AtliQ Hotels Data Analysis Project

In [7]:
```
import pandas as pd
```

==> 1. Data Import and Data Exploration

Datasets

We have 5 csv file

- dim_date.csv
- dim_hotels.csv
- dim_rooms.csv
- fact_aggregated_bookings
- fact_bookings.csv

Read bookings data in a datagrame

In [8]:
```
df_bookings = pd.read_csv('datasets/fact_bookings.csv')
```

Explore bookings data

In [10]:
```
df_bookings.head()
```

Out[10]:

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
0	May012216558RT11	16558.0	27-04-22	1/5/2022	2/5/2022	-3.0
1	May012216558RT12	16558.0	30-04-22	1/5/2022	2/5/2022	2.0
2	May012216558RT13	16558.0	28-04-22	1/5/2022	4/5/2022	2.0
3	May012216558RT14	16558.0	28-04-22	1/5/2022	2/5/2022	-2.0
4	May012216558RT15	16558.0	27-04-22	1/5/2022	2/5/2022	4.0

In [11]:
```
df_bookings.shape
```

Out[11]:
```
(11492, 12)
```

In [12]:
```
df_bookings.room_category.unique()
```

Out[12]:
```
array(['RT1', 'RT2', 'RT3', 'RT4', nan], dtype=object)
```

```
In [13]: df_bookings.booking_platform.unique()
```

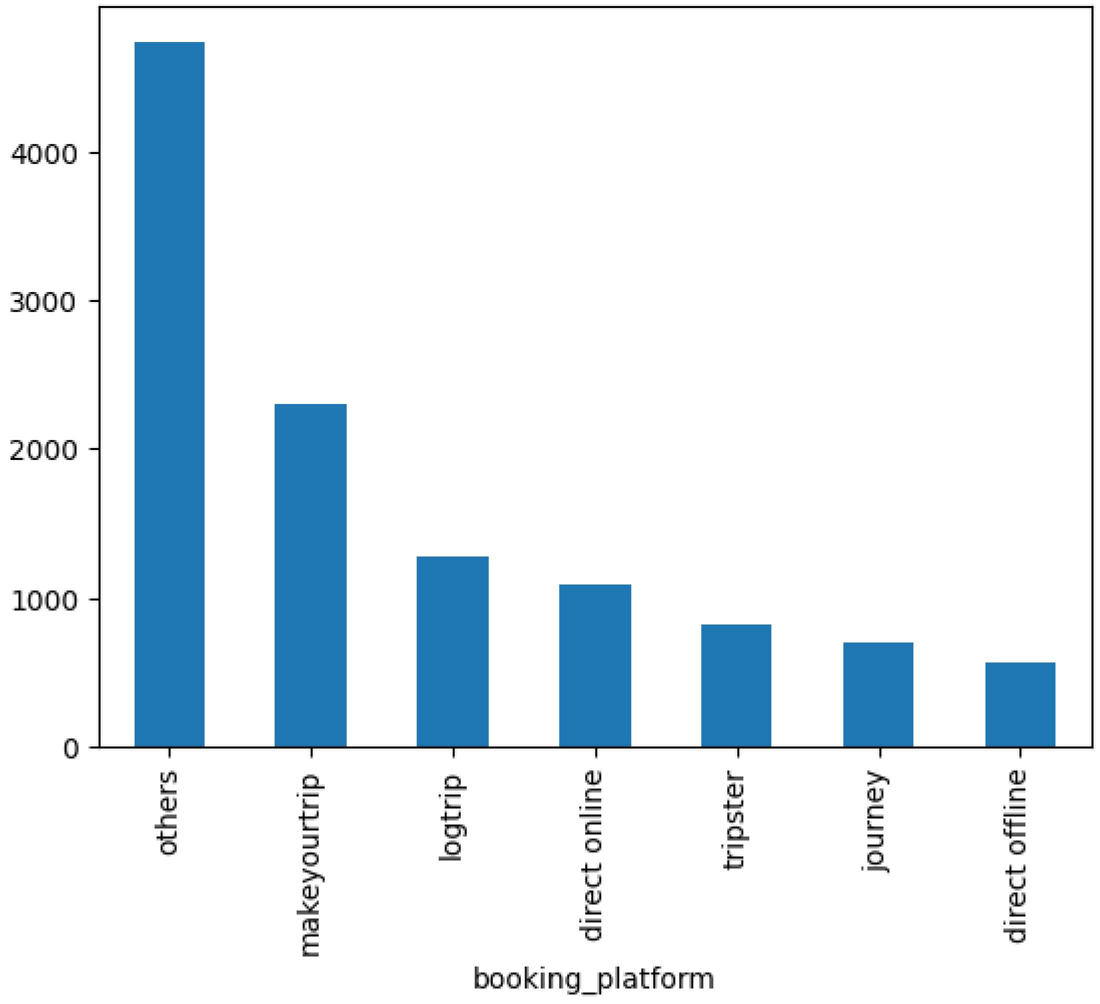
```
Out[13]: array(['direct online', 'others', 'logtrip', 'tripster', 'makeyourtrip',
                'journey', 'direct offline', nan], dtype=object)
```

```
In [14]: df_bookings.booking_platform.value_counts()
```

```
Out[14]: booking_platform
         others            4732
         makeyourtrip      2299
         logtrip           1275
         direct online     1092
         tripster           820
         journey            701
         direct offline     572
         Name: count, dtype: int64
```

```
In [15]: df_bookings.booking_platform.value_counts().plot(kind="bar")
```

```
Out[15]: <Axes: xlabel='booking_platform'>
```



```
In [16]: df_bookings.describe()
```

