

# **Data and Artificial Intelligence**

## **Cyber Shujaa Program**

### **Week 4 Assignment**

### **Business intelligence using power Bi**

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## Introduction

This week's assignment was to develop hands-on experience in Business Intelligence using Power BI for Hotel Management and publishing my work on the cloud. I had never interacted with power BI before. Power BI is a business analytics service by Microsoft that helps users connect to, visualize, and analyse data to gain actionable insights. It is a unified platform for business intelligence that uses interactive dashboards, reports, and visualizations to make data easier to understand.

## Objectives

The purpose of the assignment is to gain hands-on practice:

1. Understand the Hotel business and client needs
2. Load Data
3. Transform Data
4. Build DAX
5. Visualize Dashboard
6. Publish your project as part of your portfolio collection

## Tasks Completed

### Step 1: load and transform the various data set

I loaded and transformed the dim\_date data set. I deleted the mmm yyy column because its values had included the days of the week instead of just month and year. I added a new column with the DAX expression; `FORMAT(dim_date[date], "MMM yyyy")` . all the values in the column were transformed to month and year. I also transformed the date\_type column to format Friday and saturday as the weekend and the rest as weekdays. This was achieved through the following DAX expression: `day_type =`

`IF(`

`WEEKDAY(dim_date[date], 2) IN {5, 6},`

`"Weekend",`

"Weekday"

)

## Screenshots

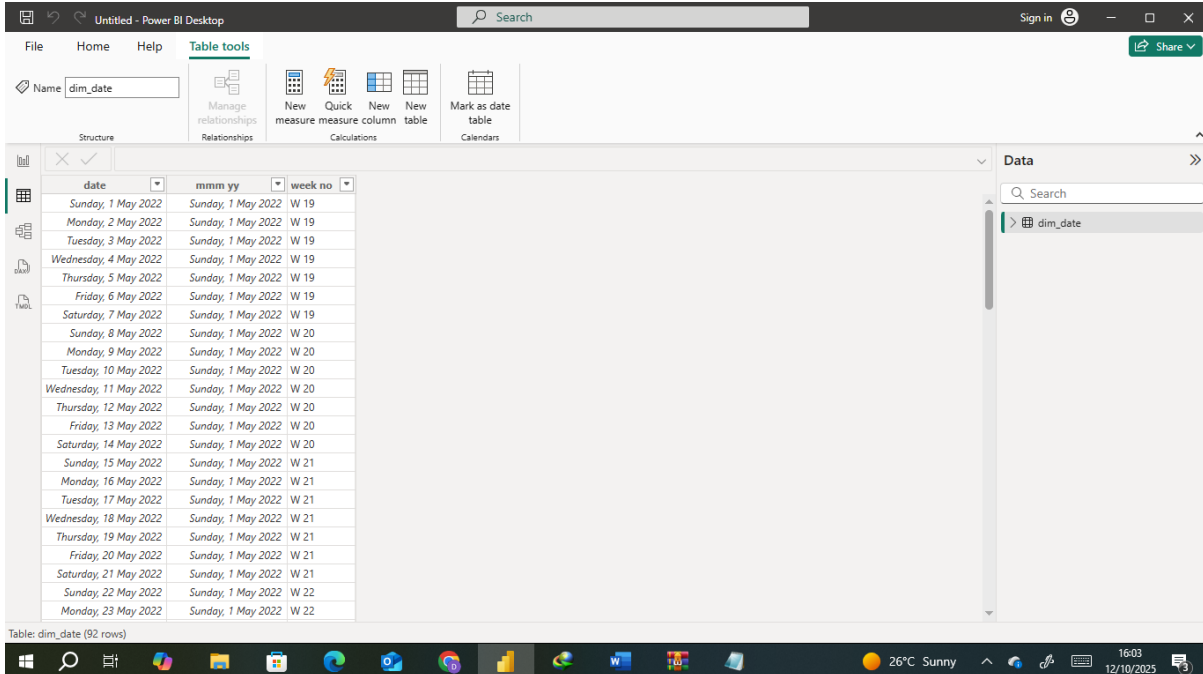


Table: dim\_date (92 rows)

