AtliQ Hotels Data Analysis Project

Problem Statement

Atliq Grands, a hotel chain operating across multiple cities in India, is currently encountering stiff competition within its segment, resulting in a decline in revenue and market share.To turn things around, they want to analyze data from May 2022 to June 2022.The primary goal is to utilize Python's built-in libraries to extract valuable insights from provided datasets, focusing on aspects such as ratings, realized revenue, occupancy percentage, and other metrics.

1. Exploratory Data Analysis

In [754…
```
import pandas as pd
from matplotlib import pyplot as plt
```

In [755…
```
df_bookings = pd.read_csv('fact_bookings.csv')
df_date = pd.read_csv('dim_date.csv')
df_hotels = pd.read_csv('dim_hotels.csv')
df_rooms = pd.read_csv('dim_rooms.csv')
df_agg_bookings = pd.read_csv('fact_aggregated_bookings.csv')
```

Exploring Booking Dataset

In [756…
```
df_bookings.head()
```

Out[756…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests	room_cat
0	May012216558RT11	16558	27-04-22	1/5/2022	2/5/2022	-3.0	
1	May012216558RT12	16558	30-04-22	1/5/2022	2/5/2022	2.0	
2	May012216558RT13	16558	28-04-22	1/5/2022	4/5/2022	2.0	
3	May012216558RT14	16558	28-04-22	1/5/2022	2/5/2022	-2.0	
4	May012216558RT15	16558	27-04-22	1/5/2022	2/5/2022	4.0	

In [757…
```
df_bookings.shape
```

Out[757…
```
(134590, 12)
```

In [758…
```
df_bookings.room_category.unique()
```

Out[758…
```
array(['RT1', 'RT2', 'RT3', 'RT4'], dtype=object)
```

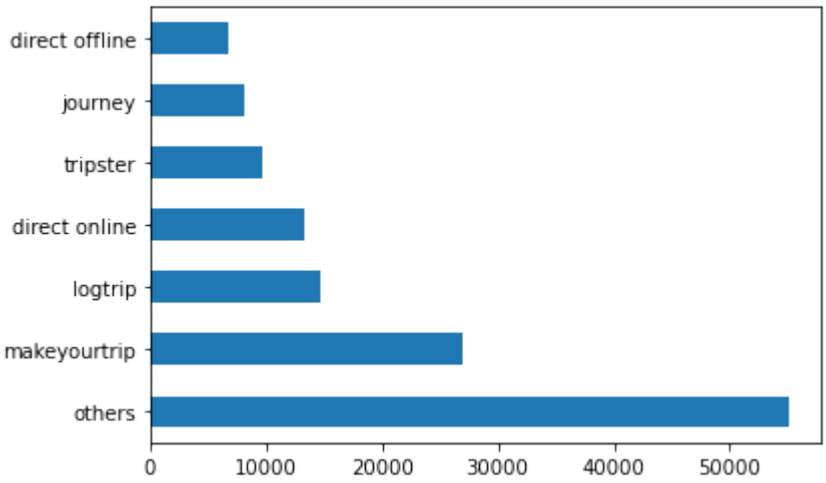
In [759…
```
df_bookings.booking_platform.unique()
```

Out[759…
```
array(['direct online', 'others', 'logtrip', 'tripster', 'makeyourtrip',
       'journey', 'direct offline'], dtype=object)
```

In [760…
```
df_bookings.booking_platform.value_counts()
```

Out[760…
```
others            55066
makeyourtrip      26898
logtrip           14756
direct online     13379
tripster           9630
journey            8106
direct offline     6755
Name: booking_platform, dtype: int64
```

In [761…
```
df_bookings.booking_platform.value_counts().plot(kind = 'barh')
plt.show()
```