Out[16]:

	property_id	no_guests	ratings_given	revenue_generated	revenue_realized
count	11491.000000	11488.000000	4797.000000	1.149100e+04	11491.000000
mean	17999.889914	2.028552	3.658537	1.944373e+04	12623.126099
std	1110.247385	1.024495	1.235988	3.037232e+05	6883.241393
min	16558.000000	-3.000000	1.000000	6.500000e+03	2600.000000
25%	16563.000000	1.000000	3.000000	9.900000e+03	7600.000000
50%	17564.000000	2.000000	4.000000	1.350000e+04	11400.000000
75%	18563.000000	2.000000	5.000000	1.800000e+04	15300.000000
max	19563.000000	6.000000	5.000000	2.856000e+07	45220.000000

Read rest of the files

In [18]:
```
df_date = pd.read_csv('datasets/dim_date.csv')
df_hotels = pd.read_csv('datasets/dim_hotels.csv')
df_rooms = pd.read_csv('datasets/dim_rooms.csv')
df_agg_bookings = pd.read_csv('datasets/fact_aggregated_bookings.csv')
```

In [19]:
```
df_hotels.shape
```

Out[19]:
```
(25, 4)
```

In [20]:
```
df_hotels.head(3)
```

Out[20]:

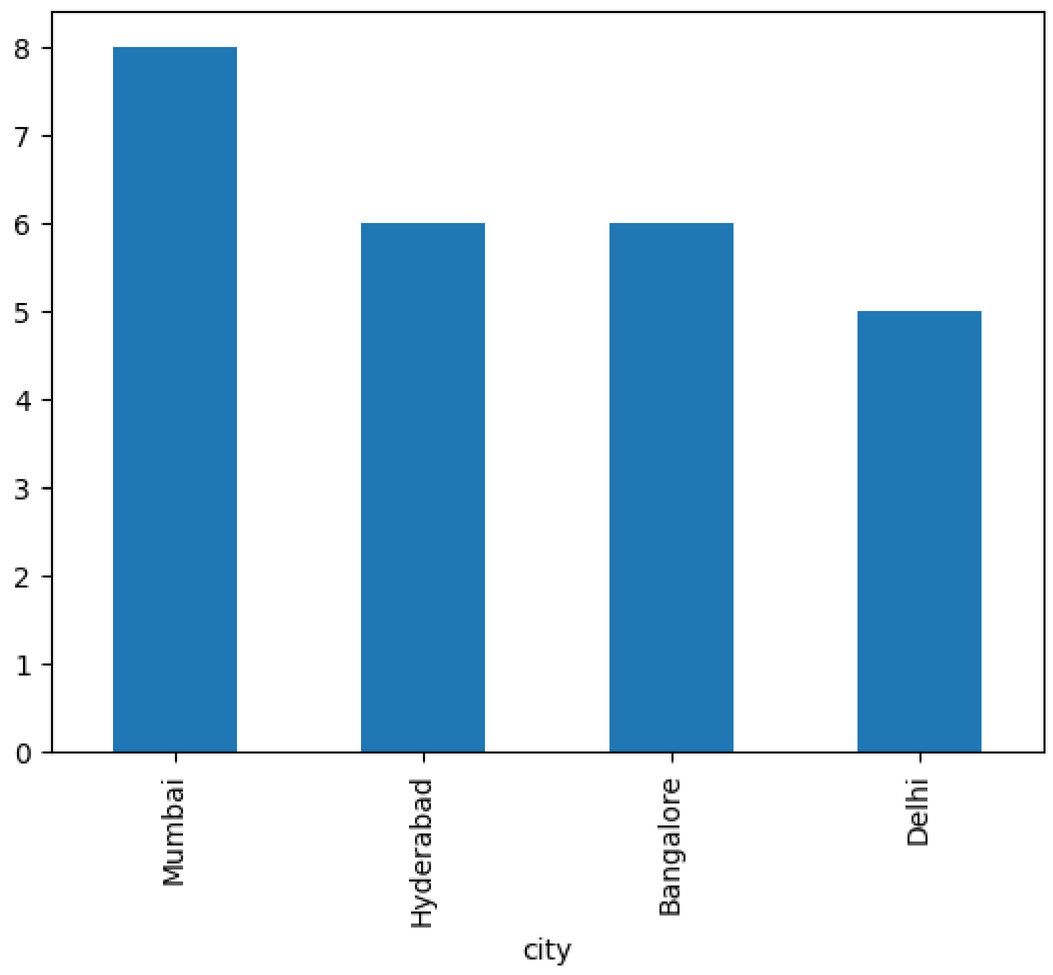
	property_id	property_name	category	city
0	16558	Atliq Grands	Luxury	Delhi
1	16559	Atliq Exotica	Luxury	Mumbai
2	16560	Atliq City	Business	Delhi