date	mmm yy	week no
Sunday, 1 May 2022	Sunday, 1 May 2022	W 19
Monday, 2 May 2022	Sunday, 1 May 2022	W 19
Tuesday, 3 May 2022	Sunday, 1 May 2022	W 19
Wednesday, 4 May 2022	Sunday, 1 May 2022	W 19
Thursday, 5 May 2022	Sunday, 1 May 2022	W 19
Friday, 6 May 2022	Sunday, 1 May 2022	W 19
Saturday, 7 May 2022	Sunday, 1 May 2022	W 19
Sunday, 8 May 2022	Sunday, 1 May 2022	W 20
Monday, 9 May 2022	Sunday, 1 May 2022	W 20
Tuesday, 10 May 2022	Sunday, 1 May 2022	W 20
Wednesday, 11 May 2022	Sunday, 1 May 2022	W 20
Thursday, 12 May 2022	Sunday, 1 May 2022	W 20
Friday, 13 May 2022	Sunday, 1 May 2022	W 20
Saturday, 14 May 2022	Sunday, 1 May 2022	W 20
Sunday, 15 May 2022	Sunday, 1 May 2022	W 21
Monday, 16 May 2022	Sunday, 1 May 2022	W 21
Tuesday, 17 May 2022	Sunday, 1 May 2022	W 21
Wednesday, 18 May 2022	Sunday, 1 May 2022	W 21
Thursday, 19 May 2022	Sunday, 1 May 2022	W 21
Friday, 20 May 2022	Sunday, 1 May 2022	W 21
Saturday, 21 May 2022	Sunday, 1 May 2022	W 21
Sunday, 22 May 2022	Sunday, 1 May 2022	W 22
Monday, 23 May 2022	Sunday, 1 May 2022	W 22

