AtliQ Hotels Data Analysis Project

In [1]:
```
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 [2]:
```
df_bookings = pd.read_csv('datasets/fact_bookings.csv')
```

Explore bookings data

In [3]:
```
df_bookings.head()
```

Out[3]:

	booking_id	property_id	booking_date	check_in_date	checkout_dat
0	May012216558RT11	16558	27-04-22	1/5/2022	2/5/202
1	May012216558RT12	16558	30-04-22	1/5/2022	2/5/202
2	May012216558RT13	16558	28-04-22	1/5/2022	4/5/202
3	May012216558RT14	16558	28-04-22	1/5/2022	2/5/202
4	May012216558RT15	16558	27-04-22	1/5/2022	2/5/202

In [4]:
```
df_bookings.shape
```

Out[4]:
```
(134590, 12)
```

In [5]:
```
df_bookings.room_category.unique()
```

Out[5]:
```
array(['RT1', 'RT2', 'RT3', 'RT4'], dtype=object)
```

```
In [6]: df_bookings.booking_platform.unique()
```

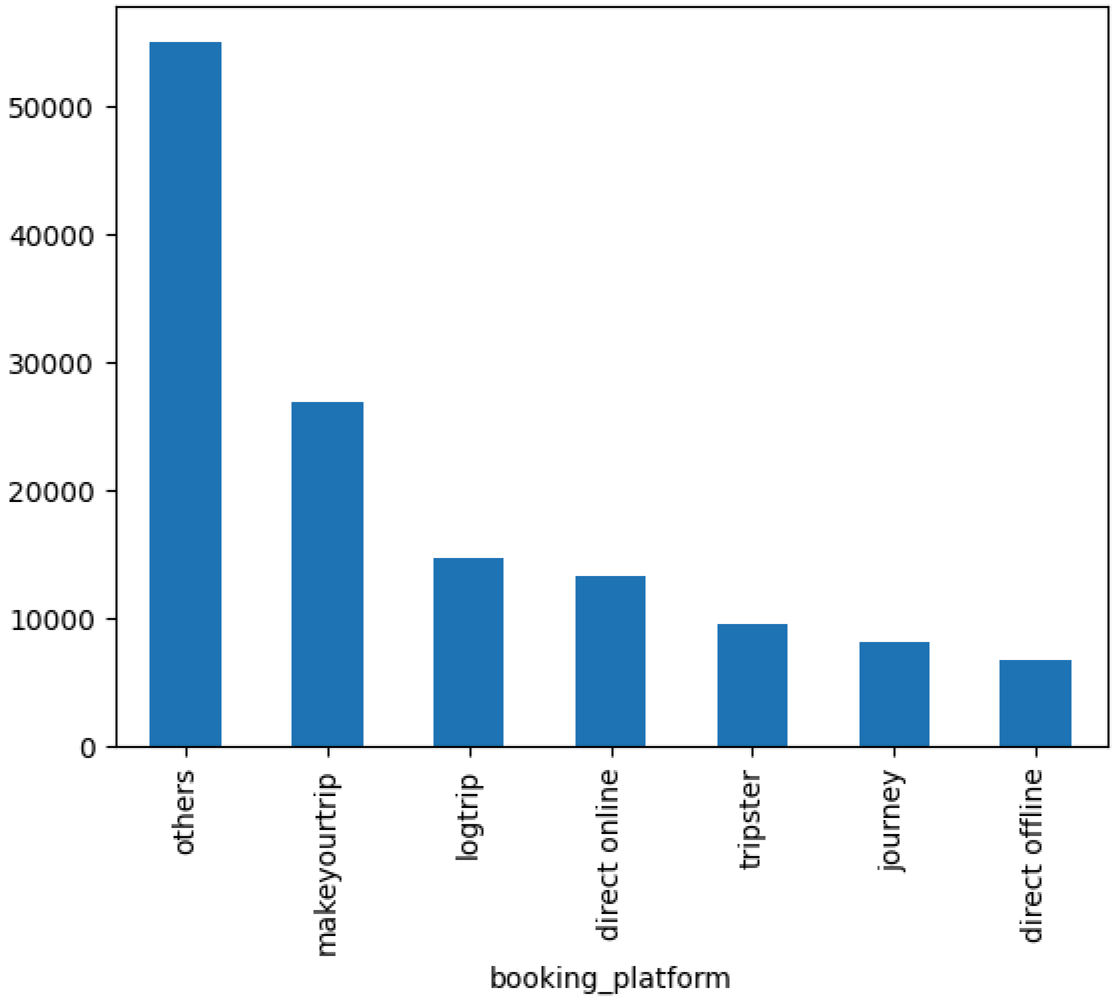
```
Out[6]: array(['direct online', 'others', 'logtrip', 'tripster', 'makeyourtrip',
               'journey', 'direct offline'], dtype=object)
```