In [21]:
```
df_hotels.category.value_counts()
```

Out[21]:
```
category
Luxury      16
Business     9
Name: count, dtype: int64
```

In [22]:
```
df_hotels.city.value_counts().plot(kind="bar")
```

Out[22]:
```
<Axes: xlabel='city'>
```



Explore aggregate bookings

In [23]:
```
df_agg_bookings.head(3)
```

Out[23]:

	property_id	check_in_date	room_category	successful_bookings	capacity
0	16559	1-May-22	RT1	25	30.0
1	19562	1-May-22	RT1	28	30.0
2	19563	1-May-22	RT1	23	30.0

1. Find out unique property ids in aggregate bookings dataset

In [24]:
```
df_agg_bookings.property_id.unique()
```

Out[24]:
```
array([16559, 19562, 19563, 17558, 16558, 17560, 19558, 19560, 17561,
       16560, 16561, 16562, 16563, 17559, 17562, 17563, 18558, 18559,
       18561, 18562, 18563, 19559, 19561, 17564, 18560], dtype=int64)
```

2. Find out total bookings per property_id

```
In [26]: df_agg_bookings.groupby("property_id")["successful_bookings"].sum()
```

```
Out[26]: property_id
16558    3153
16559    7338
16560    4693
16561    4418
16562    4820
16563    7211
17558    5053
17559    6142
17560    6013
17561    5183
17562    3424
17563    6337
17564    3982
18558    4475
18559    5256
18560    6638
18561    6458
18562    7333
18563    4737
19558    4400
19559    4729
19560    6079
19561    5736
19562    5812
19563    5413
Name: successful_bookings, dtype: int64
```

3. Find out days on which bookings are greater than capacity

```
In [27]: df_agg_bookings[df_agg_bookings.successful_bookings>df_agg_bookings.capacity]
```

Out[27]:

	property_id	check_in_date	room_category	successful_bookings	capacity
3	17558	1-May-22	RT1	30	19.0
12	16563	1-May-22	RT1	100	41.0
4136	19558	11-Jun-22	RT2	50	39.0
6209	19560	2-Jul-22	RT1	123	26.0
8522	19559	25-Jul-22	RT1	35	24.0
9194	18563	31-Jul-22	RT4	20	18.0

4. Find out properties that have highest capacity

```
In [28]: df_agg_bookings[df_agg_bookings.capacity==df_agg_bookings.capacity.max()]
```

Out[28]:

	property_id	check_in_date	room_category	successful_bookings	capacity
27	17558	1-May-22	RT2	38	50.0
128	17558	2-May-22	RT2	27	50.0
229	17558	3-May-22	RT2	26	50.0
328	17558	4-May-22	RT2	27	50.0
428	17558	5-May-22	RT2	29	50.0
...	...	...	...	...	...
8728	17558	27-Jul-22	RT2	22	50.0
8828	17558	28-Jul-22	RT2	21	50.0
8928	17558	29-Jul-22	RT2	23	50.0
9028	17558	30-Jul-22	RT2	32	50.0
9128	17558	31-Jul-22	RT2	30	50.0

92 rows × 5 columns

==> 2. Data Cleaning

---

df_bookings.describe()

(1) Clean invalid guests

In [30]:
```
df_bookings[df_bookings.no_guests<=0]
```

Out[30]:

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
0	May012216558RT11	16558.0	27-04-22	1/5/2022	2/5/2022	-3.0
3	May012216558RT14	16558.0	28-04-22	1/5/2022	2/5/2022	-2.0

As you can see above, number of guests having less than zero value represents data error. We can ignore these records.

In [31]:
```
df_bookings = df_bookings[df_bookings.no_guests>0]
```

In [32]:
```
df_bookings.shape
```

Out[32]:
```
(11486, 12)
```

(2) Outlier removal in revenue generated

In [33]:
```
df_bookings.revenue_generated.min(), df_bookings.revenue_generated.max()
```
Out[33]:
```
(6500.0, 28560000.0)
```
In [34]:
```
df_bookings.revenue_generated.mean(), df_bookings.revenue_generated.median()
```
Out[34]:
```
(19446.358610482326, 13500.0)
```
In [35]:
```
avg, std = df_bookings.revenue_generated.mean(), df_bookings.revenue_generated.std(
```
In [36]:
```
higher_limit = avg + 3*std
higher_limit
```
Out[36]:
```
930814.1340478883
```
In [37]:
```
lower_limit = avg - 3*std
lower_limit
```
Out[37]:
```
-891921.4168269237
```
In [38]:
```
df_bookings[df_bookings.revenue_generated<=0]
```
Out[38]:

booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests	room_c

In [39]:
```
df_bookings[df_bookings.revenue_generated>higher_limit]
```
Out[39]:

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_gue
2	May012216558RT13	16558.0	28-04-22	1/5/2022	4/5/2022	
111	May012216559RT32	16559.0	29-04-22	1/5/2022	2/5/2022	
315	May012216562RT22	16562.0	28-04-22	1/5/2022	4/5/2022	
562	May012217559RT118	17559.0	26-04-22	1/5/2022	2/5/2022	

In [40]:
```
df_bookings = df_bookings[df_bookings.revenue_generated<=higher_limit]
df_bookings.shape
```
Out[40]:
```
(11482, 12)
```
In [41]:
```
df_bookings.revenue_realized.describe()
```
Out[41]:
```
count    11482.000000
mean     12622.899495
std       6882.946850
min       2600.000000
25%       7600.000000
50%      11400.000000
75%      15300.000000
max      45220.000000
Name: revenue_realized, dtype: float64
```

```
In [42]: higher_limit = df_bookings.revenue_realized.mean() + 3*df_bookings.revenue_realized
         higher_limit
```

```
Out[42]: 33271.74004456424
```

```
In [43]: df_bookings[df_bookings.revenue_realized>higher_limit]
```

Out[43]:

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_g
137	May012216559RT41	16559.0	27-04-22	1/5/2022	7/5/2022	
139	May012216559RT43	16559.0	1/5/2022	1/5/2022	2/5/2022	
143	May012216559RT47	16559.0	28-04-22	1/5/2022	3/5/2022	
149	May012216559RT413	16559.0	24-04-22	1/5/2022	7/5/2022	
222	May012216560RT45	16560.0	30-04-22	1/5/2022	3/5/2022	
...	...	...	...	...	...	
11121	May082216559RT411	16559.0	17-04-22	8/5/2022	12/5/2022	
11123	May082216559RT413	16559.0	1/5/2022	8/5/2022	10/5/2022	
11194	May082216560RT41	16560.0	7/5/2022	8/5/2022	9/5/2022	
11330	May082216562RT41	16562.0	5/5/2022	8/5/2022	13-05-22	
11432	May082216563RT48	16563.0	8/5/2022	8/5/2022	9/5/2022	

118 rows × 12 columns

One observation we can have in above dataframe is that all rooms are RT4 which means presidential suit. Now since RT4 is a luxurious room it is likely their rent will be higher. To make a fair analysis, we need to do data analysis only on RT4 room types.

```
In [44]: df_bookings[df_bookings.room_category=="RT4"].revenue_realized.describe()
```

```
Out[44]: count     1363.000000
         mean     23353.300073
         std       9054.673816
         min       7600.000000
         25%      15960.000000
         50%      26600.000000
         75%      32300.000000
         max      45220.000000
         Name: revenue_realized, dtype: float64
```

```
In [45]: # mean + 3*standard deviation
         23439+3*9048
```

```
Out[45]: 50583
```

Here higher limit comes to be 50583 and in our dataframe above we can see that max value for revenue realized is 45220. Hence we can conclude that there is no outlier and we don't need to do any data cleaning on this particular column.

In [46]:
```
df_bookings.isnull().sum()
```

Out[46]:
```
booking_id              0
property_id             0
booking_date            0
check_in_date           0
checkout_date           0
no_guests               0
room_category           0
booking_platform        0
ratings_given        6689
booking_status          0
revenue_generated       0
revenue_realized        0
dtype: int64
```

Since there are many rows with null rating, we should not filter these values. Also we should not replace this rating with a median or mean rating etc

(3) In aggregate bookings find columns that have null values. Fill these null values with whatever you think is the appropriate subtitute (possible ways is to use mean or median)

In [47]:
```
df_agg_bookings.isnull().sum()
```

Out[47]:
```
property_id            0
check_in_date          0
room_category          0
successful_bookings    0
capacity               2
dtype: int64
```

In [48]:
```
df_agg_bookings[df_agg_bookings.capacity.isna()]
```

Out[48]:

	property_id	check_in_date	room_category	successful_bookings	capacity
8	17561	1-May-22	RT1	22	NaN
14	17562	1-May-22	RT1	12	NaN

In [49]:
```
df_agg_bookings.capacity.median()
```

Out[49]:
```
25.0
```

In [50]:
```
df_agg_bookings.capacity.fillna(df_agg_bookings.capacity.median(), inplace=True)
```

In [51]:
```
df_agg_bookings.loc[[8,15]]
```

Out[51]:

	property_id	check_in_date	room_category	successful_bookings	capacity
8	17561	1-May-22	RT1	22	25.0
15	17563	1-May-22	RT1	21	25.0

(4) In aggregate bookings find out records that have successful_bookings value greater than capacity. Filter those records

In [52]:
```
df_agg_bookings[df_agg_bookings.successful_bookings>df_agg_bookings.capacity]
```