Figure 1: screenshot showing the day\_type column removed

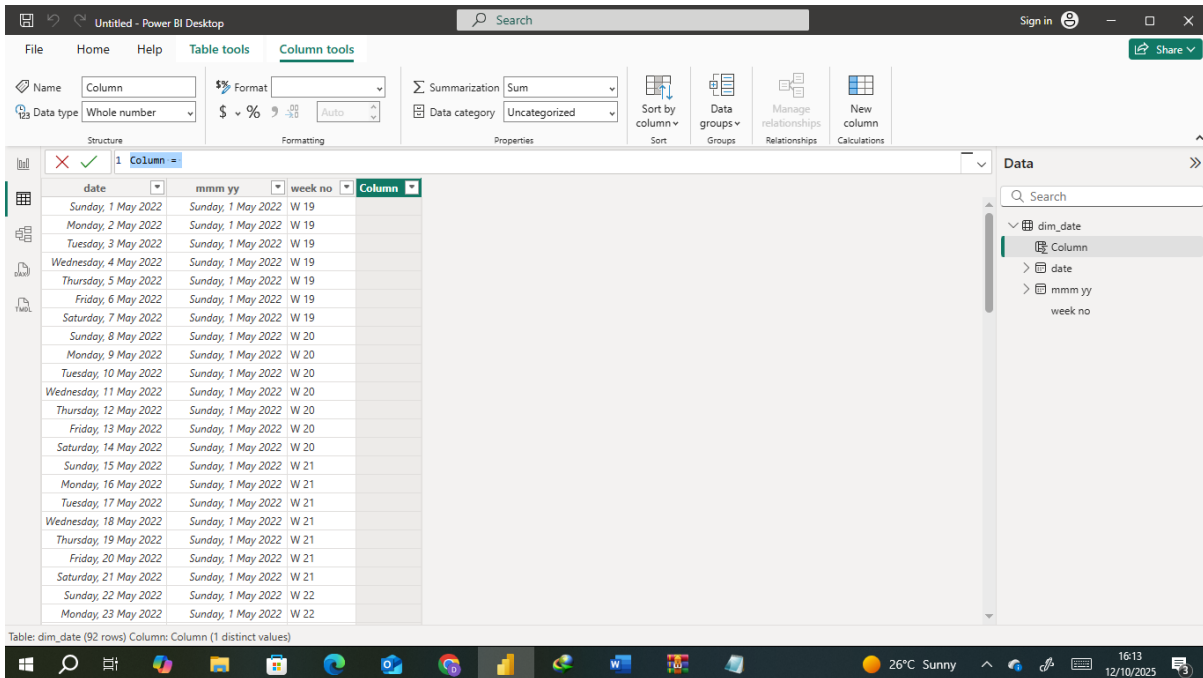
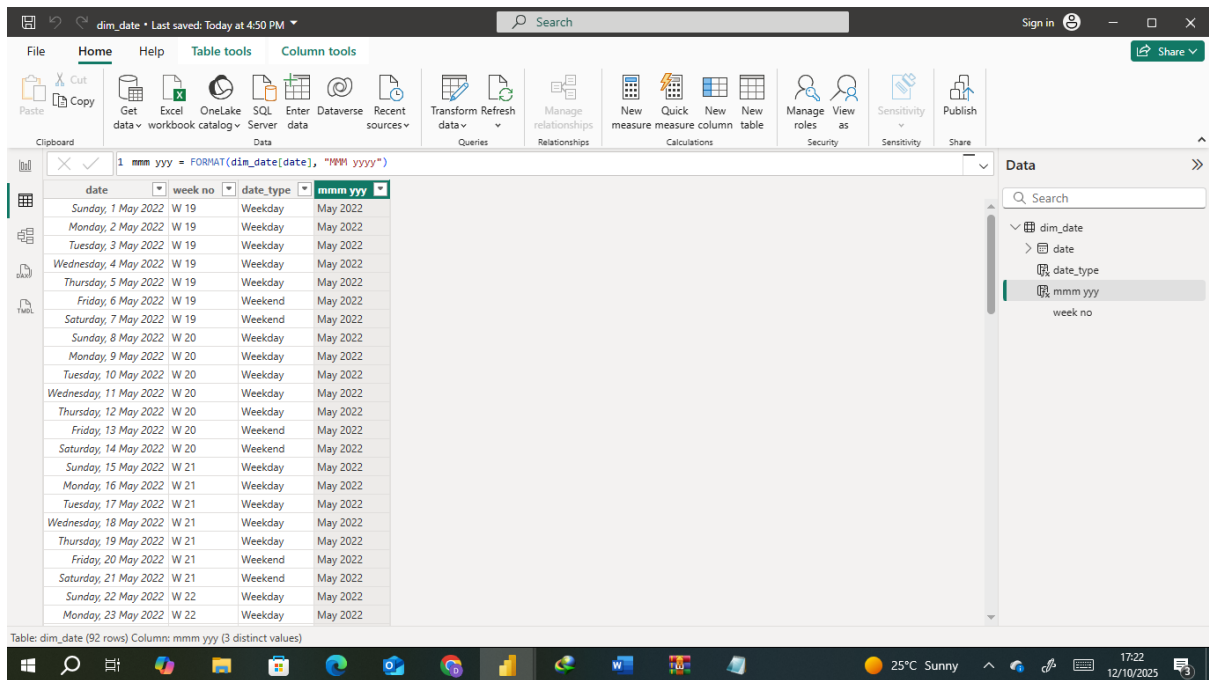


Table: dim\_date (92 rows) Column: Column (1 distinct values)

date	mmm yy	week no	Column
Sunday, 1 May 2022	Sunday, 1 May 2022	W 19	
Monday, 2 May 2022	Sunday, 1 May 2022	W 19	
Tuesday, 3 May 2022	Sunday, 1 May 2022	W 19	
Wednesday, 4 May 2022	Sunday, 1 May 2022	W 19	
Thursday, 5 May 2022	Sunday, 1 May 2022	W 19	
Friday, 6 May 2022	Sunday, 1 May 2022	W 19	
Saturday, 7 May 2022	Sunday, 1 May 2022	W 19	
Sunday, 8 May 2022	Sunday, 1 May 2022	W 20	
Monday, 9 May 2022	Sunday, 1 May 2022	W 20	
Tuesday, 10 May 2022	Sunday, 1 May 2022	W 20	
Wednesday, 11 May 2022	Sunday, 1 May 2022	W 20	
Thursday, 12 May 2022	Sunday, 1 May 2022	W 20	
Friday, 13 May 2022	Sunday, 1 May 2022	W 20	
Saturday, 14 May 2022	Sunday, 1 May 2022	W 20	
Sunday, 15 May 2022	Sunday, 1 May 2022	W 21	
Monday, 16 May 2022	Sunday, 1 May 2022	W 21	
Tuesday, 17 May 2022	Sunday, 1 May 2022	W 21	
Wednesday, 18 May 2022	Sunday, 1 May 2022	W 21	
Thursday, 19 May 2022	Sunday, 1 May 2022	W 21	
Friday, 20 May 2022	Sunday, 1 May 2022	W 21	
Saturday, 21 May 2022	Sunday, 1 May 2022	W 21	
Sunday, 22 May 2022	Sunday, 1 May 2022	W 22	
Monday, 23 May 2022	Sunday, 1 May 2022	W 22	