```
In [7]: df_bookings.booking_platform.value_counts()
```

```
Out[7]: booking_platform
        others            55066
        makeyourtrip      26898
        logtrip           14756
        direct online     13379
        tripster           9630
        journey            8106
        direct offline     6755
        Name: count, dtype: int64
```

```
In [8]: df_bookings.booking_platform.value_counts().plot(kind="bar")
```

```
Out[8]: <Axes: xlabel='booking_platform'>
```



```
In [9]: df_bookings.describe()
```

Out[9]:

	property_id	no_guests	ratings_given	revenue_generated	rever
count	134590.000000	134587.000000	56683.000000	1.345900e+05	13
mean	18061.113493	2.036170	3.619004	1.537805e+04	1
std	1093.055847	1.034885	1.235009	9.303604e+04	
min	16558.000000	-17.000000	1.000000	6.500000e+03	
25%	17558.000000	1.000000	3.000000	9.900000e+03	
50%	17564.000000	2.000000	4.000000	1.350000e+04	1
75%	18563.000000	2.000000	5.000000	1.800000e+04	1
max	19563.000000	6.000000	5.000000	2.856000e+07	4

Read rest of the files

In [10]:
```
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 [11]:
```
df_hotels.shape
```

Out[11]:
```
(25, 4)
```

In [12]:
```
df_hotels.head(3)
```

Out[12]:

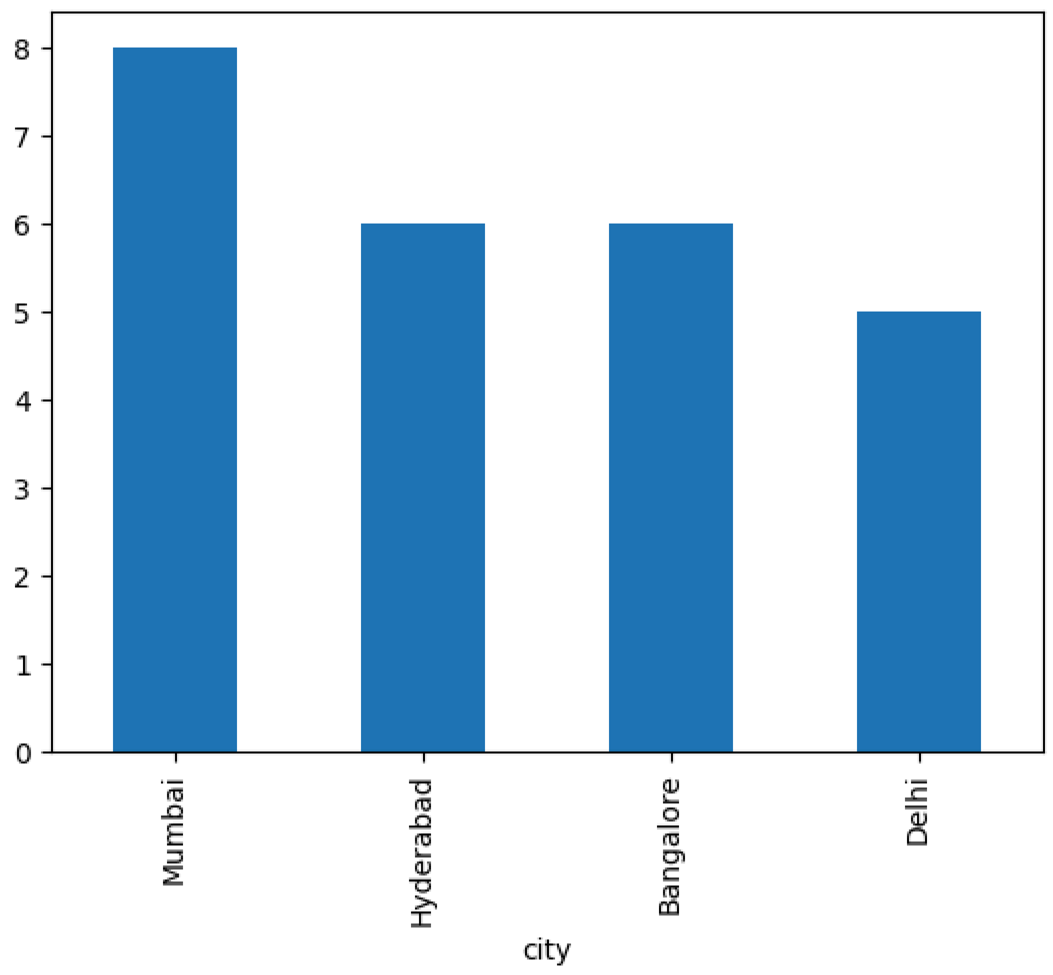
	property_id	property_name	category	city
0	16558	Atliq Grands	Luxury	Delhi
1	16559	Atliq Exotica	Luxury	Mumbai
2	16560	Atliq City	Business	Delhi