Out[52]:

	property_id	check_in_date	room_category	successful_bookings	capacity
3	17558	1-May-22	RT1	30	19.0
12	16563	1-May-22	RT1	100	41.0
4136	19558	11-Jun-22	RT2	50	39.0
6209	19560	2-Jul-22	RT1	123	26.0
8522	19559	25-Jul-22	RT1	35	24.0
9194	18563	31-Jul-22	RT4	20	18.0

In [53]:
```
df_agg_bookings.shape
```

Out[53]:
```
(9200, 5)
```

In [54]:
```
df_agg_bookings = df_agg_bookings[df_agg_bookings.successful_bookings<=df_agg_booki
df_agg_bookings.shape
```

Out[54]:
```
(9194, 5)
```

==> 3. Data Transformation

Create occupancy percentage column

In [57]:
```
df_agg_bookings.head(3)
```

Out[57]:

	property_id	check_in_date	room_category	successful_bookings	capacity
0	16559	1-May-22	RT1	25	30.0
1	19562	1-May-22	RT1	28	30.0
2	19563	1-May-22	RT1	23	30.0

In [58]:
```
df_agg_bookings['occ_pct'] = df_agg_bookings.apply(lambda row: row['successful_book
df_agg_bookings.head(3)
```

Out[58]:

	property_id	check_in_date	room_category	successful_bookings	capacity	occ_pct
0	16559	1-May-22	RT1	25	30.0	0.833333
1	19562	1-May-22	RT1	28	30.0	0.933333
2	19563	1-May-22	RT1	23	30.0	0.766667

Convert it to a percentage value

In [59]:
```
df_agg_bookings['occ_pct'] = df_agg_bookings['occ_pct'].apply(lambda x: round(x*100
df_agg_bookings.head(3)
```

Out[59]:

	property_id	check_in_date	room_category	successful_bookings	capacity	occ_pct
0	16559	1-May-22	RT1	25	30.0	83.33
1	19562	1-May-22	RT1	28	30.0	93.33
2	19563	1-May-22	RT1	23	30.0	76.67

In [61]:
```
df_agg_bookings.head()
```

Out[61]:

	property_id	check_in_date	room_category	successful_bookings	capacity	occ_pct
0	16559	1-May-22	RT1	25	30.0	83.33
1	19562	1-May-22	RT1	28	30.0	93.33
2	19563	1-May-22	RT1	23	30.0	76.67
4	16558	1-May-22	RT1	18	19.0	94.74
5	17560	1-May-22	RT1	28	40.0	70.00

In [62]:
```
df_agg_bookings.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 9194 entries, 0 to 9199
Data columns (total 6 columns):
 #   Column               Non-Null Count  Dtype  
---  ------               --------------  -----  
 0   property_id          9194 non-null   int64  
 1   check_in_date        9194 non-null   object 
 2   room_category        9194 non-null   object 
 3   successful_bookings  9194 non-null   int64  
 4   capacity             9194 non-null   float64
 5   occ_pct              9194 non-null   float64
dtypes: float64(2), int64(2), object(2)
memory usage: 502.8+ KB
```

There are various types of data transformations that you may have to perform based on the need. Few examples of data transformations are,

1. Creating new columns
2. Normalization
3. Merging data
4. Aggregation

==> 4. Insights Generation

---

1. What is an average occupancy rate in each of the room categories?

```
In [65]: df_agg_bookings.head(3)
```

Out[65]:

	property_id	check_in_date	room_category	successful_bookings	capacity	occ_pct
0	16559	1-May-22	RT1	25	30.0	83.33
1	19562	1-May-22	RT1	28	30.0	93.33
2	19563	1-May-22	RT1	23	30.0	76.67

```
In [66]: df_agg_bookings.groupby("room_category")["occ_pct"].mean()
```

```
Out[66]: room_category
RT1    57.889643
RT2    58.009756
RT3    58.028213
RT4    59.277925
Name: occ_pct, dtype: float64
```

I don't understand RT1, RT2 etc. Print room categories such as Standard, Premium, Elite etc along with average occupancy percentage

```
In [67]: df = pd.merge(df_agg_bookings, df_rooms, left_on="room_category", right_on="room_id
         df.head(4)
```

Out[67]:

	property_id	check_in_date	room_category	successful_bookings	capacity	occ_pct	roon
0	16559	1-May-22	RT1	25	30.0	83.33	
1	19562	1-May-22	RT1	28	30.0	93.33	
2	19563	1-May-22	RT1	23	30.0	76.67	
3	16558	1-May-22	RT1	18	19.0	94.74	

```
In [68]: df.drop("room_id",axis=1, inplace=True)
         df.head(4)
```

Out[68]:

	property_id	check_in_date	room_category	successful_bookings	capacity	occ_pct	roon
0	16559	1-May-22	RT1	25	30.0	83.33	St
1	19562	1-May-22	RT1	28	30.0	93.33	St
2	19563	1-May-22	RT1	23	30.0	76.67	St
3	16558	1-May-22	RT1	18	19.0	94.74	St