In [762…
```
df_bookings.describe()
```

Out[762…

	property_id	no_guests	ratings_given	revenue_generated	revenue_realized
count	134590.000000	134587.000000	56683.000000	1.345900e+05	134590.000000
mean	18061.113493	2.036170	3.619004	1.537805e+04	12696.123256
std	1093.055847	1.034885	1.235009	9.303604e+04	6928.108124
min	16558.000000	-17.000000	1.000000	6.500000e+03	2600.000000
25%	17558.000000	1.000000	3.000000	9.900000e+03	7600.000000
50%	17564.000000	2.000000	4.000000	1.350000e+04	11700.000000
75%	18563.000000	2.000000	5.000000	1.800000e+04	15300.000000
max	19563.000000	6.000000	5.000000	2.856000e+07	45220.000000

Exploring Hotels Dataset

In [763…
```
df_hotels.head()
```

Out[763…

	property_id	property_name	category	city
0	16558	Atliq Grands	Luxury	Delhi

	property_id	property_name	category	city
1	16559	Atliq Exotica	Luxury	Mumbai
2	16560	Atliq City	Business	Delhi
3	16561	Atliq Blu	Luxury	Delhi
4	16562	Atliq Bay	Luxury	Delhi

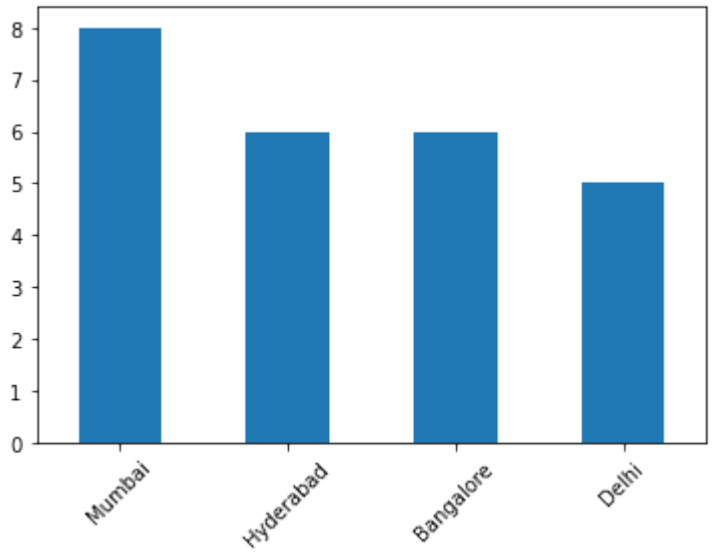
In [764…
```
df_hotels.category.value_counts()
```

Out[764…
```
Luxury      16
Business     9
Name: category, dtype: int64
```

In [765…
```
df_hotels.shape
```

Out[765…
```
(25, 4)
```

In [766…
```
df_hotels.city.value_counts().sort_values(ascending =False).plot(kind = 'bar')
plt.xticks(rotation = 45)
plt.show()
```



Exploring Date Dataset

In [767…
```
df_date.head()
```

Out[767…

	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
3	04-May-22	May 22	W 19	weekeday
4	05-May-22	May 22	W 19	weekeday

In [768…
```
df_date.shape
```

Out[768… (92, 4)

Exploring Rooms Dataset

In [769…
```
df_rooms.head()
```

Out[769…

	room_id	room_class
0	RT1	Standard
1	RT2	Elite
2	RT3	Premium
3	RT4	Presidential

In [770…
```
df_rooms.shape
```

Out[770… (4, 2)

Exploring Aggregate Bookings Dataset

In [771…
```
df_agg_bookings.head()
```

Out[771…

	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	17558	1-May-22	RT1	30	19.0
4	16558	1-May-22	RT1	18	19.0

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

In [772…
```
df_agg_bookings.property_id.unique()
```

Out[772…
```
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)
```

Exercise-2. Find out total bookings per property_id

In [773…
```
property_calc = df_agg_bookings.groupby('property_id')
property_calc['successful_bookings'].sum()
```

Out[773…
```
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 [774…

```
df_agg_bookings[(df_agg_bookings.successful_bookings > df_agg_bookings.capacity)]
```

Out[774…

	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

Exercise-4. Find out properties that have highest capacity

In [775…

```
df_agg_bookings[df_agg_bookings.capacity == df_agg_bookings.capacity.max()]
```

Out[775…

	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

In [776…

```
df_bookings.describe() #Cleaning invalid no_of_guests
```

Out[776…

	property_id	no_guests	ratings_given	revenue_generated	revenue_realized
count	134590.000000	134587.000000	56683.000000	1.345900e+05	134590.000000
mean	18061.113493	2.036170	3.619004	1.537805e+04	12696.123256
std	1093.055847	1.034885	1.235009	9.303604e+04	6928.108124
min	16558.000000	-17.000000	1.000000	6.500000e+03	2600.000000
25%	17558.000000	1.000000	3.000000	9.900000e+03	7600.000000
50%	17564.000000	2.000000	4.000000	1.350000e+04	11700.000000
75%	18563.000000	2.000000	5.000000	1.800000e+04	15300.000000
max	19563.000000	6.000000	5.000000	2.856000e+07	45220.000000

In [777…

```
df_bookings.shape
```

Out[777…

```
(134590, 12)
```

In [778…

```
df_bookings[df_bookings.no_guests < 0 ]
```

Out[778…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests	ro
0	May012216558RT11	16558	27-04-22	1/5/2022	2/5/2022	-3.0	
3	May012216558RT14	16558	28-04-22	1/5/2022	2/5/2022	-2.0	
17924	May122218559RT44	18559	12/5/2022	12/5/2022	14-05-22	-10.0	

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests	ro
18020	May122218561RT22	18561	8/5/2022	12/5/2022	14-05-22	-12.0	
18119	May122218562RT311	18562	5/5/2022	12/5/2022	17-05-22	-6.0	
18121	May122218562RT313	18562	10/5/2022	12/5/2022	17-05-22	-4.0	
56715	Jun082218562RT12	18562	5/6/2022	8/6/2022	13-06-22	-17.0	
119765	Jul202219560RT220	19560	19-07-22	20-07-22	22-07-22	-1.0	
134586	Jul312217564RT47	17564	30-07-22	31-07-22	1/8/2022	-4.0	

In [779…
```
df_bookings= df_bookings[df_bookings.no_guests> 0 ] #to only include no_of_guests wh
```

In [780…
```
df_bookings.shape #invalid guests removed
```

Out[780…
```
(134578, 12)
```

In [781…
```
df_bookings.revenue_generated.min(),df_bookings.revenue_generated.max() #max value c
```

Out[781…
```
(6500, 28560000)
```

In [782…
```
# we will use 3std for outlier removal
```

In [783…
```
mean = df_bookings.revenue_generated.mean()
std =df_bookings.revenue_generated.std()
higher_limit  = mean + 3*std
higher_limit
```

Out[783…
```
294498.50173198653
```

In [784…
```
df_bookings[df_bookings.revenue_generated > higher_limit] #invalid data
```

Out[784…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests	ro
2	May012216558RT13	16558	28-04-22	1/5/2022	4/5/2022	2.0	
111	May012216559RT32	16559	29-04-22	1/5/2022	2/5/2022	6.0	
315	May012216562RT22	16562	28-04-22	1/5/2022	4/5/2022	2.0	
562	May012217559RT118	17559	26-04-22	1/5/2022	2/5/2022	2.0	
129176	Jul282216562RT26	16562	21-07-22	28-07-22	29-07-22	2.0	

In [785…
```
df_bookings= df_bookings[df_bookings.revenue_generated < higher_limit] #removed outl
```

In [786…
```
df_bookings.shape
```

Out[786…
```
(134573, 12)
```

In [787…
```
df_bookings[df_bookings.revenue_realized == df_bookings.revenue_realized.max()]
```

Out[787…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests	ro
139	May012216559RT43	16559	1/5/2022	1/5/2022	2/5/2022	6.0	
715	May012217560RT46	17560	28-04-22	1/5/2022	2/5/2022	6.0	
719	May012217560RT410	17560	1/5/2022	1/5/2022	4/5/2022	6.0	
2107	May022216559RT47	16559	28-04-22	2/5/2022	4/5/2022	6.0	
2381	May022217558RT42	17558	25-04-22	2/5/2022	8/5/2022	6.0	
…	…	…	…	…	…	…	…
132069	Jul302217563RT414	17563	30-07-22	30-07-22	3/8/2022	6.0	
133389	Jul312217558RT42	17558	28-07-22	31-07-22	1/8/2022	6.0	
133453	Jul312217559RT45	17559	26-07-22	31-07-22	6/8/2022	6.0	
133456	Jul312217559RT48	17559	29-07-22	31-07-22	2/8/2022	6.0	
133708	Jul312217563RT413	17563	26-07-22	31-07-22	1/8/2022	6.0	

135 rows × 12 columns

Our higher limit was 294498.50173198653 but max revenue_realized = 45k this is because rt4 is presidential suite ,which is usually expensive.

In [788…
```
df_bookings[df_bookings.room_category == 'RT4'].revenue_realized.describe()
```

Out[788…
```
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 [789…
```
23439.308444 + 3*9048.599076
```

Out[789…
```
50585.105672000005
```

We can see the this method for rt4 room is giving around 50k revenue.So logically 45k for a presidential suite is valid.

In [790…
```
df_bookings.isnull().sum()
```

Out[790…
```
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
```

Ratings given has 77897 null values. But we will not do anything over here because pracically people usually tend to forget or dont give ratings when they checkout.

In [791…
```
df_agg_bookings.describe()
```

Out[791…

	property_id	successful_bookings	capacity
count	9200.000000	9200.000000	9198.000000
mean	18040.640000	14.655761	25.280496
std	1099.818325	7.736170	11.442080
min	16558.000000	1.000000	3.000000
25%	17558.000000	9.000000	18.000000
50%	17564.000000	14.000000	25.000000
75%	18563.000000	19.000000	34.000000
max	19563.000000	123.000000	50.000000

In [792…
```
df_agg_bookings.isnull().sum()
```

Out[792…
```
property_id            0
check_in_date          0
room_category          0
successful_bookings    0
capacity               2
dtype: int64
```

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 [793…
```
df_agg_bookings[df_agg_bookings.capacity.isnull() == True] #We will fill the NA valu
```

Out[793…

	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 [794…
```
df_agg_bookings.capacity.fillna(df_agg_bookings.capacity.median(),inplace = True)
```

In [795…
```
df_agg_bookings.iloc[[8,14]]
```

Out[795…

	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

In [796…

```
df_agg_bookings.isnull().sum()
```

Out[796…

```
property_id            0
check_in_date          0
room_category          0
successful_bookings    0
capacity               0
dtype: int64
```

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

In [797…

```
df_agg_bookings[df_agg_bookings.successful_bookings > df_agg_bookings.capacity]
```

Out[797…

	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 [798…

```
df_agg_bookings.shape
```

Out[798…

```
(9200, 5)
```

In [799…

```
df_agg_bookings = df_agg_bookings[df_agg_bookings.successful_bookings <= df_agg_book
```

In [800…

```
df_agg_bookings.shape
```

Out[800…

```
(9194, 5)
```

3. DATA TRANSFORMATION

Create occupancy percentage column

In [801…

```
df_agg_bookings.head()
```

Out[801…

	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

	property_id	check_in_date	room_category	successful_bookings	capacity
2	19563	1-May-22	RT1	23	30.0
4	16558	1-May-22	RT1	18	19.0
5	17560	1-May-22	RT1	28	40.0

In [802…
```
df_agg_bookings['Occupancy %'] = df_agg_bookings['successful_bookings']/df_agg_booki
```

In [803…
```
df_agg_bookings['Occupancy %'] = df_agg_bookings['Occupancy %'].apply(lambda x : rou
```

In [804…
```
df_agg_bookings.head()
```

Out[804…

	property_id	check_in_date	room_category	successful_bookings	capacity	Occupancy %
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

4. Insights Generation

1.Average occupancy rate in each of the room categories:

In [805…
```
df_occupancy = df_agg_bookings.groupby('room_category')['Occupancy %'].mean()
```

In [806…
```
df_occupancy
```

Out[806…
```
room_category
RT1    57.889643
RT2    58.009756
RT3    58.028213
RT4    59.277925
Name: Occupancy %, dtype: float64
```

In [807…
```
df_rooms.head()
```

Out[807…

	room_id	room_class
0	RT1	Standard
1	RT2	Elite
2	RT3	Premium
3	RT4	Presidential

In [808…
```
pd.merge(df_rooms,df_occupancy,left_on = 'room_id',right_on = 'room_category')
```

Out[808…

	room_id	room_class	Occupancy %
0	RT1	Standard	57.889643
1	RT2	Elite	58.009756
2	RT3	Premium	58.028213
3	RT4	Presidential	59.277925

2. Average occupancy rate per city

In [809…

```
df_agg_bookings
```

Out[809…

	property_id	check_in_date	room_category	successful_bookings	capacity	Occupancy %
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
…	…	…	…	…	…	…
9195	16563	31-Jul-22	RT4	13	18.0	72.22
9196	16559	31-Jul-22	RT4	13	18.0	72.22
9197	17558	31-Jul-22	RT4	3	6.0	50.00
9198	19563	31-Jul-22	RT4	3	6.0	50.00
9199	17561	31-Jul-22	RT4	3	4.0	75.00

9194 rows × 6 columns

In [810…

```
df_hotels.head()
```

Out[810…

	property_id	property_name	category	city
0	16558	Atliq Grands	Luxury	Delhi
1	16559	Atliq Exotica	Luxury	Mumbai
2	16560	Atliq City	Business	Delhi
3	16561	Atliq Blu	Luxury	Delhi
4	16562	Atliq Bay	Luxury	Delhi

In [811…

```
df = pd.merge(df_agg_bookings,df_hotels,on = 'property_id') #Merging since city colu
```

In [812…

```
df.head()
```

Out[812…

	property_id	check_in_date	room_category	successful_bookings	capacity	Occupancy %	property_na
0	16559	1-May-22	RT1	25	30.0	83.33	Atliq Exo
1	16559	1-May-22	RT2	35	41.0	85.37	Atliq Exo
2	16559	1-May-22	RT3	27	32.0	84.38	Atliq Exo
3	16559	1-May-22	RT4	17	18.0	94.44	Atliq Exo
4	16559	2-May-22	RT1	20	30.0	66.67	Atliq Exo

In [813…

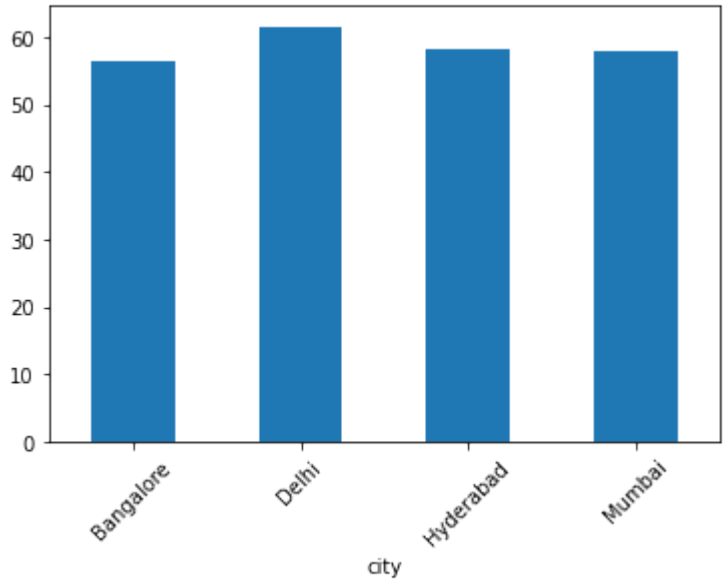
```
df.groupby('city')['Occupancy %'].mean().round(2)
```

Out[813…

```
city
Bangalore    56.33
Delhi        61.51
Hyderabad    58.12
Mumbai       57.91
Name: Occupancy %, dtype: float64
```

In [814…

```
df.groupby('city')['Occupancy %'].mean().round(2).plot(kind ='bar')
plt.xticks(rotation = 45)
plt.show()
```



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

In [815…

```
df_date.head()
```

Out[815…

	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
3	04-May-22	May 22	W 19	weekeday
4	05-May-22	May 22	W 19	weekeday

In [816…
```
df = pd.merge(df,df_date,left_on = 'check_in_date',right_on = 'date')
```

In [817…
```
df.head()
```

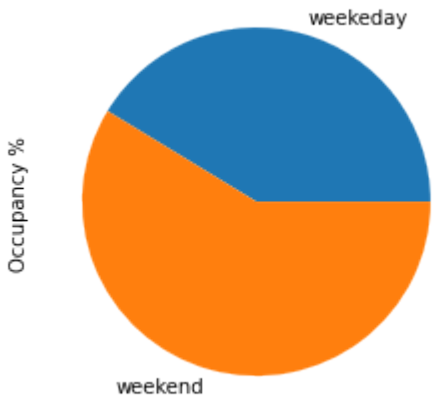
Out[817…

	property_id	check_in_date	room_category	successful_bookings	capacity	Occupancy %	property_na
0	16559	10-May-22	RT2	25	41.0	60.98	Atliq Exo
1	16559	10-May-22	RT1	18	30.0	60.00	Atliq Exo
2	16559	10-May-22	RT3	20	32.0	62.50	Atliq Exo
3	16559	10-May-22	RT4	13	18.0	72.22	Atliq Exo
4	19562	10-May-22	RT1	18	30.0	60.00	Atliq

In [818…
```
pie_df = df.groupby('day_type')['Occupancy %'].mean().round(2)
pie_df
```

Out[818…
```
day_type
weekeday    50.88
weekend     72.34
Name: Occupancy %, dtype: float64
```

In [819…
```
df.groupby('day_type')['Occupancy %'].mean().round(2).plot(kind = 'pie')
plt.show()
```



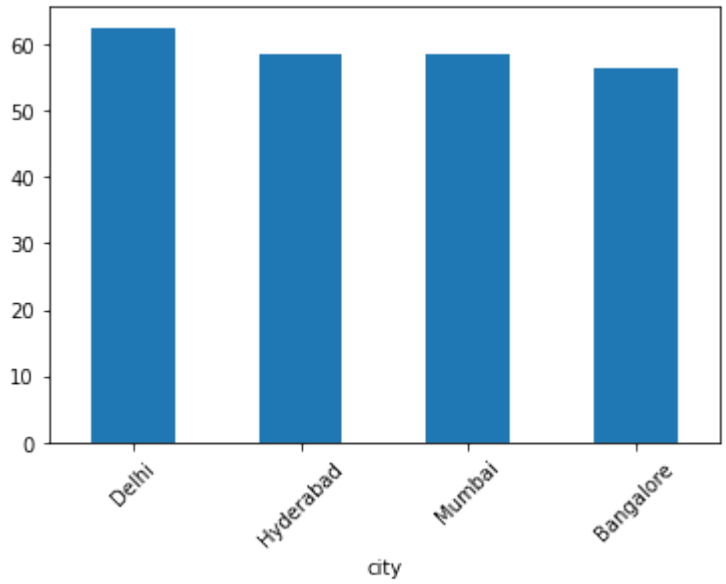
4: In the month of June, what is the occupancy for different cities

In [820…
```
df_june = df[df['mmm yy'] == 'Jun 22']
```

In [821…
```
df_june.groupby('city')['Occupancy %'].mean().round(2).sort_values(ascending = False
```

Out[821…
```
city
Delhi        62.47
Hyderabad    58.46
Mumbai       58.38
Bangalore    56.44
Name: Occupancy %, dtype: float64
```

In [822…
```
df_june.groupby('city')['Occupancy %'].mean().round(2).sort_values(ascending = False
plt.xticks(rotation = 45)
plt.show()
```



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

In [823…
```
df_august = pd.read_csv('new_data_august.csv')
```

In [824…
```
df_august
```

Out[824…

	property_id	property_name	category	city	room_category	room_class	check_in_date	mmm y
0	16559	Atliq Exotica	Luxury	Mumbai	RT1	Standard	01-Aug-22	Aug 2
1	19562	Atliq Bay	Luxury	Bangalore	RT1	Standard	01-Aug-22	Aug 2
2	19563	Atliq Palace	Business	Bangalore	RT1	Standard	01-Aug-22	Aug 2
3	19558	Atliq Grands	Luxury	Bangalore	RT1	Standard	01-Aug-22	Aug 2
4	19560	Atliq City	Business	Bangalore	RT1	Standard	01-Aug-22	Aug 2
5	17561	Atliq Blu	Luxury	Mumbai	RT1	Standard	01-Aug-22	Aug 2
6	17564	Atliq Seasons	Business	Mumbai	RT1	Standard	01-Aug-22	Aug 2

In [825…
```
latest_df = pd.concat([df,df_august],ignore_index = True)
```

In [826…
```
latest_df.tail()
```

Out[826…

	property_id	check_in_date	room_category	successful_bookings	capacity	Occupancy %	property
6499	19563	01-Aug-22	RT1	23	30.0	NaN	Atlic
6500	19558	01-Aug-22	RT1	30	40.0	NaN	Atliq
6501	19560	01-Aug-22	RT1	20	26.0	NaN	A
6502	17561	01-Aug-22	RT1	18	26.0	NaN	A
6503	17564	01-Aug-22	RT1	10	16.0	NaN	Atliq S

6. Print revenue realized per city

In [827…
```
df_bookings.head()
```

Out[827…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests	room_cat
1	May012216558RT12	16558	30-04-22	1/5/2022	2/5/2022	2.0	
4	May012216558RT15	16558	27-04-22	1/5/2022	2/5/2022	4.0	
5	May012216558RT16	16558	1/5/2022	1/5/2022	3/5/2022	2.0	
6	May012216558RT17	16558	28-04-22	1/5/2022	6/5/2022	2.0	
7	May012216558RT18	16558	26-04-22	1/5/2022	3/5/2022	2.0	

In [828…
```
df_revenue = pd.merge(df_bookings,df_hotels, on = 'property_id')
```

In [829…
```
df_revenue.head()
```

Out[829…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests	room_cat
0	May012216558RT12	16558	30-04-22	1/5/2022	2/5/2022	2.0	
1	May012216558RT15	16558	27-04-22	1/5/2022	2/5/2022	4.0	
2	May012216558RT16	16558	1/5/2022	1/5/2022	3/5/2022	2.0	
3	May012216558RT17	16558	28-04-22	1/5/2022	6/5/2022	2.0	
4	May012216558RT18	16558	26-04-22	1/5/2022	3/5/2022	2.0	

In [830…

```
df_revenue.groupby('city')['revenue_realized'].sum()
```

Out[830…

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

7.Print month by month revenue

In [831…

```
df_revenue['check_in_date'] = pd.to_datetime(df_revenue['check_in_date'])
```

In [832…

```
df_date['date'] = pd.to_datetime(df_date['date'])
```

In [833…

```
df_revenue = pd.merge(df_revenue,df_date,left_on = 'check_in_date',right_on = 'date'
```

In [835…

```
df_revenue.head()
```

Out[835…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests	room_cat
0	May052216558RT11	16558	15-04-22	2022-05-05	7/5/2022	3.0	
1	May052216558RT12	16558	30-04-22	2022-05-05	7/5/2022	2.0	
2	May052216558RT13	16558	1/5/2022	2022-05-05	6/5/2022	3.0	
3	May052216558RT14	16558	3/5/2022	2022-05-05	6/5/2022	2.0	
4	May052216558RT15	16558	30-04-22	2022-05-05	10/5/2022	4.0	

In [836…

```
df_revenue.groupby('mmm yy')['revenue_realized'].sum()
```

Out[836…

```
mmm yy
Jul 22    389940912
Jun 22    377191229
```

```
May 22    408375641
Name: revenue_realized, dtype: int64
```

8. Print revenue realized per hotel type

In [837…

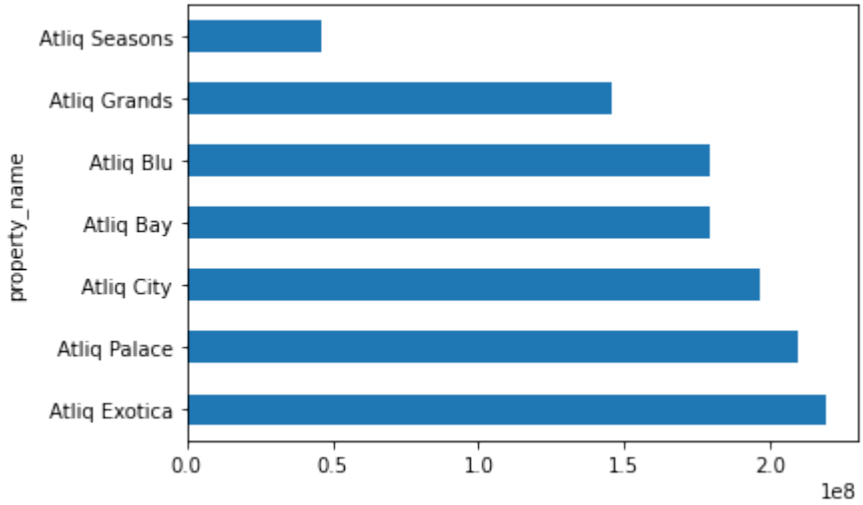
```
df_revenue.groupby('property_name')['revenue_realized'].sum().sort_values(ascending
```

Out[837…

```
property_name
Atliq Exotica    219076161
Atliq Palace     209474575
Atliq City       196555383
Atliq Bay        179416721
Atliq Blu        179203544
Atliq Grands     145860641
Atliq Seasons     45920757
Name: revenue_realized, dtype: int64
```

In [840…

```
df_revenue.groupby('property_name')['revenue_realized'].sum().sort_values(ascending
plt.show()
```



9. Print average rating per city

In [841…

```
df_revenue.groupby('city')['ratings_given'].mean().round(2)
```

Out[841…

```
city
Bangalore    3.40
Delhi        3.78
Hyderabad    3.66
Mumbai       3.64
Name: ratings_given, dtype: float64
```

10. Print a pie chart of revenue realized per booking platform

In [842…

```
df_pie = df_revenue.groupby('booking_platform')['revenue_realized'].sum()
df_pie
```

Out[842…

```
booking_platform
direct offline     59298844
direct online     117245053
journey            71231599
logtrip           129036321
makeyourtrip      233132708
others            480698244
tripster           84865013
Name: revenue_realized, dtype: int64
```

In [843…

```
plt.pie(df_pie,labels = ['direct offline','direct online','journey','logtrip','makey
plt.show()
```