In [13]:
```
df_hotels.category.value_counts()
```

Out[13]:
```
category
Luxury      16
Business     9
Name: count, dtype: int64
```

In [14]:
```
df_hotels.city.value_counts().plot(kind="bar")
```

Out[14]:
```
<Axes: xlabel='city'>
```



Exercise: Explore aggregate bookings

In [15]:
```
df_agg_bookings.head(3)
```

Out[15]:

	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

Exercise-1. Find out unique property ids in aggregate bookings dataset

In [16]:
```
# write your code here
df_agg_bookings.property_id.unique()
```

Out[16]:
```
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])
```

Exercise-2. Find out total bookings per property_id

```
In [17]: # write your code here
         df_agg_bookings.groupby("property_id")["successful_bookings"].sum()
```

```
Out[17]: 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
```

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

```
In [18]: # write your code here
         df_agg_bookings[df_agg_bookings.successful_bookings>df_agg_bookings.capacity
```

Out[18]:

	property_id	check_in_date	room_category	successful_bookings	capaci
3	17558	1-May-22	RT1	30	19
12	16563	1-May-22	RT1	100	41
4136	19558	11-Jun-22	RT2	50	39
6209	19560	2-Jul-22	RT1	123	26
8522	19559	25-Jul-22	RT1	35	24
9194	18563	31-Jul-22	RT4	20	18

Exercise-4. Find out properties that have highest capacity

```
In [19]: df_agg_bookings.capacity.max()
```

```
Out[19]: np.float64(50.0)
```

```
In [20]: # write your code here
         df_agg_bookings[df_agg_bookings.capacity==df_agg_bookings.capacity.max()]
```

Out[20]:

	property_id	check_in_date	room_category	successful_bookings	capaci
27	17558	1-May-22	RT2	38	50
128	17558	2-May-22	RT2	27	50
229	17558	3-May-22	RT2	26	50
328	17558	4-May-22	RT2	27	50
428	17558	5-May-22	RT2	29	50
...	...	...	...	...	
8728	17558	27-Jul-22	RT2	22	50
8828	17558	28-Jul-22	RT2	21	50
8928	17558	29-Jul-22	RT2	23	50
9028	17558	30-Jul-22	RT2	32	50
9128	17558	31-Jul-22	RT2	30	50

92 rows × 5 columns

==> 2. Data Cleaning

```
In [21]: df_bookings.describe()
```

Out[21]:

	property_id	no_guests	ratings_given	revenue_generated	rever
count	134590.000000	134587.000000	56683.000000	1.345900e+05	13
mean	18061.113493	2.036170	3.619004	1.537805e+04	1
std	1093.055847	1.034885	1.235009	9.303604e+04	
min	16558.000000	-17.000000	1.000000	6.500000e+03	
25%	17558.000000	1.000000	3.000000	9.900000e+03	
50%	17564.000000	2.000000	4.000000	1.350000e+04	1
75%	18563.000000	2.000000	5.000000	1.800000e+04	1
max	19563.000000	6.000000	5.000000	2.856000e+07	4

(1) Clean invalid guests

```
In [22]: df_bookings[df_bookings.no_guests<=0]
```

Out[22]:

	booking_id	property_id	booking_date	check_in_date	checko
0	May012216558RT11	16558	27-04-22	1/5/2022	
3	May012216558RT14	16558	28-04-22	1/5/2022	
17924	May122218559RT44	18559	12/5/2022	12/5/2022	
18020	May122218561RT22	18561	8/5/2022	12/5/2022	
18119	May122218562RT311	18562	5/5/2022	12/5/2022	
18121	May122218562RT313	18562	10/5/2022	12/5/2022	
56715	Jun082218562RT12	18562	5/6/2022	8/6/2022	
119765	Jul202219560RT220	19560	19-07-22	20-07-22	
134586	Jul312217564RT47	17564	30-07-22	31-07-22	

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

In [23]:
```
df_bookings = df_bookings[df_bookings.no_guests>0]
```

In [24]:
```
df_bookings.shape
```

Out[24]:
```
(134578, 12)
```

(2) Outlier removal in revenue generated

In [25]:
```
df_bookings.revenue_generated.min(), df_bookings.revenue_generated.max()
```

Out[25]:
```
(np.int64(6500), np.int64(28560000))
```

In [26]:
```
df_bookings.revenue_generated.mean(), df_bookings.revenue_generated.median()
```

Out[26]:
```
(np.float64(15378.036937686695), np.float64(13500.0))
```

In [27]:
```
avg, std = df_bookings.revenue_generated.mean(), df_bookings.revenue_generat
```

In [28]:
```
higher_limit = avg + 3*std
higher_limit
```

Out[28]:
```
np.float64(294498.50173207896)
```

In [29]:
```
lower_limit = avg - 3*std
lower_limit
```

Out[29]:
```
np.float64(-263742.4278567056)
```

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

Out[30]:

booking_id	property_id	booking_date	check_in_date	checkout_date	no_gu

In [31]:
```
df_bookings[df_bookings.revenue_generated>higher_limit]
```

Out[31]:

	booking_id	property_id	booking_date	check_in_date	checko
2	May012216558RT13	16558	28-04-22	1/5/2022	
111	May012216559RT32	16559	29-04-22	1/5/2022	
315	May012216562RT22	16562	28-04-22	1/5/2022	
562	May012217559RT118	17559	26-04-22	1/5/2022	
129176	Jul282216562RT26	16562	21-07-22	28-07-22	

In [32]:
```
df_bookings = df_bookings[df_bookings.revenue_generated<=higher_limit]
df_bookings.shape
```

Out[32]:
```
(134573, 12)
```

In [33]:
```
df_bookings.revenue_realized.describe()
```

Out[33]:
```
count    134573.000000
mean      12695.983585
std        6927.791692
min        2600.000000
25%        7600.000000
50%       11700.000000
75%       15300.000000
max       45220.000000
Name: revenue_realized, dtype: float64
```

In [34]:
```
higher_limit = df_bookings.revenue_realized.mean() + 3*df_bookings.revenue_r
higher_limit
```

Out[34]:
```
np.float64(33479.358661845814)
```

In [35]:
```
df_bookings[df_bookings.revenue_realized>higher_limit]
```

Out[35]:

	booking_id	property_id	booking_date	check_in_date	checko
137	May012216559RT41	16559	27-04-22	1/5/2022	
139	May012216559RT43	16559	1/5/2022	1/5/2022	
143	May012216559RT47	16559	28-04-22	1/5/2022	
149	May012216559RT413	16559	24-04-22	1/5/2022	
222	May012216560RT45	16560	30-04-22	1/5/2022	
...	...	...	...	...	
134328	Jul312219560RT49	19560	31-07-22	31-07-22	
134331	Jul312219560RT412	19560	31-07-22	31-07-22	
134467	Jul312219562RT45	19562	28-07-22	31-07-22	
134474	Jul312219562RT412	19562	25-07-22	31-07-22	
134581	Jul312217564RT42	17564	31-07-22	31-07-22	

1299 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 [36]:
```
df_bookings[df_bookings.room_category=="RT4"].revenue_realized.describe()
```

Out[36]:
```
count    16071.000000
mean     23439.308444
std       9048.599076
min       7600.000000
25%      19000.000000
50%      26600.000000
75%      32300.000000
max      45220.000000
Name: revenue_realized, dtype: float64
```

In [37]:
```
# mean + 3*standard deviation
23439+3*9048
```

Out[37]:
```
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 [38]:
```
df_bookings[df_bookings.booking_id=="May012216558RT213"]
```

Out[38]:

booking_id	property_id	booking_date	check_in_date	checkout_date	no_gu

In [39]:
```
df_bookings.isnull().sum()
```

Out[39]:
```
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        77897
booking_status           0
revenue_generated        0
revenue_realized         0
dtype: int64
```

Total values in our dataframe is 134576. Out of that 77899 rows has null rating. 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

In [ ]:
```

```

Exercise-1. 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 [40]:
```
# write your code here
df_agg_bookings.isnull().sum()
```

Out[40]:
```
property_id            0
check_in_date          0
room_category          0
successful_bookings    0
capacity               2
dtype: int64
```

In [41]:
```
df_agg_bookings[df_agg_bookings.capacity.isna()]
```

Out[41]:

	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 [42]:
```
df_agg_bookings.capacity.median()
```

Out[42]:
```
np.float64(25.0)
```

In [96]:
```
df_agg_bookings['capacity'] = df_agg_bookings['capacity'].fillna(df_agg_book
```

In [44]:
```
df_agg_bookings.loc[[8,14]]
```

Out[44]:

	property_id	check_in_date	room_category	successful_bookings	capacity
8	17561	1-May-22	RT1	22	25.0
14	17562	1-May-22	RT1	12	25.0

Exercise-2. In aggregate bookings find out records that have successful_bookings value greater than capacity. Filter those records

In [45]:
```
# write your code here
df_agg_bookings[df_agg_bookings.successful_bookings>df_agg_bookings.capacity
```

Out[45]:

	property_id	check_in_date	room_category	successful_bookings	capaci
3	17558	1-May-22	RT1	30	19
12	16563	1-May-22	RT1	100	41
4136	19558	11-Jun-22	RT2	50	39
6209	19560	2-Jul-22	RT1	123	26
8522	19559	25-Jul-22	RT1	35	24
9194	18563	31-Jul-22	RT4	20	18

In [46]:
```
df_agg_bookings.shape
```

Out[46]:
```
(9200, 5)
```

In [47]:
```
df_agg_bookings = df_agg_bookings[df_agg_bookings.successful_bookings<=df_ag
df_agg_bookings.shape
```

Out[47]:
```
(9194, 5)
```

==> 3. Data Transformation

Create occupancy percentage column

In [48]:
```
df_agg_bookings.head(3)
```

Out[48]:

	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 [49]: df_agg_bookings['occ_pct'] = df_agg_bookings.apply(lambda row: row['successf
```

You can use following approach to get rid of SettingWithCopyWarning

```
In [50]: new_col = df_agg_bookings.apply(lambda row: row['successful_bookings']/row['
         df_agg_bookings = df_agg_bookings.assign(occ_pct=new_col.values)
         df_agg_bookings.head(3)
```

Out[50]:

	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

Convert it to a percentage value

```
In [51]: df_agg_bookings['occ_pct'] = df_agg_bookings['occ_pct'].apply(lambda x: rour
         df_agg_bookings.head(3)
```

Out[51]:

	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 [52]: df_bookings.head()
```

Out[52]:

	booking_id	property_id	booking_date	check_in_date	checkout_dat
1	May012216558RT12	16558	30-04-22	1/5/2022	2/5/202
4	May012216558RT15	16558	27-04-22	1/5/2022	2/5/202
5	May012216558RT16	16558	1/5/2022	1/5/2022	3/5/202
6	May012216558RT17	16558	28-04-22	1/5/2022	6/5/202
7	May012216558RT18	16558	26-04-22	1/5/2022	3/5/202

```
In [53]: 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 [54]:
```
df_agg_bookings.head(3)
```

Out[54]:

	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 [55]:
```
df_agg_bookings.groupby("room_category")["occ_pct"].mean()
```

Out[55]:
```
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 [56]:
```
df = pd.merge(df_agg_bookings, df_rooms, left_on="room_category", right_on="
df.head(4)
```

Out[56]:

	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
3	16558	1-May-22	RT1	18	19.0

In [57]:
```
df.drop("room_id",axis=1, inplace=True)
df.head(4)
```

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
3	16558	1-May-22	RT1	18	19.0

In [58]:
```
df.groupby("room_class")["occ_pct"].mean()
```

Out[58]:
```
room_class
Elite           58.009756
Premium         58.028213
Presidential    59.277925
Standard        57.889643
Name: occ_pct, dtype: float64
```

In [59]:
```
df[df.room_class=="Standard"].occ_pct.mean()
```

Out[59]:
```
np.float64(57.88964285714285)
```

2. Print average occupancy rate per city

In [60]:
```
df_hotels.head(3)
```

Out[60]:

	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 [61]:
```
df = pd.merge(df, df_hotels, on="property_id")
df.head(3)
```

Out[61]:

	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 [62]:
```
df.groupby("city")["occ_pct"].mean()
```

Out[62]:
```
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 [63]:
```
df_date.head(3)
```

Out[63]:

	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 [64]:
```
df = pd.merge(df, df_date, left_on="check_in_date", right_on="date")
df.head(3)
```

Out[64]:

	property_id	check_in_date	room_category	successful_bookings	capacity
0	19563	10-May-22	RT3	15	29.0
1	18560	10-May-22	RT1	19	30.0
2	19562	10-May-22	RT1	18	30.0