In [69]:
```
df.groupby("room_class")["occ_pct"].mean()
```

Out[69]:
```
room_class
Elite           58.009756
Premium         58.028213
Presidential    59.277925
Standard        57.889643
Name: occ_pct, dtype: float64
```

In [70]:
```
df[df.room_class=="Standard"].occ_pct.mean()
```

Out[70]:
```
57.88964285714285
```

2. Print average occupancy rate per city

In [71]:
```
df_hotels.head(3)
```

Out[71]:

	property_id	property_name	category	city
0	16558	Atliq Grands	Luxury	Delhi
1	16559	Atliq Exotica	Luxury	Mumbai
2	16560	Atliq City	Business	Delhi

In [72]:
```
df = pd.merge(df, df_hotels, on="property_id")
df.head(3)
```

Out[72]:

	property_id	check_in_date	room_category	successful_bookings	capacity	occ_pct	roon
0	16559	1-May-22	RT1	25	30.0	83.33	St
1	16559	2-May-22	RT1	20	30.0	66.67	St
2	16559	3-May-22	RT1	17	30.0	56.67	St

In [73]:
```
df.groupby("city")["occ_pct"].mean()
```

Out[73]:
```
city
Bangalore    56.332376
Delhi        61.507341
Hyderabad    58.120652
Mumbai       57.909181
Name: occ_pct, dtype: float64
```

3. When was the occupancy better? Weekday or Weekend?

In [75]:
```
df = pd.merge(df, df_date, left_on="check_in_date", right_on="date")
df.head(3)
```

Out[75]:

	property_id	check_in_date	room_category	successful_bookings	capacity	occ_pct	roon
0	16559	10-May-22	RT1	18	30.0	60.00	St
1	16559	10-May-22	RT2	25	41.0	60.98	
2	16559	10-May-22	RT3	20	32.0	62.50	Pr

In [76]:
```
df.groupby("day_type")["occ_pct"].mean().round(2)
```

Out[76]:
```
day_type
weekeday    50.88
weekend     72.34
Name: occ_pct, dtype: float64
```

4: In the month of June, what is the occupancy for different cities

In [78]:
```
df_june_22 = df[df["mmm yy"]=="Jun 22"]
df_june_22.head(4)
```

Out[78]:

	property_id	check_in_date	room_category	successful_bookings	capacity	occ_pct	r
2200	16559	10-Jun-22	RT1	20	30.0	66.67	
2201	16559	10-Jun-22	RT2	26	41.0	63.41	
2202	16559	10-Jun-22	RT3	20	32.0	62.50	
2203	16559	10-Jun-22	RT4	11	18.0	61.11	F

In [79]:
```
df_june_22.groupby('city')['occ_pct'].mean().round(2).sort_values(ascending=False)
```

Out[79]:

```
city
Delhi        62.47
Hyderabad    58.46
Mumbai       58.38
Bangalore    56.44
Name: occ_pct, dtype: float64
```

5: We got new data for the month of august. Append that to existing data

In [81]:

```
df_august = pd.read_csv("datasets/new_data_august.csv")
df_august.head(3)
```

Out[81]:

	property_id	property_name	category	city	room_category	room_class	check_in_
0	16559	Atliq Exotica	Luxury	Mumbai	RT1	Standard	01-Au
1	19562	Atliq Bay	Luxury	Bangalore	RT1	Standard	01-Au
2	19563	Atliq Palace	Business	Bangalore	RT1	Standard	01-Au

In [82]:

```
df_august.columns
```

Out[82]:

```
Index(['property_id', 'property_name', 'category', 'city', 'room_category',
       'room_class', 'check_in_date', 'mmm yy', 'week no', 'day_type',
       'successful_bookings', 'capacity', 'occ%'],
      dtype='object')
```

In [83]:

```
df.columns
```

Out[83]:

```
Index(['property_id', 'check_in_date', 'room_category', 'successful_bookings',
       'capacity', 'occ_pct', 'room_class', 'property_name', 'category',
       'city', 'date', 'mmm yy', 'week no', 'day_type'],
      dtype='object')
```

In [84]:

```
df_august.shape
```

Out[84]:

```
(7, 13)
```

In [85]:

```
df.shape
```

Out[85]:

```
(6497, 14)
```

In [86]:

```
latest_df = pd.concat([df, df_august], ignore_index = True, axis = 0)
latest_df.tail(10)
```

Out[86]:

	property_id	check_in_date	room_category	successful_bookings	capacity	occ_pct	r
6494	16563	31-Jul-22	RT2	32	38.0	84.21	
6495	16563	31-Jul-22	RT3	14	20.0	70.00	
6496	16563	31-Jul-22	RT4	13	18.0	72.22	F
6497	16559	01-Aug-22	RT1	30	30.0	NaN	
6498	19562	01-Aug-22	RT1	21	30.0	NaN	
6499	19563	01-Aug-22	RT1	23	30.0	NaN	
6500	19558	01-Aug-22	RT1	30	40.0	NaN	
6501	19560	01-Aug-22	RT1	20	26.0	NaN	
6502	17561	01-Aug-22	RT1	18	26.0	NaN	
6503	17564	01-Aug-22	RT1	10	16.0	NaN	

