



# Hotel Booking & Cancellation Analysis

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# Introduction

In the competitive hospitality industry, understanding customer behavior is vital for success. This project focuses on analyzing hotel bookings and cancellations to uncover key factors that influence guest decisions. By examining data on lead time, guest demographics, meal preferences, and booking sources, we aim to identify patterns that impact cancellation rates.

Through this analysis, we seek to provide actionable insights that can help hotel managers reduce cancellations, enhance guest satisfaction, and improve overall profitability. This report will present key findings, relevant metrics, and recommendations for better decision-making in hotel management.



# Objective



To understand the factors influencing hotel booking cancellations.



To analyze booking patterns and guest demographics.



To provide actionable insights to improve booking strategies and reduce cancellations.



# Dataset Description

hotel	Type of hotel (e.g., Resort, City Hotel)	Text
is_canceled	Indicates whether the booking was canceled (1) or not (0)	Integer
lead_time	Number of days between the booking and the arrival date	Integer
arrival_date_year	Year of arrival	Integer
arrival_date_month	Month of arrival	Text (Month Name)
arrival_date_week_number	Week number of the year	Integer
arrival_date_day_of_month	Day of the month	Integer
stays_in_weekend_nights	Number of weekend nights stayed	Integer
stays_in_week_nights	Number of week nights stayed	Integer
adults	Number of adults	Integer
children	Number of children	Integer
babies	Number of babies	Integer
meal	Meal plan (e.g., BB, HB)	Text
country	Country of origin	Text



market_segment	Market segment (e.g., Direct, Online Travel Agency)	Text
distribution_channel	Channel used to make the booking	Text
is_repeated_guest	Indicates if the guest is a repeated guest (1) or not (0)	Integer
previous_cancellations	Number of previous cancellations by the guest	Integer
previous_bookings_not_canceled	Number of previous bookings not canceled	Integer
reserved_room_type	Type of room reserved	Text
assigned_room_type	Type of room assigned	Text
booking_changes	Number of changes to the booking	Integer
reservation_status	Current status of the reservation	Text
reservation_status_date	Date of the reservation status	Date
room_status	Current status of the room	Text
guest_type	Type of guest (e.g., business, leisure)	Text
lead_time_intervals	Categorized lead time intervals (e.g., short, medium, long)	Text
Month	Month of arrival	Text (Month Name)
repeated_guest?	Indicates if the guest is a repeated guest (1) or not (0)	Integer