In [65]:
```
df.groupby("day_type")["occ_pct"].mean().round(2)
```

Out[65]:
```
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 [66]:
```
df_june_22 = df[df["mmm yy"]=="Jun 22"]
df_june_22.head(4)
```

Out[66]:

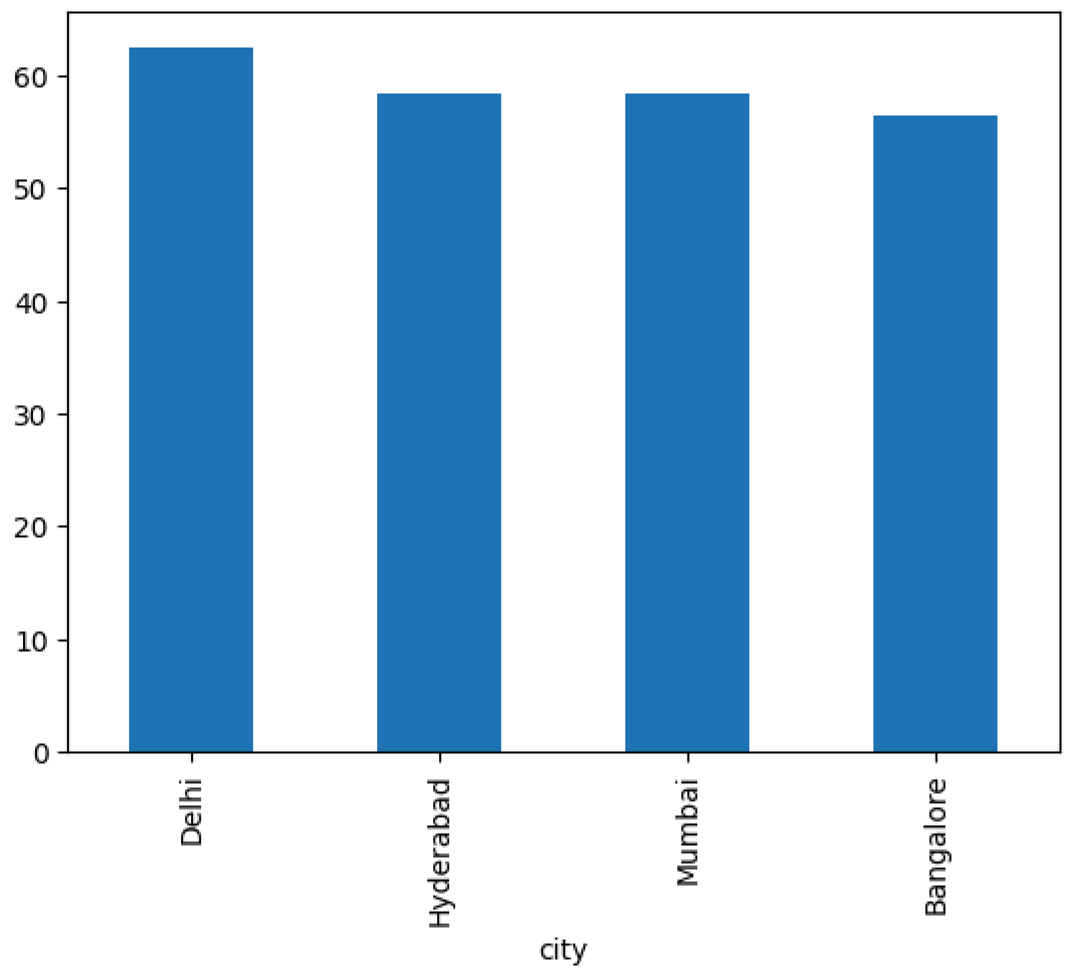
	property_id	check_in_date	room_category	successful_bookings	capaci
2200	16559	10-Jun-22	RT1	20	3C
2201	19562	10-Jun-22	RT1	19	3C
2202	19563	10-Jun-22	RT1	17	3C
2203	17558	10-Jun-22	RT1	9	19

In [67]:
```
df_june_22.groupby('city')['occ_pct'].mean().round(2).sort_values(ascending=
```

Out[67]:
```
city
Delhi        62.47
Hyderabad    58.46
Mumbai       58.38
Bangalore    56.44
Name: occ_pct, dtype: float64
```

In [68]:
```
df_june_22.groupby('city')['occ_pct'].mean().round(2).sort_values(ascending=
```

Out[68]:
```
<Axes: xlabel='city'>
```



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

```
In [69]: df_august = pd.read_csv("datasets/new_data_august.csv")
         df_august.head(3)
```

Out[69]:

	property_id	property_name	category	city	room_category	room_clas
0	16559	Atliq Exotica	Luxury	Mumbai	RT1	Standar
1	19562	Atliq Bay	Luxury	Bangalore	RT1	Standar
2	19563	Atliq Palace	Business	Bangalore	RT1	Standar

```
In [70]: df_august.columns
```

```
Out[70]: 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 [71]:
```
df.columns
```

Out[71]:
```
Index(['property_id', 'check_in_date', 'room_category', 'successful_booking
s',
       'capacity', 'occ_pct', 'room_class', 'property_name', 'category',
       'city', 'date', 'mmm yy', 'week no', 'day_type'],
      dtype='object')
```

In [72]:
```
df_august.shape
```

Out[72]:
```
(7, 13)
```

In [73]:
```
df.shape
```

Out[73]:
```
(6497, 14)
```

In [74]:
```
latest_df = pd.concat([df, df_august], ignore_index = True, axis = 0)
latest_df.tail(10)
```

Out[74]:

	property_id	check_in_date	room_category	successful_bookings	capaci
6494	17558	31-Jul-22	RT4	3	6
6495	19563	31-Jul-22	RT4	3	6
6496	17561	31-Jul-22	RT4	3	4
6497	16559	01-Aug-22	RT1	30	30
6498	19562	01-Aug-22	RT1	21	30
6499	19563	01-Aug-22	RT1	23	30
6500	19558	01-Aug-22	RT1	30	40
6501	19560	01-Aug-22	RT1	20	26
6502	17561	01-Aug-22	RT1	18	26
6503	17564	01-Aug-22	RT1	10	16

In [75]:
```
latest_df.shape
```

Out[75]:
```
(6504, 15)
```

Check this post for codebasics resume project challange winner entry: https://www.linkedin.com/posts/ashishbabaria_codebasicsresumeprojectchallenge-data-powerbi-activity-6977940034414886914-dmoJ?utm_source=share&utm_medium=member_desktop

6. Print revenue realized per city

In [76]:
```
df_bookings.head()
```

Out[76]:

	booking_id	property_id	booking_date	check_in_date	checkout_dat
1	May012216558RT12	16558	30-04-22	1/5/2022	2/5/202
4	May012216558RT15	16558	27-04-22	1/5/2022	2/5/202
5	May012216558RT16	16558	1/5/2022	1/5/2022	3/5/202
6	May012216558RT17	16558	28-04-22	1/5/2022	6/5/202
7	May012216558RT18	16558	26-04-22	1/5/2022	3/5/202

In [77]:
```
df_hotels.head(3)
```

Out[77]:

	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 [78]:
```
df_bookings_all = pd.merge(df_bookings, df_hotels, on="property_id")
df_bookings_all.head(3)
```

Out[78]:

	booking_id	property_id	booking_date	check_in_date	checkout_dat
0	May012216558RT12	16558	30-04-22	1/5/2022	2/5/202
1	May012216558RT15	16558	27-04-22	1/5/2022	2/5/202
2	May012216558RT16	16558	1/5/2022	1/5/2022	3/5/202

In [79]:
```
df_bookings_all.groupby("city")["revenue_realized"].sum()
```

Out[79]:
```
city
Bangalore    420383550
Delhi        294404488
Hyderabad    325179310
Mumbai       668569251
Name: revenue_realized, dtype: int64
```

7. Print month by month revenue

In [80]:
```
df_date.head(3)
```

Out[80]:

	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 [81]:
```
df_date["mmm yy"].unique()
```

Out[81]:
```
array(['May 22', 'Jun 22', 'Jul 22'], dtype=object)
```

In [82]:
```
df_bookings_all.head(3)
```

Out[82]:

	booking_id	property_id	booking_date	check_in_date	checkout_dat
0	May012216558RT12	16558	30-04-22	1/5/2022	2/5/202
1	May012216558RT15	16558	27-04-22	1/5/2022	2/5/202
2	May012216558RT16	16558	1/5/2022	1/5/2022	3/5/202

In [83]:
```
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 [95]:
```
df_date["date"] = pd.to_datetime(df_date["date"])
df_date.head(3)
```

Out[95]:

	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 [85]:
```
df_bookings_all.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 134573 entries, 0 to 134572
Data columns (total 15 columns):
 #   Column             Non-Null Count   Dtype  
---  ------             --------------   -----  
 0   booking_id         134573 non-null  object 
 1   property_id        134573 non-null  int64  
 2   booking_date       134573 non-null  object 
 3   check_in_date      134573 non-null  object 
 4   checkout_date      134573 non-null  object 
 5   no_guests          134573 non-null  float64
 6   room_category      134573 non-null  object 
 7   booking_platform   134573 non-null  object 
 8   ratings_given      56676 non-null   float64
 9   booking_status     134573 non-null  object 
 10  revenue_generated  134573 non-null  int64  
 11  revenue_realized   134573 non-null  int64  
 12  property_name      134573 non-null  object 
 13  category           134573 non-null  object 
 14  city               134573 non-null  object 
dtypes: float64(2), int64(3), object(10)
memory usage: 15.4+ MB
```

In [86]:
```python
df_bookings_all["check_in_date"] = pd.to_datetime(df_bookings_all["check_in_
df_bookings_all.head(4)
```

Out[86]:

	booking_id	property_id	booking_date	check_in_date	checkout_dat
0	May012216558RT12	16558	30-04-22	2022-05-01	2/5/202
1	May012216558RT15	16558	27-04-22	2022-05-01	2/5/202
2	May012216558RT16	16558	1/5/2022	2022-05-01	3/5/202
3	May012216558RT17	16558	28-04-22	2022-05-01	6/5/202

In [87]:
```python
df_bookings_all = pd.merge(df_bookings_all, df_date, left_on="check_in_date"
df_bookings_all.head(3)
```

Out[87]:

	booking_id	property_id	booking_date	check_in_date	checkout_dat
0	May012216558RT12	16558	30-04-22	2022-05-01	2/5/202
1	May012216558RT15	16558	27-04-22	2022-05-01	2/5/202
2	May012216558RT16	16558	1/5/2022	2022-05-01	3/5/202

In [88]:
```python
df_bookings_all.groupby("mmm yy")["revenue_realized"].sum()
```

```
Out[88]: mmm yy
         Jul 22    243180932
         Jun 22    229637640
         May 22    234353183
         Name: revenue_realized, dtype: int64
```

Exercise-1. Print revenue realized per hotel type

```
In [89]: # write your code here
         df_bookings_all.property_name.unique()
```

```
Out[89]: array(['Atliq Grands', 'Atliq Exotica', 'Atliq City', 'Atliq Blu',
                'Atliq Bay', 'Atliq Palace', 'Atliq Seasons'], dtype=object)
```

```
In [90]: df_bookings_all.groupby("property_name")["revenue_realized"].sum().round(2).
```

```
Out[90]: property_name
         Atliq Exotica    133619226
         Atliq Palace     125553143
         Atliq City       118290783
         Atliq Blu        108108129
         Atliq Bay        107516312
         Atliq Grands      87245939
         Atliq Seasons     26838223
         Name: revenue_realized, dtype: int64
```

Exercise-2 Print average rating per city

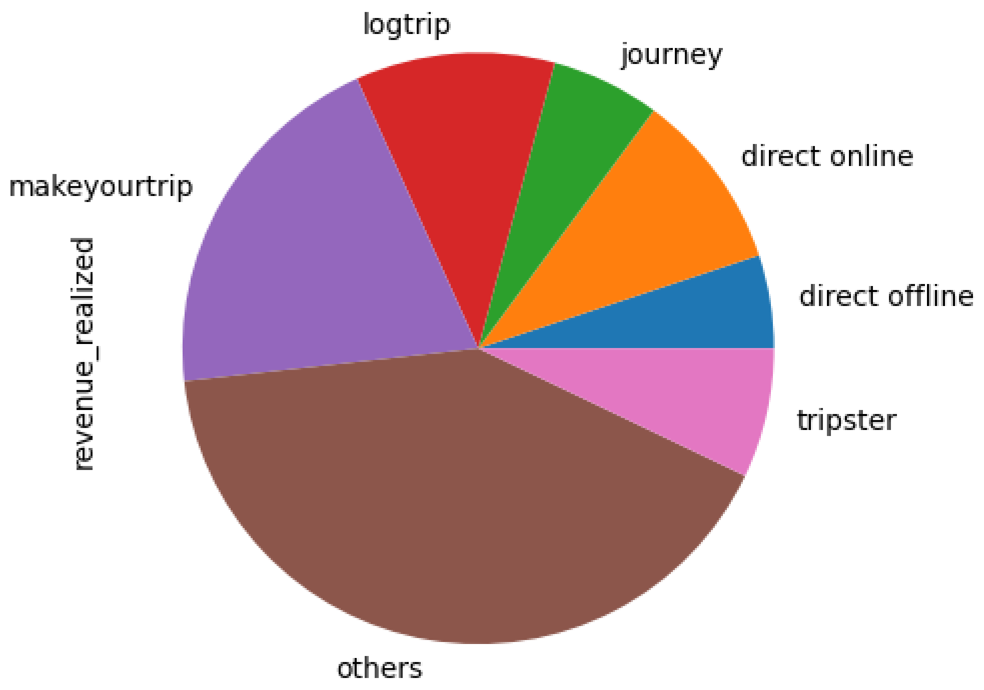
```
In [91]: # write your code here
         df_bookings_all.groupby("city")["ratings_given"].mean().round(2).sort_values
```

```
Out[91]: city
         Delhi        3.79
         Mumbai       3.66
         Hyderabad    3.65
         Bangalore    3.41
         Name: ratings_given, dtype: float64
```

Exercise-3 Print a pie chart of revenue realized per booking platform

```
In [92]: # write your code here
         df_bookings_all.groupby("booking_platform")["revenue_realized"].sum().plot(k
```

```
Out[92]: <Axes: ylabel='revenue_realized'>
```


logtrip
journey
direct online
makeyourtrip
revenue_realized
direct offline
tripster
others