In [87]:
```
latest_df.shape
```

Out[87]:
```
(6504, 15)
```

6. Print revenue realized per city

In [88]:
```
df_bookings.head()
```

Out[88]:

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
1	May012216558RT12	16558.0	30-04-22	1/5/2022	2/5/2022	2.0
4	May012216558RT15	16558.0	27-04-22	1/5/2022	2/5/2022	4.0
5	May012216558RT16	16558.0	1/5/2022	1/5/2022	3/5/2022	2.0
6	May012216558RT17	16558.0	28-04-22	1/5/2022	6/5/2022	2.0
7	May012216558RT18	16558.0	26-04-22	1/5/2022	3/5/2022	2.0

In [89]:
```
df_hotels.head(3)
```

Out[89]:

	property_id	property_name	category	city
0	16558	Atliq Grands	Luxury	Delhi
1	16559	Atliq Exotica	Luxury	Mumbai
2	16560	Atliq City	Business	Delhi

In [90]:
```
df_bookings_all = pd.merge(df_bookings, df_hotels, on="property_id")
df_bookings_all.head(3)
```

Out[90]:

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
0	May012216558RT12	16558.0	30-04-22	1/5/2022	2/5/2022	2.0
1	May012216558RT15	16558.0	27-04-22	1/5/2022	2/5/2022	4.0
2	May012216558RT16	16558.0	1/5/2022	1/5/2022	3/5/2022	2.0

In [91]:
```
df_bookings_all.groupby("city")["revenue_realized"].sum()
```

Out[91]:
```
city
Bangalore    34523895.0
Delhi        28297514.0
Hyderabad    26694910.0
Mumbai       55419813.0
Name: revenue_realized, dtype: float64
```

7. Print month by month revenue

In [92]:
```
df_date.head(3)
```

Out[92]:

	date	mmm yy	week no	day_type
0	01-May-22	May 22	W 19	weekend
1	02-May-22	May 22	W 19	weekeday
2	03-May-22	May 22	W 19	weekeday

In [93]:
```
df_date["mmm yy"].unique()
```

Out[93]:
```
array(['May 22', 'Jun 22', 'Jul 22'], dtype=object)
```

In [94]:
```
df_bookings_all.head(3)
```

Out[94]:

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
0	May012216558RT12	16558.0	30-04-22	1/5/2022	2/5/2022	2.0
1	May012216558RT15	16558.0	27-04-22	1/5/2022	2/5/2022	4.0
2	May012216558RT16	16558.0	1/5/2022	1/5/2022	3/5/2022	2.0

In [95]:

```
df_date.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 92 entries, 0 to 91
Data columns (total 4 columns):
 #   Column    Non-Null Count  Dtype 
---  ------    --------------  ----- 
 0   date      92 non-null     object
 1   mmm yy    92 non-null     object
 2   week no   92 non-null     object
 3   day_type  92 non-null     object
dtypes: object(4)
memory usage: 3.0+ KB
```

In [98]:

```
df_date["date"] = pd.to_datetime(df_date["date"])
df_date.head(3)
```

Out[98]:

	date	mmm yy	week no	day_type
0	2022-05-01	May 22	W 19	weekend
1	2022-05-02	May 22	W 19	weekeday
2	2022-05-03	May 22	W 19	weekeday

In [99]:

```

```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 11482 entries, 0 to 11481
Data columns (total 15 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   booking_id         11482 non-null  object
 1   property_id        11482 non-null  float64
 2   booking_date       11482 non-null  object
 3   check_in_date      11482 non-null  datetime64[ns]
 4   checkout_date      11482 non-null  object
 5   no_guests          11482 non-null  float64
 6   room_category      11482 non-null  object
 7   booking_platform   11482 non-null  object
 8   ratings_given      4793 non-null   float64
 9   booking_status     11482 non-null  object
 10  revenue_generated  11482 non-null  float64
 11  revenue_realized   11482 non-null  float64
 12  property_name      11482 non-null  object
 13  category           11482 non-null  object
 14  city               11482 non-null  object
dtypes: datetime64[ns](1), float64(5), object(9)
memory usage: 1.3+ MB
```

In [100…

```
df_bookings_all["check_in_date"] = pd.to_datetime(df_bookings_all["check_in_date"])
df_bookings_all.head(4)
```

Out[100…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
0	May012216558RT12	16558.0	30-04-22	2022-01-05	2/5/2022	2.0
1	May012216558RT15	16558.0	27-04-22	2022-01-05	2/5/2022	4.0
2	May012216558RT16	16558.0	1/5/2022	2022-01-05	3/5/2022	2.0
3	May012216558RT17	16558.0	28-04-22	2022-01-05	6/5/2022	2.0

In [101…

