Technische Probleme	Fernseher lässt sich nicht einschalten.	3
0000016	00001557	Technische Probleme	Kein WLAN verfügbar.	2
0000017	00003308	Technische Probleme	Klimaanlage funktioniert nicht.	3
0000018	00002241	Sicherheitsbedenken	Verdächtige Aktivitäten auf der Etage gemeldet.	1
0000019	00001989	Unsauberkeit	Schmutzige Handtücher bereitgestellt.	4
0000020	00001903	Unsauberkeit	Badezimmer nicht richtig geputzt.	4
0000021	00003076	Technische Probleme	Kaputtes Licht im Zimmer.	3

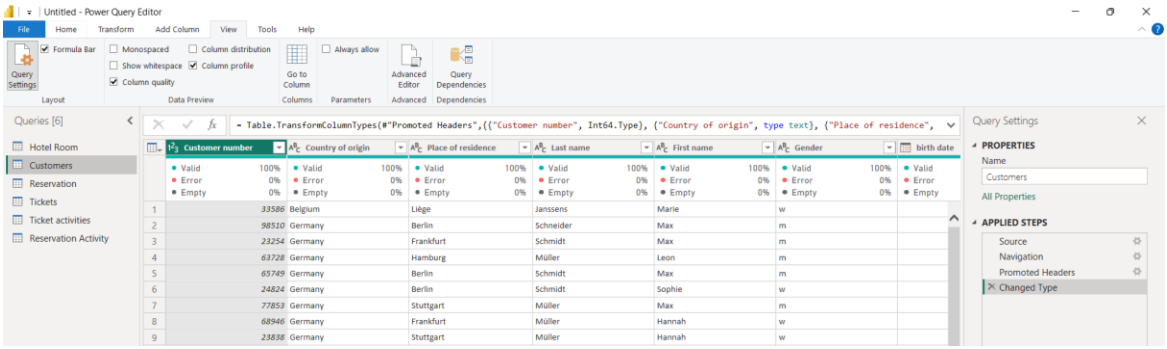
The above one is in **German** and the below on is in **English**



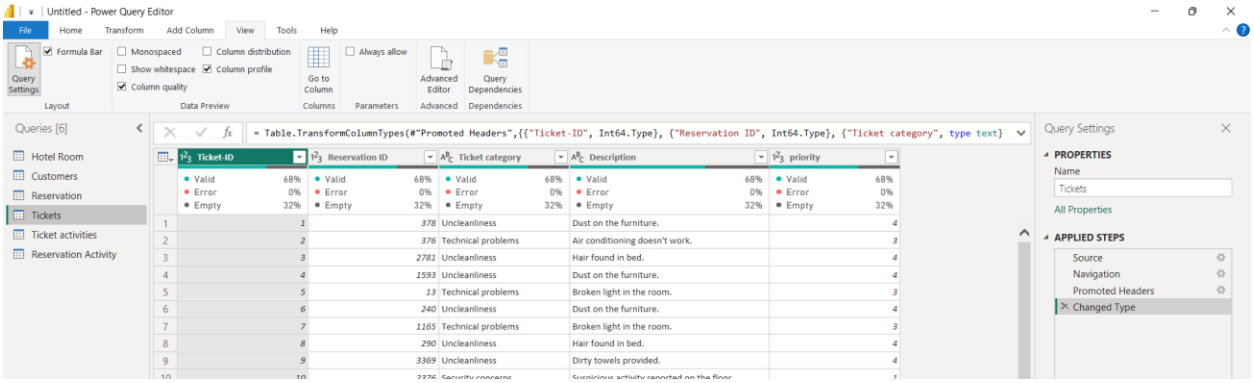
	A	B	C	D	E	F	G
1	Ticket-ID	Reservation ID	Ticket category	Description	priority		
2	00000001	00000378	Uncleanliness	Dust on the furniture.	4		
3	00000002	00000376	Technical problems	Air conditioning doesn't work.	3		
4	00000003	00002781	Uncleanliness	Hair found in bed.	4		
5	00000004	00001593	Uncleanliness	Dust on the furniture.	4		
6	00000005	00000013	Technical problems	Broken light in the room.	3		
7	00000006	00000240	Uncleanliness	Dust on the furniture.	4		
8	00000007	00001165	Technical problems	Broken light in the room.	3		
9	00000008	00000290	Uncleanliness	Hair found in bed.	4		
10	00000009	00003369	Uncleanliness	Dirty towels provided.	4		
11	00000010	00002376	Security concerns	Suspicious activity reported on the floor.	1		
12	00000011	00000370	Security concerns	Safe in room broken.	2		
13	00000012	00000662	Uncleanliness	Dust on the furniture.	4		
14	00000013	00000736	Technical problems	Air conditioning doesn't work.	3		
15	00000014	00000119	Technical problems	Broken light in the room.	3		
16	00000015	00002658	Technical problems	TV won't turn on.	3		
17	00000016	00001557	Technical problems	No WiFi available.	2		
18	00000017	00003308	Technical problems	Air conditioning doesn't work.	3		
19	00000018	00002241	Security concerns	Suspicious activity reported on the floor.	1		
20	00000019	00001989	Uncleanliness	Dirty towels provided.	4		
21	00000020	00001903	Uncleanliness	Bathroom not cleaned properly.	4		
22	00000021	00003076	Technical problems	Broken light in the room.	3		
23	00000022	00002816	Uncleanliness	Hair found in bed.	4		
24	00000023	00000024	Uncleanliness	Dust on the furniture.	4		

2. Now, I am importing the Excel workbook into Power BI and checking the data in Power Query by using Get Data → Excel Workbook → Transform Data

3. To check validity, errors, and empty values, I go to View → Column Profile and Column Quality. I found some mistakes during data translation, so I removed the empty rows and columns to clean the data



100% clean data



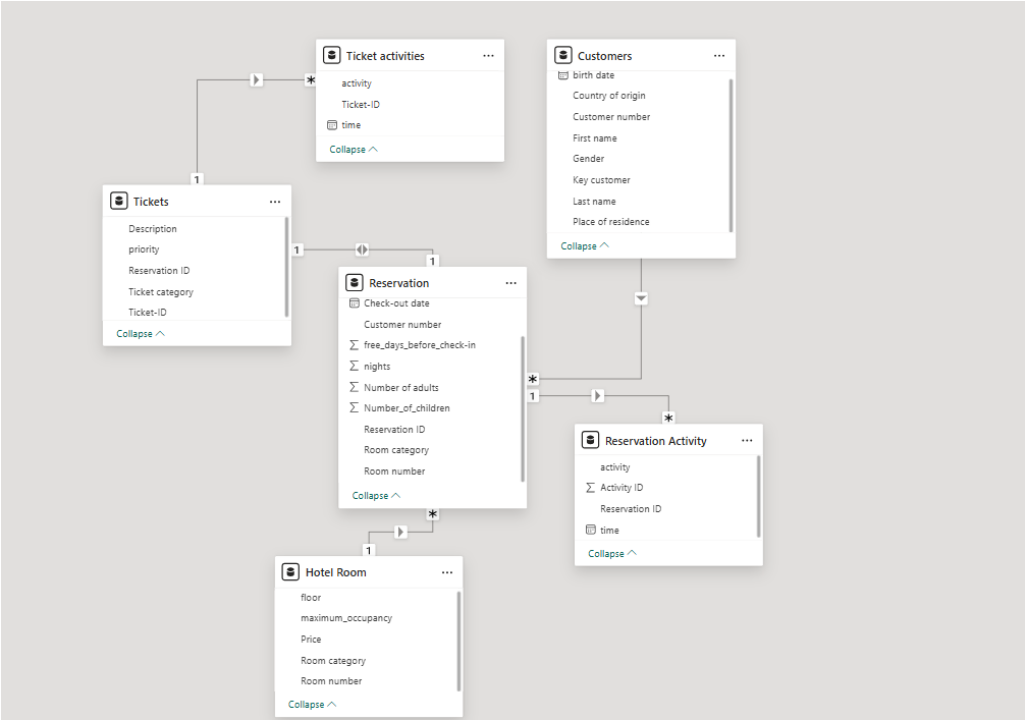
Shows 32% empty data so I remove the rows

Question 1:How can the relationships among all the tables in a dataset be identified and analyzed??

Answer:

3. Then we checked all the tables and identified which ones are dimension tables and which ones are fact tables. Tickets, Hotel Rooms, and Customers have primary keys, so they are dimension tables. Reservation, Ticket Activity, and Reservation Activity have foreign keys and contain measurable data, so they are fact tables.

4. We performed data modeling by creating relationships among the tables, including one-to-one and one-to-many relationships.

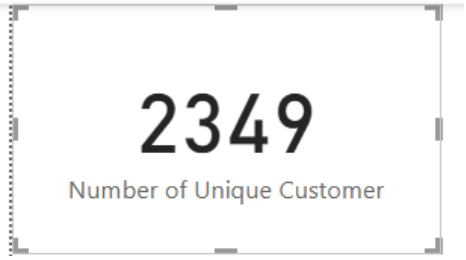


5. Now I am starting the DAX operations, which have two parts: calculated columns and measures

Question 2: How can the total number of unique customers be determined?

Answer:

6. Now I am going to find the total number of unique customers. Initially, I tried to create a calculated column named 'Unique Customers' using the formula Unique Customers = DISTINCTCOUNT(Customer[Customer number]), but actually, this is unnecessary. We can directly use Customer number with the aggregation 'Count (Distinct)' to get the number of unique customers



It shows the number of unique customers

Question 3: What steps can be taken to calculate the occupancy rate?

Answer:

7. **Occupancy Rate**

The percentage of available rooms (or seats, spaces) that are occupied over a specific period is called the occupancy rate. To calculate this, we go to the Hotel Room table and create a new measure**:**

Occupied Rooms = DISTINCTCOUNT('Hotel Room'[Room number])

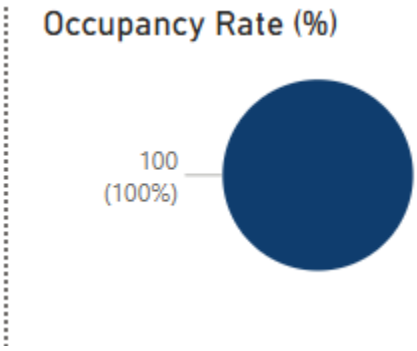
Next, we create another measure:

Total Rooms = COUNTROWS('Hotel Room')

Finally, we calculate the occupancy rate using this measure:

Occupancy Rate (%) = DIVIDE([Occupied Rooms], [Total Rooms], 0) * 100

Note: These I created as measures, not calculated columns, because they summarize data rather than create row-by-row calculations.



How can the distribution of customer complaints be analyzed room-wise?

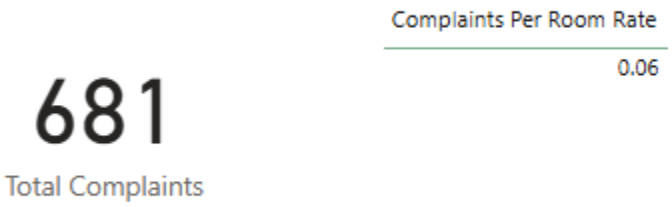
Answer:

8. To find the answer, we use the Ticket table and Reservation table. We find the Ticket category in the Tickets Table and calculate the total number of ticket categories (total complaints) using the following equation:

Total Complaints = COUNTROWS(Tickets)

Next, we calculate the total number of rooms by using the Hotel Room table. Finally, we calculate the room per complaint rate using this equation:

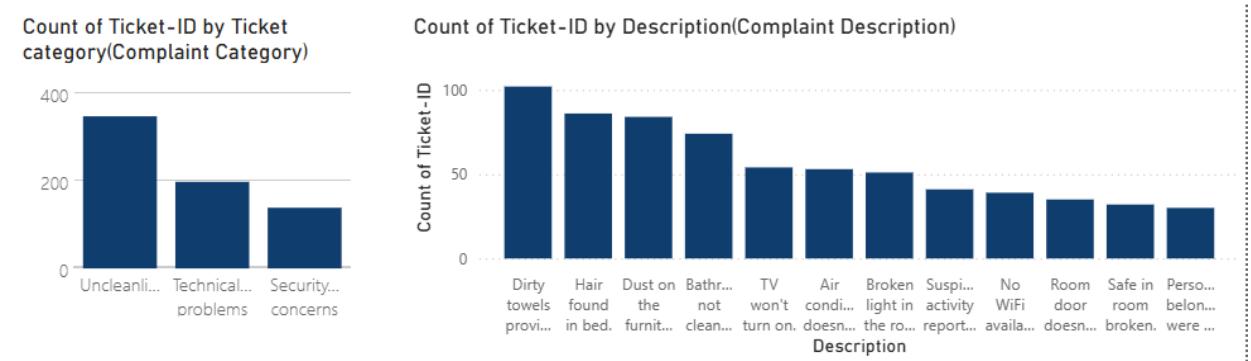
Complaints Per Room Rate = DIVIDE([Total Complaints], [Total Rooms], 0)



What are the key complaints identified in customer feedback?

Answer:

9. From the Tickets table, we can identify the complaints through the **Ticket category** column. The Ticket category has three distinct values: Uncleanliness, Technical Problems, and Security Concerns. We visualized the count of **Ticket IDs** by **Ticket category** using a **Infographic Designer**. Additionally, there are some descriptions associated with each category. To visualize the count of **Ticket IDs** per description, we created another **Clustered Bar Chart**



How can the customer retention rate be calculated?

Answer:

10. Customer retention rate is the percentage of customers who return to make repeat purchases or bookings over a specific period. We calculate this through our Reservation table. Step by step process

- **We create a column and calculate Initial Customers**

```
Initial Customers =
CALCULATE(
  DISTINCTCOUNT('Reservation'[Customer number]),
  FILTER(
    'Reservation',
    'Reservation'[Check-in date] >= DATE(2023,1,1) &&
    'Reservation'[Check-in date] < DATE(2024,1,1)
  )
)
```

- **Then we create another coloumn to calculate the** Returning Customers

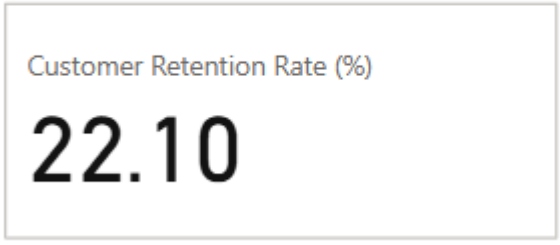
```
Returning Customers =
VAR InitialCust =
  CALCULATETABLE(
    VALUES('Reservation'[Customer number]),
```

```
        FILTER(
          'Reservation',
          'Reservation'[Check-in date] >= DATE(2023,1,1) &&
          'Reservation'[Check-in date] < DATE(2024,1,1)
        )
      )
    RETURN
    CALCULATE(
      DISTINCTCOUNT('Reservation'[Customer number]),
      FILTER(
        'Reservation',
        'Reservation'[Check-in date] >= DATE(2024,1,1) &&
        'Reservation'[Check-in date] < DATE(2025,1,1) &&
        'Reservation'[Customer number] IN InitialCust
      )
    )
```

- **Finally we calculated the Customer Retention Rate**

```
Customer Retention Rate (%) =
DIVIDE(
  [Returning Customers],
  [Initial Customers],
  0
) * 100
```

We find the rate is 22.10%



How can the total number of complaints be identified for each room?

Answer:

11. To do this, we used a Matrix visual. In the Rows field, we set Reservation[Room number], in the Columns field, we set Ticket[Ticket category], and in the Values field, we added the Count of Ticket[Ticket ID].

Room number	Security concerns	Technical problems	Uncleanliness	**Total**
101	8	8	23	**39**
102	10	13	23	**46**
103	7	14	11	**32**
104	11	10	29	**50**
105	9	8	19	**36**
106	9	10	19	**38**
201	6	12	18	**36**
Total	**138**	**197**	**346**	**681**

What is the region-wise breakdown of offers sent and customer engagement?

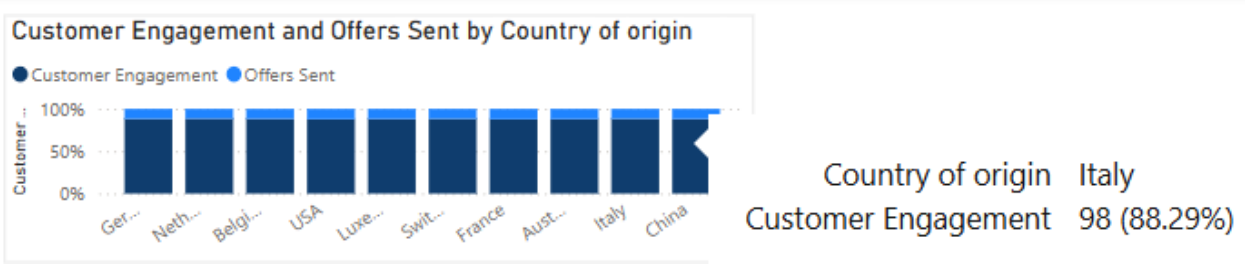
Answer:

12. Region-wise breakdown of offers sent, and customer engagement shows how many offers were sent to customers in each region and how actively customers in those regions responded or engaged with those offers. This helps identify which regions have higher offer distribution and better customer interaction. To find out more about this we do some calculations and visualizations:

I calculate: **Offers Sent = COUNTROWS(Reservation)**

Then **Customer Engagement = COUNTROWS ('Reservation Activity')**

For visualization, we used a Stacked Column Chart. We placed **Country of origin** on the **X-axis** and **Offers Sent** and **Customer Engagement** on the **Y-axis**.



How can the revenue be calculated for each room?

Answer:

13. To do this firstly I calculated Revenue Per Reservation

Revenue Per Reservation =

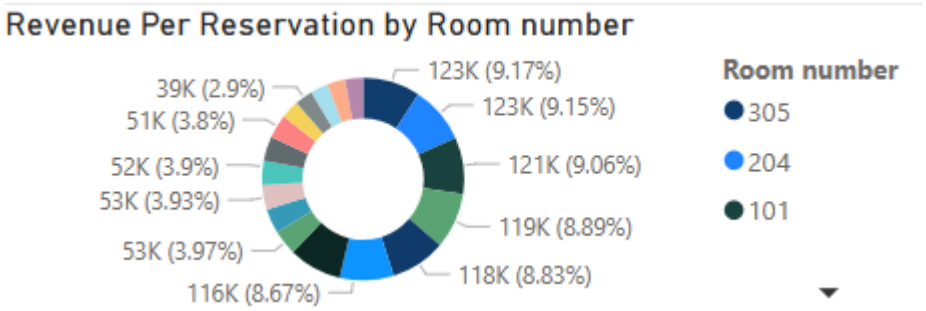
SUMX(

Reservation,

Reservation[Nights] * RELATED('Hotel Room'[Price])

)

Then to visualize this I take Room number on the axis or rows and The Revenue Per Reservation measure as the values.



13.Next we calculate the Total Booking Days using DAX measure

Total Booking Days = SUM(Reservation [Nights])

14.We calculated customers with tickets by booking channel for this I use Customers With Tickets = DISTINCTCOUNT(Ticket[Reservation ID]) and then for visualize I used bar chart .