Figure 2: screenshot showing the data set with an added calculated column



dim\_date • Last saved: Today at 4:50 PM

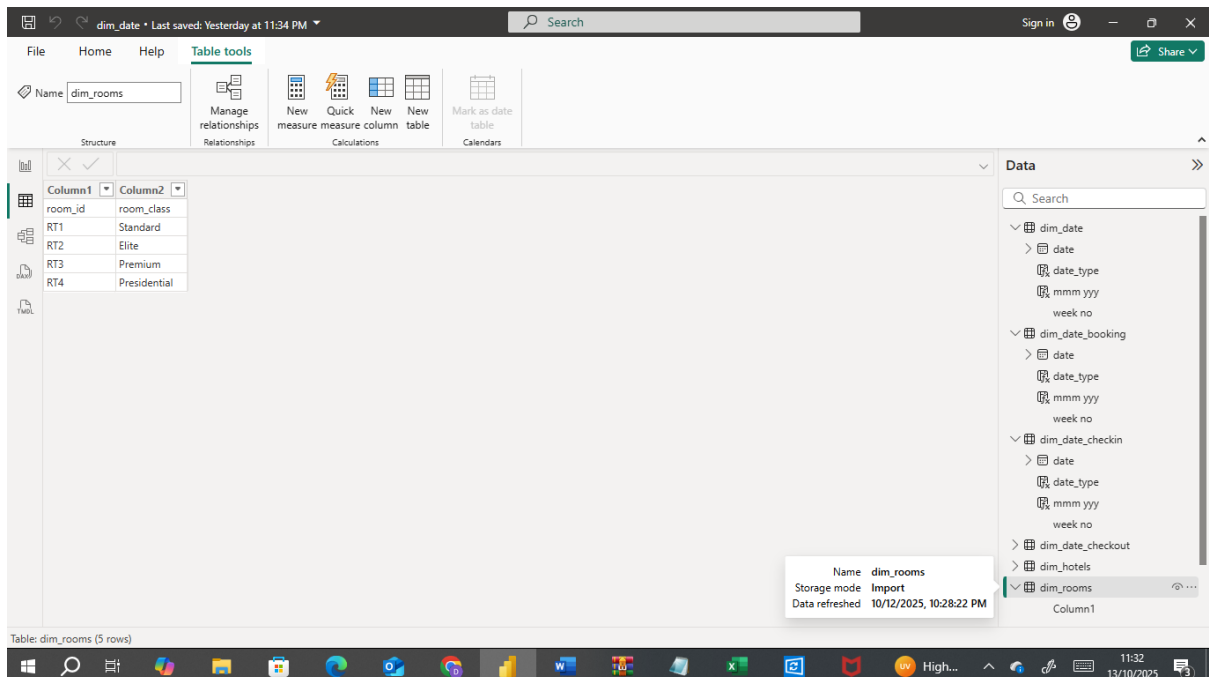
1 mmm yyyy = FORMAT(dim\_date[date], "mmm yyyy")