```
df_bookings_all.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 11482 entries, 0 to 11481
Data columns (total 15 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   booking_id         11482 non-null  object
 1   property_id        11482 non-null  float64
 2   booking_date       11482 non-null  object
 3   check_in_date      11482 non-null  datetime64[ns]
 4   checkout_date      11482 non-null  object
 5   no_guests          11482 non-null  float64
 6   room_category      11482 non-null  object
 7   booking_platform   11482 non-null  object
 8   ratings_given      4793 non-null   float64
 9   booking_status     11482 non-null  object
 10  revenue_generated  11482 non-null  float64
 11  revenue_realized   11482 non-null  float64
 12  property_name      11482 non-null  object
 13  category           11482 non-null  object
 14  city               11482 non-null  object
dtypes: datetime64[ns](1), float64(5), object(9)
memory usage: 1.3+ MB
```

In [102…

```
df_bookings_all = pd.merge(df_bookings_all, df_date, left_on="check_in_date", right
df_bookings_all.head(3)
```

Out[102…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
0	May052216558RT11	16558.0	15-04-22	2022-05-05	7/5/2022	3.0
1	May052216558RT12	16558.0	30-04-22	2022-05-05	7/5/2022	2.0
2	May052216558RT13	16558.0	1/5/2022	2022-05-05	6/5/2022	3.0

In [103…

```
df_bookings_all.groupby("mmm yy")["revenue_realized"].sum()
```

Out[103…

```
mmm yy
Jul 22    25221983.0
Jun 22    17426886.0
May 22    17901036.0
Name: revenue_realized, dtype: float64
```

(8) Print revenue realized per hotel type

In [105…

```
df_bookings_all.property_name.unique()
```

Out[105…

```
array(['Atliq Grands', 'Atliq Exotica', 'Atliq City', 'Atliq Blu',
       'Atliq Bay', 'Atliq Palace', 'Atliq Seasons'], dtype=object)
```

In [106…

```
df_bookings_all.groupby("property_name")["revenue_realized"].sum().round(2).sort_va
```

Out[106…

```
property_name
Atliq Seasons     2420970.0
Atliq Grands      7613470.0
Atliq Blu         9121570.0
Atliq Bay         9256497.0
Atliq City       10146665.0
Atliq Palace     10776278.0
Atliq Exotica    11214455.0
Name: revenue_realized, dtype: float64
```

(8) Print average rating per city

In [108…

```
df_bookings_all.groupby("city")["ratings_given"].mean().round(2).sort_values()
```

Out[108…

```
city
Bangalore    3.43
Hyderabad    3.67
Mumbai       3.67
Delhi        3.84
Name: ratings_given, dtype: float64
```

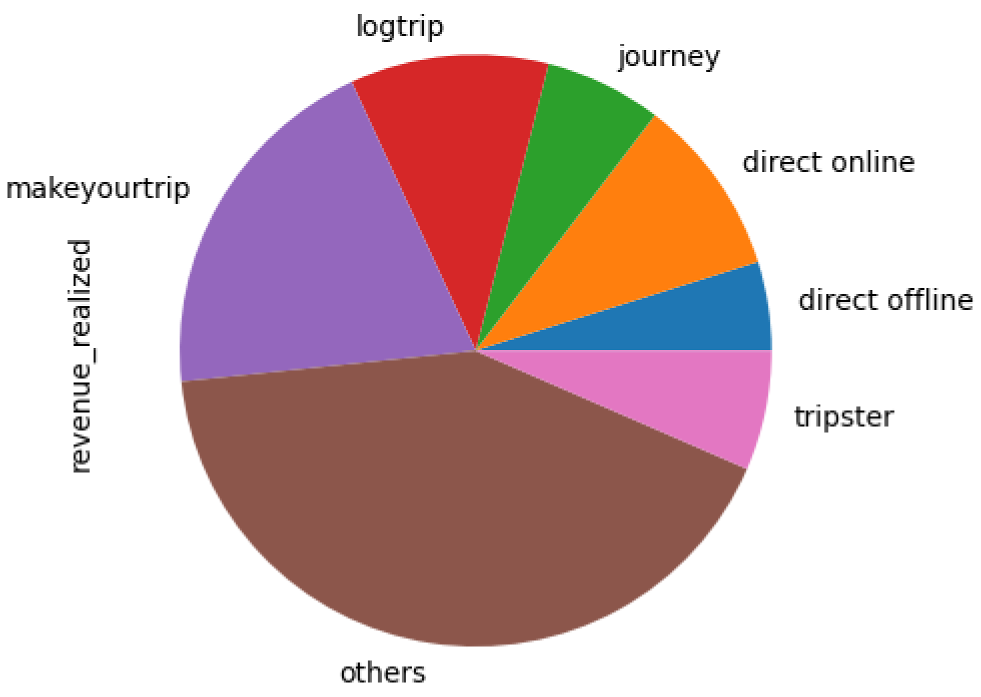
(9) Print a pie chart of revenue realized per booking platform

In [109…

```
df_bookings_all.groupby("booking_platform")["revenue_realized"].sum().plot(kind="pi
```

Out[109…

```
<Axes: ylabel='revenue_realized'>
```



In [ ]: