**Measures Used for the Project as well as Visualizations**

The **Total Revenue** measure represents the total amount of money generated from all hotel bookings, based on the room rates and the number of nights stayed by guests. Here's a breakdown of the formula:

**Formula:**

Total Revenue = SUMX(HMR,HMR[AVG Daily Rate]\*(HMR[stays\_in\_week\_nights]+HMR[stays\_in\_weekend\_nights])\*[adults])

**Components:**

1. **AVG Daily Rate**: This represents the average daily rate (price per night) for a room during a guest's stay. It is typically measured in the hotel's currency (e.g., USD, EUR, etc.).
2. **stays\_in\_week\_nights + stays\_in\_weekend\_nights**:
   * **stays\_in\_week\_nights**: This represents the number of nights the guest stayed during weekdays (Monday to Friday).
   * **stays\_in\_weekend\_nights**: This represents the number of nights the guest stayed during the weekend (Saturday and Sunday).
   * Adding these two together gives the **total number of nights** the guest stayed in the hotel.
3. **adults**: This represents the number of adults in the booking. Since revenue is often tied to the number of people staying in the room, this factor is included in the calculation. In some cases, the price might vary depending on the number of guests.

**1. Average Daily Rate (ADR)**

**Formula**: AVG Daily Rate = AVERAGE(HMR[AVG Daily Rate])

**Explanation**: The **Average Daily Rate (ADR)** measures the average price per room per night. It helps track how much guests are paying on average for a room. By averaging the "AVG Daily Rate" across all bookings, this metric gives an overall view of the hotel's room pricing strategy.

* **Purpose**: ADR is used to understand the hotel’s pricing efficiency and profitability.

**2. Occupancy Rate**

**Formula**: (SUM(adults + children + babies) / Total available rooms) \* 100

**Explanation**: The **Occupancy Rate** represents the percentage of the hotel's rooms that are occupied by guests. The formula sums the number of **adults, children, and babies** (total guests) and divides it by the total available rooms in the hotel. Multiplying by 100 gives the percentage.

* **Purpose**: Occupancy rate is a key indicator of how effectively the hotel is filling its rooms and maximizing revenue.

**3. Cancellation Rate**

**Formula**: Cancellation Rate = CALCULATE(COUNT(HMR[is\_canceled]),HMR[is\_canceled] = 1)/COUNT(HMR[reservation\_status])

**Explanation**: The **Cancellation Rate** is the percentage of total reservations that were cancelled. The formula sums up the number of cancelled bookings (is\_cancelled where 1 indicates cancelled) and divides it by the total number of reservations (reservation\_status).

* **Purpose**: This metric helps the hotel understand the rate at which bookings are being cancelled, which is important for revenue forecasting and operational efficiency.

**4. Booking Lead Time**

**Formula**: AVERAGE(lead\_time)

**Explanation**: **Booking Lead Time** refers to the average number of days between the booking date and the actual arrival date. The formula takes the average of the lead\_time column, which tracks the time between when a reservation is made and when the guest checks in.

* **Purpose**: This metric helps the hotel understand guest booking behavior, particularly how far in advance people tend to book their stays, which can aid in forecasting demand and planning marketing efforts.

**5. Repeat Guest Rate**

**Formula**: SUM(is\_repeated\_guest) / COUNT(reservation\_status)

**Explanation**: The **Repeat Guest Rate** measures the percentage of bookings made by returning guests. The formula sums the is\_repeated\_guest (where 1 indicates a repeat guest) and divides it by the total number of reservations.

* **Purpose**: This metric shows guest loyalty and satisfaction. A higher repeat guest rate suggests good customer experiences and loyalty.

**6. Total Booking Changes**

**Formula**: SUM(booking\_changes)

**Explanation**: The **Total Booking Changes** counts the number of changes made to bookings, such as room type changes, date modifications, or other amendments.

* **Purpose**: This metric helps the hotel track the frequency of booking modifications, which can indicate how often guests are making adjustments to their reservations. High numbers could signal issues with the booking process or changing guest preferences.

**7. Special Requests**

**Formula**: SUM(total\_of\_special\_requests)

**Explanation**: The **Special Requests** measure sums up the total number of special requests made by guests (e.g., extra pillows, room with a view, specific amenities).

* **Purpose**: This metric gives insights into customer preferences and demands. It helps the hotel understand what additional services or amenities guests are asking for, which can improve service quality and guest satisfaction.

**3. Agent Performance Overview**

For analyzing agent performance, focus on booking volume and revenue generated by each agent. Key metrics include:

* **Total Bookings by Agent:** COUNT(reservation\_status) by agent.
* **Total Revenue by Agent:** SUM(AVG Daily Rate \* (stays\_in\_week\_nights + stays\_in\_weekend\_nights) \* adults) by agent.
* **Cancellation Rate by Agent:** SUM(is\_cancelled) / COUNT(reservation\_status) by agent.

**Visuals**:

* **Bar Chart**: Total bookings and revenue by agent.
* **Scatter Plot**: Cancellation rate vs total bookings for each agent.
* **Matrix**: Agent performance by key metrics like bookings, revenue, and cancellations.

**4. Customer Type Analysis (Family with Children, Singles, Couples, etc.)**

To analyze the customer segments, use the combination of **adults**, **children**, and **babies** columns to define customer types:

* **Family with Children:** (Measure) IF(adults > 1 AND children > 0, "Family with Children", "Other")
* **Single:** (Measure) IF(adults = 1 AND children = 0 AND babies = 0, "Single", "Other")
* **Couple:** (Measure) IF(adults = 2 AND children = 0 AND babies = 0, "Couple", "Other")

Key metrics to analyze customer types:

* **Total Bookings by Customer Type:** COUNT(reservation\_status) by customer type.
* **Total Revenue by Customer Type:** SUM(AVG Daily Rate \* (stays\_in\_week\_nights + stays\_in\_weekend\_nights)) by customer type.
* **Average Stay Duration by Customer Type:** (Measure) AVERAGE(stays\_in\_week\_nights + stays\_in\_weekend\_nights).

**Visuals**:

* **Pie Chart**: Distribution of customer types.
* **Bar Chart**: Total revenue and average stay duration by customer type.
* **Table**: Booking and revenue breakdown for different customer types.

**5. Additional Insights**

* **Market Segment Analysis**: Analyze revenue and bookings by market segment to see which segments (corporate, leisure, etc.) are driving the most business.
  + **Bar Chart**: Total revenue and bookings by market segment.
  + **Pie Chart**: Distribution of bookings by market segment.
* **Repeat Guest Analysis**:
  + **Bar Chart**: Compare revenue and bookings for repeat vs non-repeat guests.
  + **Line Chart**: Track the trend of repeat guest bookings over time.
* **Special Requests and Deposits**: Analyze how the number of special requests and deposits correlates with booking behavior, cancellations, or higher revenue.
  + **Scatter Plot**: Number of special requests vs total revenue.