date	week no	date_type	mmm yyyy
Sunday, 1 May 2022	W 19	Weekday	May 2022
Monday, 2 May 2022	W 19	Weekday	May 2022
Tuesday, 3 May 2022	W 19	Weekday	May 2022
Wednesday, 4 May 2022	W 19	Weekday	May 2022
Thursday, 5 May 2022	W 19	Weekday	May 2022
Friday, 6 May 2022	W 19	Weekend	May 2022
Saturday, 7 May 2022	W 19	Weekend	May 2022
Sunday, 8 May 2022	W 20	Weekday	May 2022
Monday, 9 May 2022	W 20	Weekday	May 2022
Tuesday, 10 May 2022	W 20	Weekday	May 2022
Wednesday, 11 May 2022	W 20	Weekday	May 2022
Thursday, 12 May 2022	W 20	Weekday	May 2022
Friday, 13 May 2022	W 20	Weekend	May 2022
Saturday, 14 May 2022	W 20	Weekend	May 2022
Sunday, 15 May 2022	W 21	Weekday	May 2022
Monday, 16 May 2022	W 21	Weekday	May 2022
Tuesday, 17 May 2022	W 21	Weekday	May 2022
Wednesday, 18 May 2022	W 21	Weekday	May 2022
Thursday, 19 May 2022	W 21	Weekday	May 2022
Friday, 20 May 2022	W 21	Weekend	May 2022
Saturday, 21 May 2022	W 21	Weekend	May 2022
Sunday, 22 May 2022	W 22	Weekday	May 2022
Monday, 23 May 2022	W 22	Weekday	May 2022

Table: dim\_date (92 rows) Column: mmm yyyy (3 distinct values)

Figure 3: screenshot showing a fully transformed dataset

For the table dim\_room, Power Bi did not automatically detect the first row as headers.



dim\_date • Last saved: Yesterday at 11:34 PM

Name: dim\_rooms

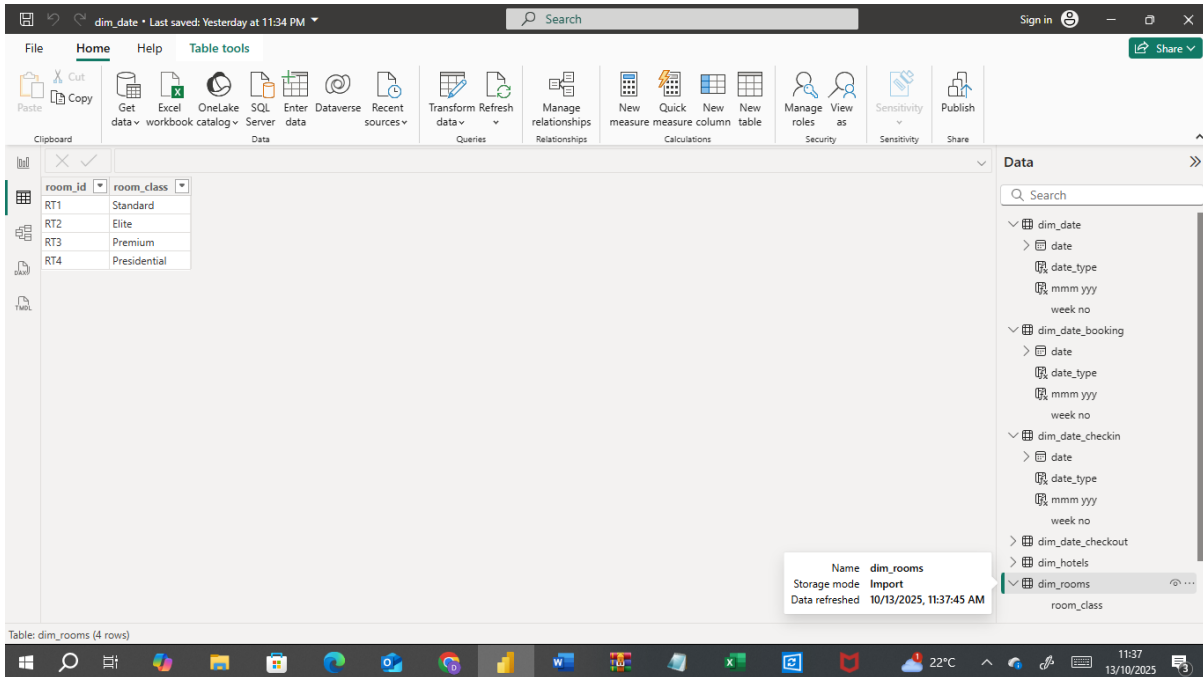
Column1	Column2
room_id	room_class
RT1	Standard
RT2	Elite
RT3	Premium
RT4	Presidential

Table: dim\_rooms (5 rows)

Name: dim\_rooms  
 Storage mode: Import  
 Data refreshed: 10/12/2025, 10:28:22 PM

Figure 4: dim\_room table before transformation

I transformed the data by opening the power query and promoted the first row to be the header. This was the result:



The screenshot shows the Microsoft Power BI Desktop interface. The main view displays a table named 'dim\_rooms' with 4 rows. The table has two columns: 'room\_id' and 'room\_class'. The data is as follows:

room_id	room_class
RT1	Standard
RT2	Elite
RT3	Premium
RT4	Presidential

The right-hand pane shows the 'Data' view with a search bar and a list of tables. The 'dim\_rooms' table is selected, and its columns are visible. A tooltip for the 'dim\_rooms' table is shown, indicating the storage mode is 'Import' and the data was refreshed on 10/13/2025 at 11:37:45 AM.

Figure 5: *dim\_room* with updated headers

## Step 2: Build the Data Model

in this step I created the date-fact relationship. I connected the date in *dim\_date* booking to booking date column in *fact\_bookings*. Property\_id was connected to property id in *fact\_aggregated bookings* and *fact\_bookings*. Cardinality was one to many.

Screenshot:

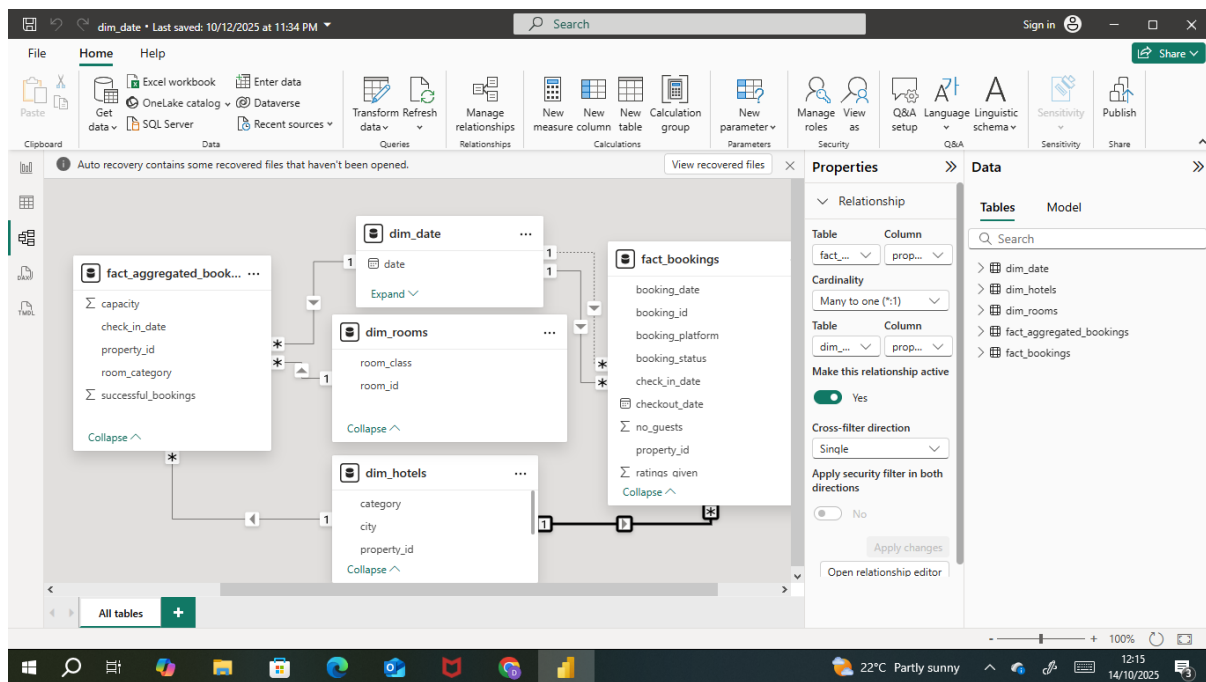


Figure 6: data model showing star schema relationship

### Step 3: Data Analysis Expressions

In this step I created a measures table, and added new measures. I inserted the following DAX expressions:

1. Revenue = SUM(fact\_bookings[revenue\_realized])
2. Total Bookings = COUNT(fact\_bookings[booking\_id])
3. Total Capacity = SUM(fact\_aggregated\_bookings[capacity])
4. Total Successful Bookings = SUM(fact\_aggregated\_bookings[successful\_bookings])
5. Occupancy % = DIVIDE([Total Successful Bookings],[Total Capacity],0)
6. Average Rating = AVERAGE(fact\_bookings[ratings\_given])
7. No of days = DATEDIFF(MIN(dim\_date[date]),MAX(dim\_date[date]),DAY) +1
8. Total cancelled bookings = CALCULATE([Total Bookings],fact\_bookings[booking\_status]="Cancelled")
9. Cancellation % = DIVIDE([Total cancelled bookings],[Total Bookings])
10. Total Checked Out = CALCULATE([Total Bookings],fact\_bookings[booking\_status]="Checked Out")
11. Total no show bookings = CALCULATE([Total Bookings],fact\_bookings[booking\_status]="No Show")



12. No Show rate % =  $\text{DIVIDE}([\text{Total no show bookings}], [\text{Total Bookings}])$
13. Booking % by Platform =  $\text{DIVIDE}([\text{Total Bookings}],$   
 $\text{CALCULATE}([\text{Total Bookings}],$   
 $\text{ALL}(\text{fact\_bookings}[\text{booking\_platform}])$   
 $))*100$
14. Booking % by Room class =  $\text{DIVIDE}([\text{Total Bookings}],$   
 $\text{CALCULATE}([\text{Total Bookings}],$   
 $\text{ALL}(\text{dim\_rooms}[\text{room\_class}])$   
 $))*100$
15. ADR =  $\text{DIVIDE}([\text{Revenue}], [\text{Total Bookings}], 0)$
16. Realisation % =  $1 - ([\text{Cancellation \%}] + [\text{No Show rate \%}])$
17. RevPAR =  $\text{DIVIDE}([\text{Revenue}], [\text{Total Capacity}])$
18. DBRN =  $\text{DIVIDE}([\text{Total Bookings}], [\text{No of days}])$
19. DSRN =  $\text{DIVIDE}([\text{Total Capacity}], [\text{No of days}])$
20. DURN =  $\text{DIVIDE}([\text{Total Checked Out}], [\text{No of days}])$
21. Revenue WoW change % =  
 $\text{Var selv} =$   
 $\text{IF}(\text{HASONEFILTER}(\text{dim\_date}[\text{wn}]), \text{SELECTEDVALUE}(\text{dim\_date}[\text{wn}], \text{MAX}(\text{dim\_date}[\text{wn}]))$   
 $\text{var revcw} = \text{CALCULATE}([\text{Revenue}], \text{dim\_date}[\text{wn}] = \text{selv})$   
 $\text{var revpw} = \text{CALCULATE}([\text{Revenue}], \text{FILTER}(\text{ALL}(\text{dim\_date}), \text{dim\_date}[\text{wn}] =$   
 $\text{selv}-1))$   
 $\text{return}$   
 $\text{DIVIDE}(\text{revcw}, \text{revpw}, 0) - 1$
22. ADR WoW change % =  
 $\text{Var selv} =$   
 $\text{IF}(\text{HASONEFILTER}(\text{dim\_date}[\text{wn}]), \text{SELECTEDVALUE}(\text{dim\_date}[\text{wn}], \text{MAX}(\text{dim\_date}[\text{wn}]))$   
 $\text{var revcw} = \text{CALCULATE}([\text{ADR}], \text{dim\_date}[\text{wn}] = \text{selv})$   
 $\text{var revpw} = \text{CALCULATE}([\text{ADR}], \text{FILTER}(\text{ALL}(\text{dim\_date}), \text{dim\_date}[\text{wn}] = \text{selv}-1))$

return

DIVIDE(revcw,revpw,0)-1

### 23. Revpar WoW change % =

Var selv =

IF(HASONEFILTER(dim\_date[wn]),SELECTEDVALUE(dim\_date[wn]),MAX(dim\_date[wn]))

var revcw = CALCULATE([RevPAR],dim\_date[wn]= selv)

var revpw = CALCULATE([RevPAR],FILTER(ALL(dim\_date),dim\_date[wn]= selv-1))

return

DIVIDE(revcw,revpw,0)-1

### 24. Realisation WoW change % =

Var selv =

IF(HASONEFILTER(dim\_date[wn]),SELECTEDVALUE(dim\_date[wn]),MAX(dim\_date[wn]))

var revcw = CALCULATE([Realisation %],dim\_date[wn]= selv)

var revpw = CALCULATE([Realisation %],FILTER(ALL(dim\_date),dim\_date[wn]= selv-1))

return

DIVIDE(revcw,revpw,0)-1

### 25. DSRN WoW change % =

Var selv =

IF(HASONEFILTER(dim\_date[wn]),SELECTEDVALUE(dim\_date[wn]),MAX(dim

```

_date[wn]))
var revcw = CALCULATE([DSRN],dim_date[wn]= selv)
var revpw = CALCULATE([DSRN],FILTER(ALL(dim_date),dim_date[wn]= selv-
1))

return

```

DIVIDE(revcw,revpw,0)-1

## Step 4: dashboard

In this step I created an interactive dashboard in the report view

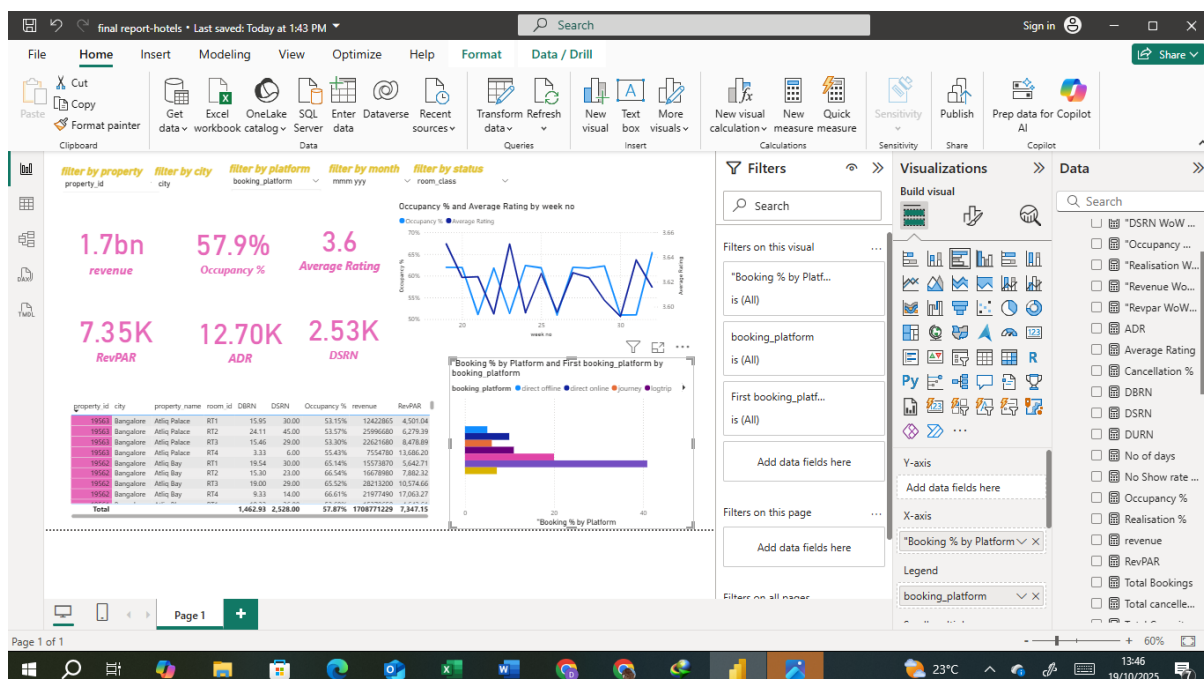


Figure 7: screenshot showing the created dashboard

### **Link to code**

#### **Link to Code:**

<https://drive.google.com/drive/folders/1PPem3NkpDq6RPFhnyOGvdKReFmKt1nKd?usp=s>  
haring

### **Conclusion**

This week's project has helped me interact with Power BI. It is a really helpful tool in data visualization. It provides a clear and concise way to communicate complex data, improves efficiency, and enables interactive exploration of insights.