# Raw Dataset

hotel	is_canceled	lead_time	arrival_date	arrival_date	arrival_date	arrival_date	stays_in_week	stays_in_week	adults	children	babies	meal	country	market_segment	distribution_channel	is_repeated_guest	previous_bookings_not_canceled	pr
Resort Hotel	0	342	2015	July		27	1	0	0	2	0	0	BB	PRT	Direct	Direct	0	0
Resort Hotel	0	737	2015	July		27	1	0	0	2	0	0	BB	PRT	Direct	Direct	0	0
Resort Hotel	0	7	2015	July		27	1	0	1	1	0	0	BB	GBR	Direct	Direct	0	0
Resort Hotel	0	13	2015	July		27	1	0	1	1	0	0	BB	GBR	Corporate	Corporate	0	0
Resort Hotel	0	14	2015	July		27	1	0	2	2	0	0	BB	GBR	Online TA	TA/TO	0	0
Resort Hotel	0	14	2015	July		27	1	0	2	2	0	0	BB	GBR	Online TA	TA/TO	0	0
Resort Hotel	0	0	2015	July		27	1	0	2	2	0	0	BB	PRT	Direct	Direct	0	0
Resort Hotel	0	9	2015	July		27	1	0	2	2	0	0	FB	PRT	Direct	Direct	0	0
Resort Hotel	1	85	2015	July		27	1	0	3	2	0	0	BB	PRT	Online TA	TA/TO	0	0
Resort Hotel	1	75	2015	July		27	1	0	3	2	0	0	HB	PRT	Offline TA	TA/TO	0	0
Resort Hotel	1	23	2015	July		27	1	0	4	2	0	0	BB	PRT	Online TA	TA/TO	0	0
Resort Hotel	0	35	2015	July		27	1	0	4	2	0	0	HB	PRT	Online TA	TA/TO	0	0
Resort Hotel	0	68	2015	July		27	1	0	4	2	0	0	BB	USA	Online TA	TA/TO	0	0
Resort Hotel	0	18	2015	July		27	1	0	4	2	1	0	HB	ESP	Online TA	TA/TO	0	0
Resort Hotel	0	37	2015	July		27	1	0	4	2	0	0	BB	PRT	Online TA	TA/TO	0	0
Resort Hotel	0	68	2015	July		27	1	0	4	2	0	0	BB	IRL	Online TA	TA/TO	0	0
Resort Hotel	0	37	2015	July		27	1	0	4	2	0	0	BB	PRT	Offline TA	TA/TO	0	0
Resort Hotel	0	12	2015	July		27	1	0	1	2	0	0	BB	IRL	Online TA	TA/TO	0	0
Resort Hotel	0	0	2015	July		27	1	0	1	2	0	0	BB	FRA	Corporate	Corporate	0	0
Resort Hotel	0	7	2015	July		27	1	0	4	2	0	0	BB	GBR	Direct	Direct	0	0
Resort Hotel	0	37	2015	July		27	1	1	4	1	0	0	BB	GBR	Online TA	TA/TO	0	0
Resort Hotel	0	72	2015	July		27	1	2	4	2	0	0	BB	PRT	Direct	Direct	0	0
Resort Hotel	0	72	2015	July		27	1	2	4	2	0	0	BB	PRT	Direct	Direct	0	0



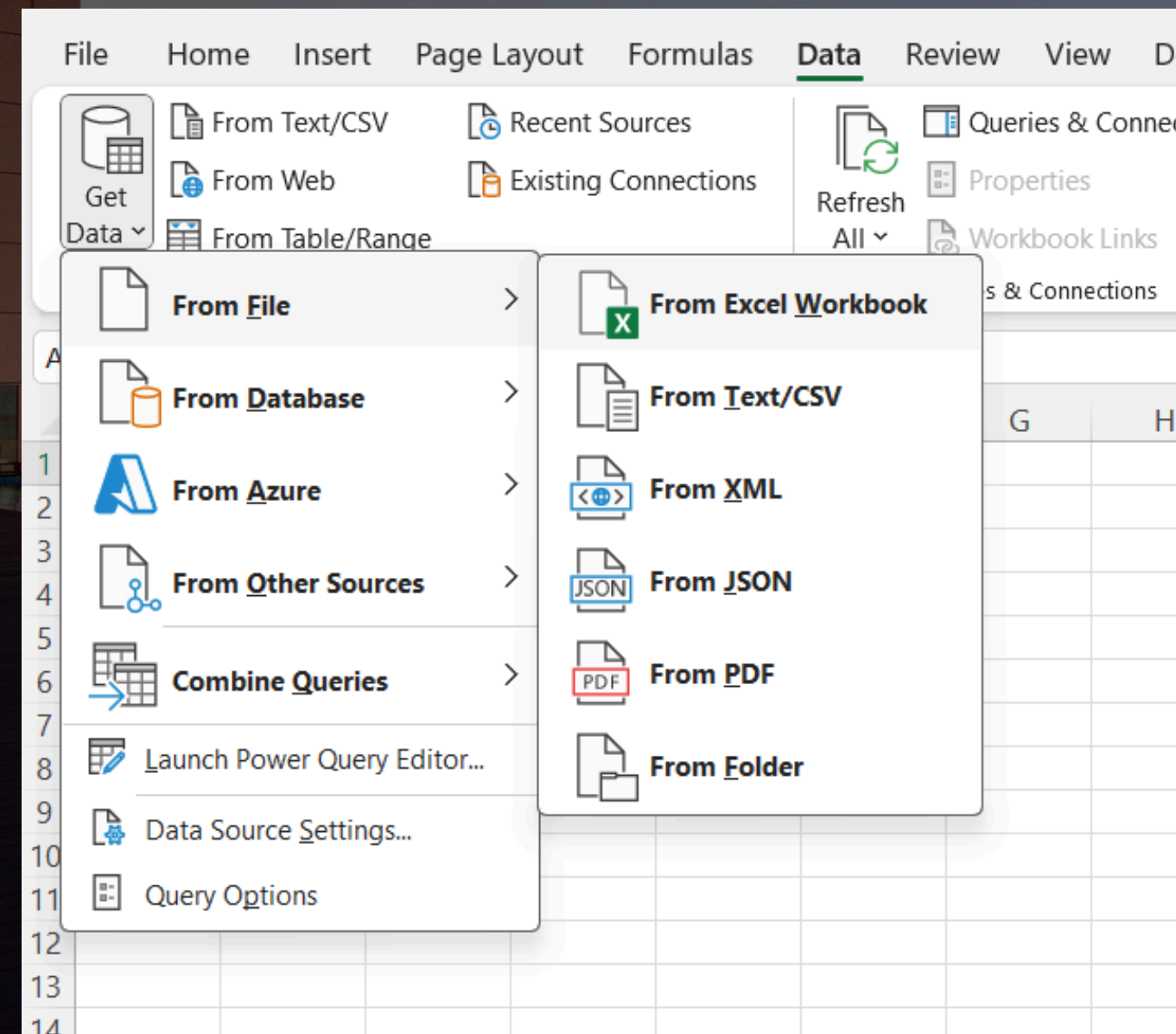
# Cleaned Dataset

hotel	is_canceled	lead_time	arrival_date_year	arrival_date_month	arrival_date_week_number	arrival_date_day_of_month	stays_in_weekend_nights	stays_in_week_nights	adults	children	babies	meal	country	m	
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
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City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2	0	2	2	0	0 Bed & Breakfast	Portugal	G
City Hotel		1	330	2016	June		23	2</							

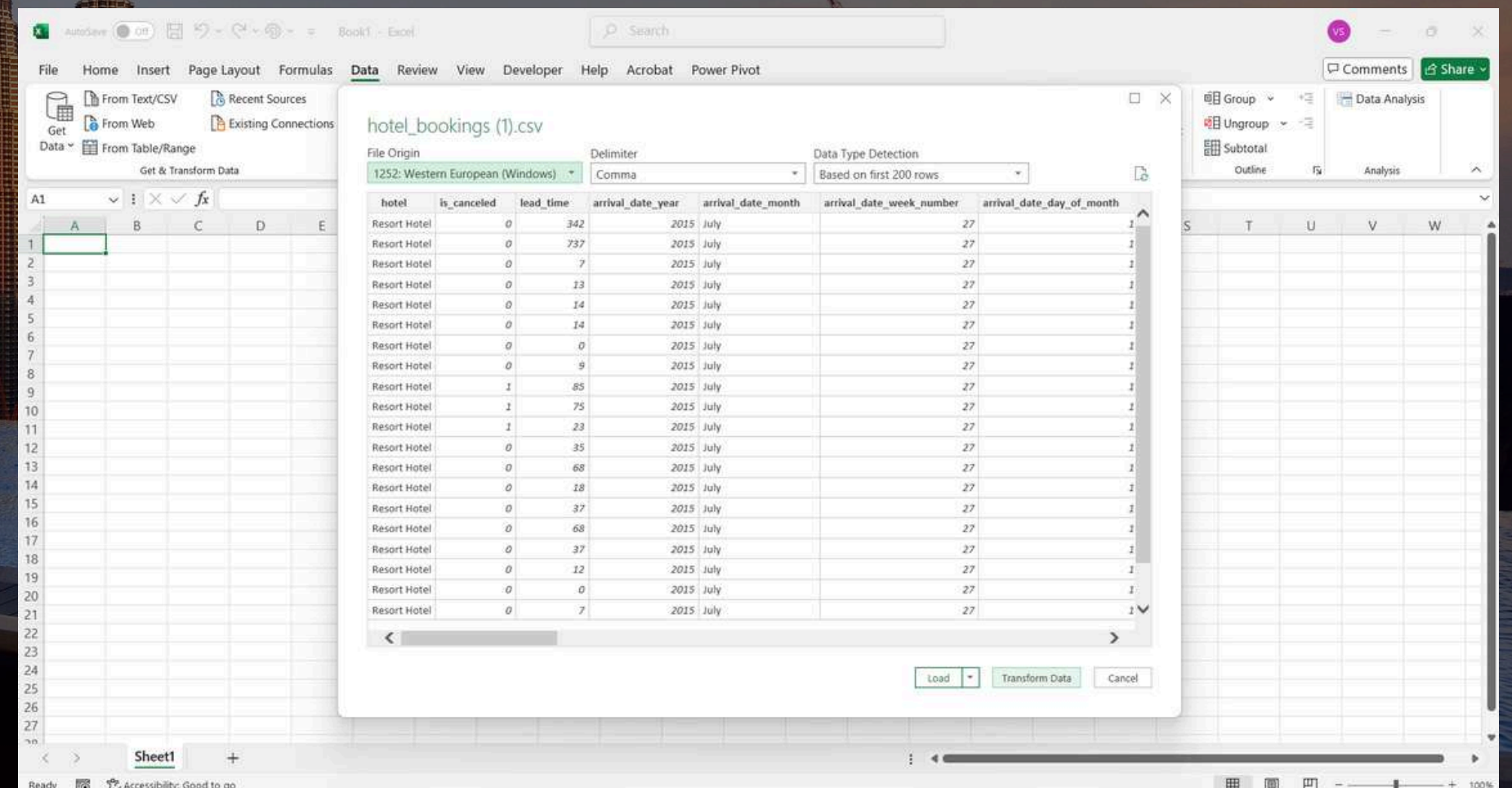


# Data Cleaning

## Step 1 - Upload Raw dataset in Power Query Editor



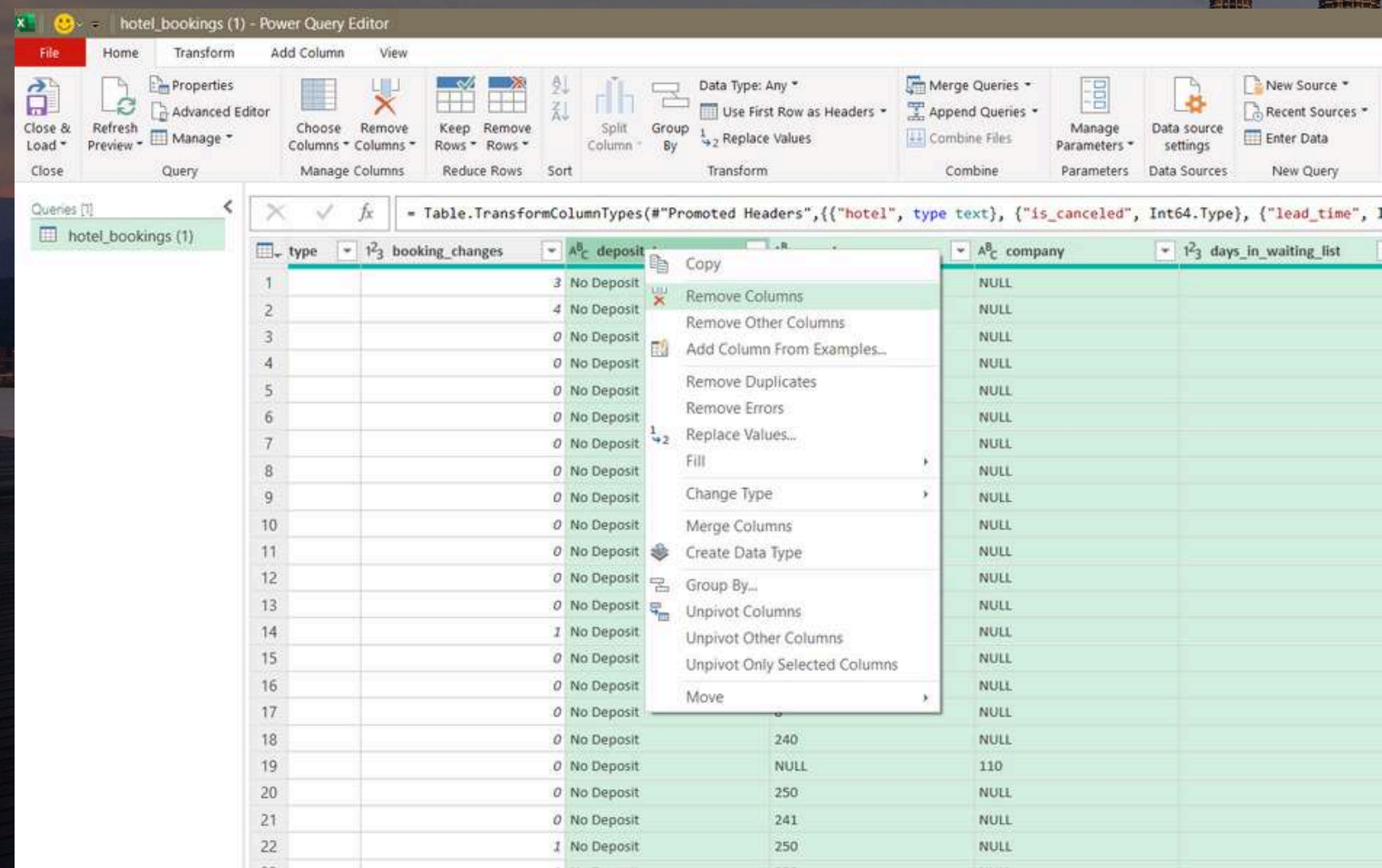
## Step 2 - Transform the Data





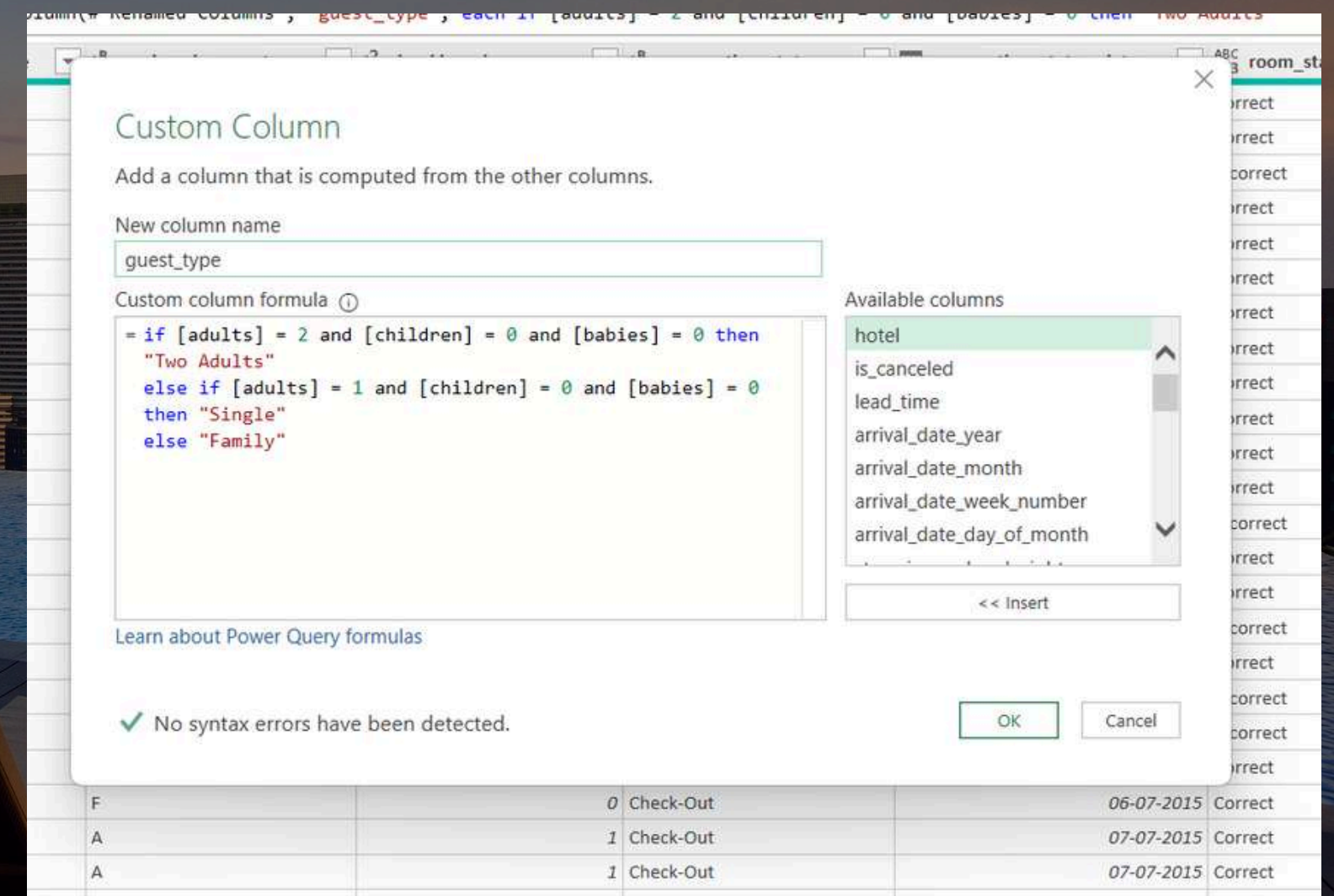
# Data Cleaning

## Step 3 - Remove unnecessary columns based on your analysis



The screenshot shows the Power Query Editor interface with a table named 'hotel\_bookings (1)'. The table has columns: type, booking\_changes, deposit, company, and days\_in\_waiting\_list. A right-click context menu is open over the 'deposit' column, showing options like 'Remove Columns', 'Remove Other Columns', 'Add Column From Examples...', 'Remove Duplicates', 'Remove Errors', 'Replace Values...', 'Fill', 'Change Type', 'Merge Columns', 'Create Data Type', 'Group By...', 'Unpivot Columns', 'Unpivot Other Columns', 'Unpivot Only Selected Columns', and 'Move'. The formula bar at the top shows a M query: `= Table.TransformColumnTypes(#"Promoted Headers",{{"hotel", type text}, {"is_canceled", Int64.Type}, {"lead_time", Int64.Type}, {"days_in_waiting_list", Int64.Type}})`.

## Step 4 - Add a custom column of 'Guest\_type'



The screenshot shows the 'Custom Column' dialog box in Power Query Editor. The 'New column name' field is set to 'guest\_type'. The 'Custom column formula' field contains the following M formula:

```
= if [adults] = 2 and [children] = 0 and [babies] = 0 then  
    "Two Adults"  
else if [adults] = 1 and [children] = 0 and [babies] = 0  
then "Single"  
else "Family"
```

The 'Available columns' list on the right includes: hotel, is\_canceled, lead\_time, arrival\_date\_year, arrival\_date\_month, arrival\_date\_week\_number, and arrival\_date\_day\_of\_month. The 'No syntax errors have been detected' message is visible at the bottom. The background shows a table with columns: F, A, 0, 1, 1, Check-Out, 06-07-2015, 07-07-2015, 07-07-2015, and Correct.



# Data Cleaning

## Step 5 - Replace Country codes with country names (Optional)



# Data Cleaning

Step 6 - Add conditional columns for 'Room status', 'Lead\_time\_intervals', 'Repeated\_guest?' and 'Assigned Rooms(Converted)'

Add Conditional Column

Add a conditional column that is computed from the other columns or values.

New column name

repeated\_guest?

Column Name	Operator	Value	Output
If is_repeated_guest	equals	ABC 123 1	Then ABC 123 Yes

Add Clause

Else

ABC 123 No

OK

Cancel

Table.AddColumn("#Removed Columns", "Custom", each if [reserved\_room\_type] = [assigned\_room\_type] then "Correct" else "Incorrect")

Add Conditional Column

Add a conditional column that is computed from the other columns or values.

New column name

Room Status

Column Name	Operator	Value	Output
If reserved_room_ty...	equals	ABC 123 assigned_room_type	Then ABC 123 Correct

Add Clause

Else

ABC 123 Incorrect

OK

Cancel

Add Conditional Column

Add a conditional column that is computed from the other columns or values.

New column name

Assigned Room

Column Name	Operator	Value	Output
If assigned_room_ty...	equals	ABC 123 A	Then ABC 123 Standard
Else If assigned_room_ty...	equals	ABC 123 B	Then ABC 123 Deluxe
Else If assigned_room_ty...	equals	ABC 123 C	Then ABC 123 Suite
Else If assigned_room_ty...	equals	ABC 123 D	Then ABC 123 Deluxe
Else If assigned_room_ty...	equals	ABC 123 E	Then ABC 123 Standard
Else If assigned_room_ty...	equals	ABC 123 F	Then ABC 123 Suite

Add Clause

Else

ABC 123 Other

OK

Cancel

Table.AddColumn("Changed Type", "Lead\_time\_intervals", each if [lead\_time] <= 30 then "0-30 Days" else if [lead\_time] <= 60 then "31-60 Days" else if [lead\_time] <= 90 then "61-90 Days" else "90+ Days")

Add Conditional Column

Add a conditional column that is computed from the other columns or values.

New column name

lead\_time\_intervals

Column Name	Operator	Value	Output
If lead_time	is less than or equ...	ABC 123 30	Then ABC 123 0-30 Days
Else If lead_time	is less than or equ...	ABC 123 60	Then ABC 123 31-60 Days
Else If lead_time	is less than or equ...	ABC 123 90	Then ABC 123 61-90 Days

Add Clause

Else

ABC 123 90+ Days

OK

Cancel



# Recommended Analysis Questions

Ques 1: What is the relationship between lead\_time and cancellations?

Ques 2: Are there any seasonal patterns in bookings and cancellations by month and year?

Ques 3: How often do guests get reassigned to a room type different from the one originally reserved, and how do booking changes affect this?

Ques 4: Which market segments bring the most bookings and cancellations?

Ques 5: Are repeat guests less likely to cancel their bookings compared to first-time guests?

Ques 6: Does the type of meal plan booked affect the likelihood of cancellations?

Ques 7: Do cancellation rates vary significantly by guest country?

Ques 8: How do different guest types (e.g., business, leisure) affect booking cancellations?

## DAX MEASURES

1. Total Bookings
2. Total Cancellations
3. Total Guests
4. Average Lead Time
5. Cancellation Rate (%)
6. Average Stay Duration
7. Repeated Guest Percentage
8. Booking Change Rate (%)



# Hotel Booking & Cancellation Analysis Dashboard





# Conclusion

This analysis offers valuable insights into booking and cancellation patterns, equipping the hotel with data-driven strategies to enhance both guest experience and operational efficiency. By understanding the relationships between lead time, seasonal trends, guest demographics, and booking behaviors, the hotel can tailor its offerings, improve resource allocation, and reduce cancellation rates. Focused initiatives, such as strengthening loyalty programs for repeat guests, refining meal and room options, and implementing region-specific strategies, will help increase booking retention and optimize revenue. Overall, these insights lay the foundation for more informed decision-making, fostering a sustainable and customer-centric approach to hotel management.



A wide-angle photograph of a rooftop infinity pool at dusk. The pool's edge is in the foreground, with several lounge chairs and a metal ladder visible. The water reflects the city lights. In the background, a dense urban skyline is visible under a twilight sky, with the Petronas Towers prominently centered. A semi-transparent dark brown rectangle is overlaid on the image, containing the text 'THANK YOU!!!'.

**THANK YOU!!!**