AtliQ Hotels Data Analysis Project

In [421…
```
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

Reading bookings data

In [422…
```
df_bookings = pd.read_csv('datasets/fact_bookings.csv')
```

Exploring bookings data

In [423…
```
df_bookings.head()
```

Out[423…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
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 [424…
```
df_bookings.shape
```

Out[424…
```
(134590, 12)
```

In [425…
```
df_bookings.room_category.unique()
```

Out[425…

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

In [426…

```
df_bookings.booking_platform.unique()
```

Out[426…

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

In [427…

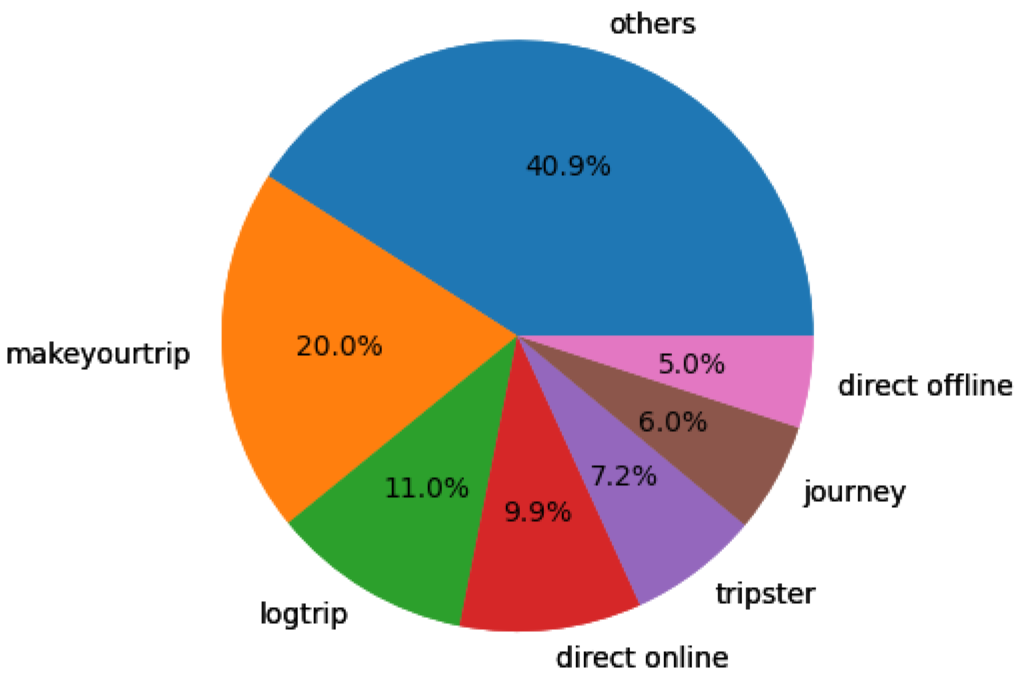
```
df_bookings.booking_platform.value_counts()
```

Out[427…

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

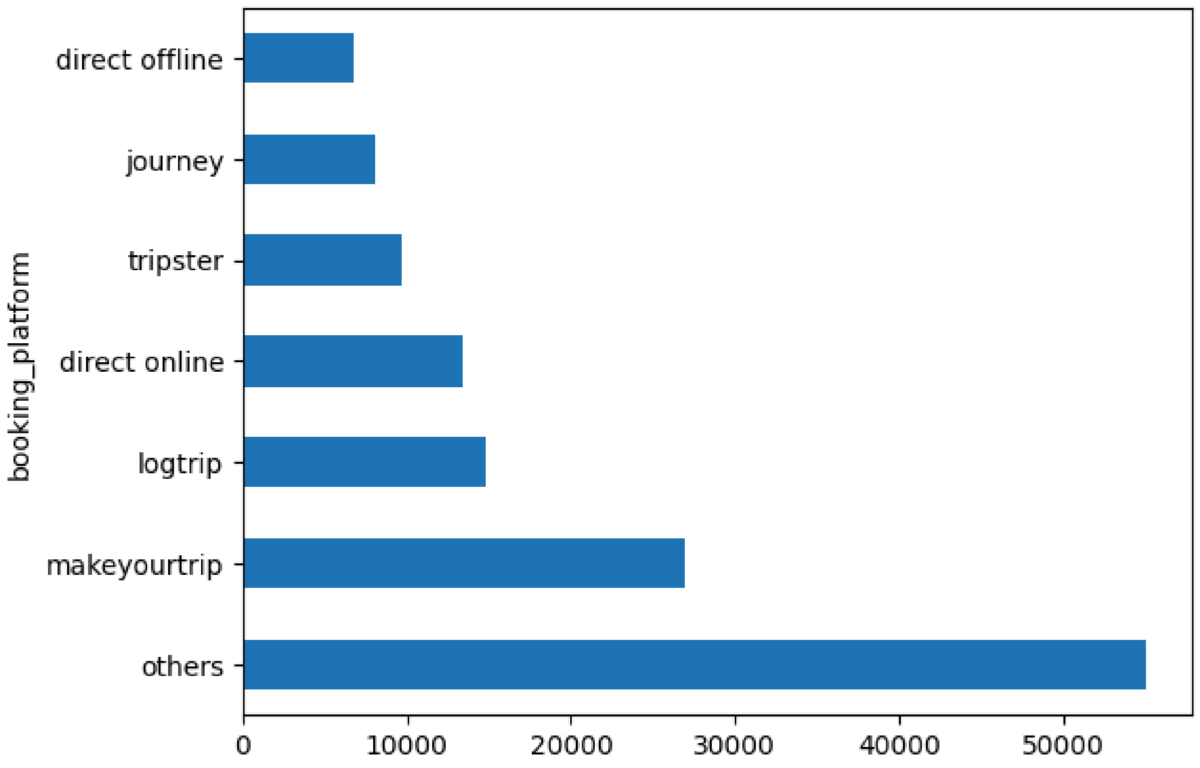
In [428…

```
from matplotlib import pyplot as plt
df_bookings.booking_platform.value_counts().plot(kind="pie")
counts = df_bookings.booking_platform.value_counts()
counts.plot(kind="pie", autopct='%1.1f%%')
plt.ylabel("")
plt.show()
```



In [429…

```
df_bookings.booking_platform.value_counts().plot(kind="barh")
plt.show()
```



```
In [430…  df_bookings.describe()
```

Out[430…

	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

Reading rest of the files

```
In [431…  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 [432…  df_hotels.shape
```

```
Out[432…  (25, 4)
```

In [433…

```
df_hotels.head(3)
```

Out[433…

	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 [434…

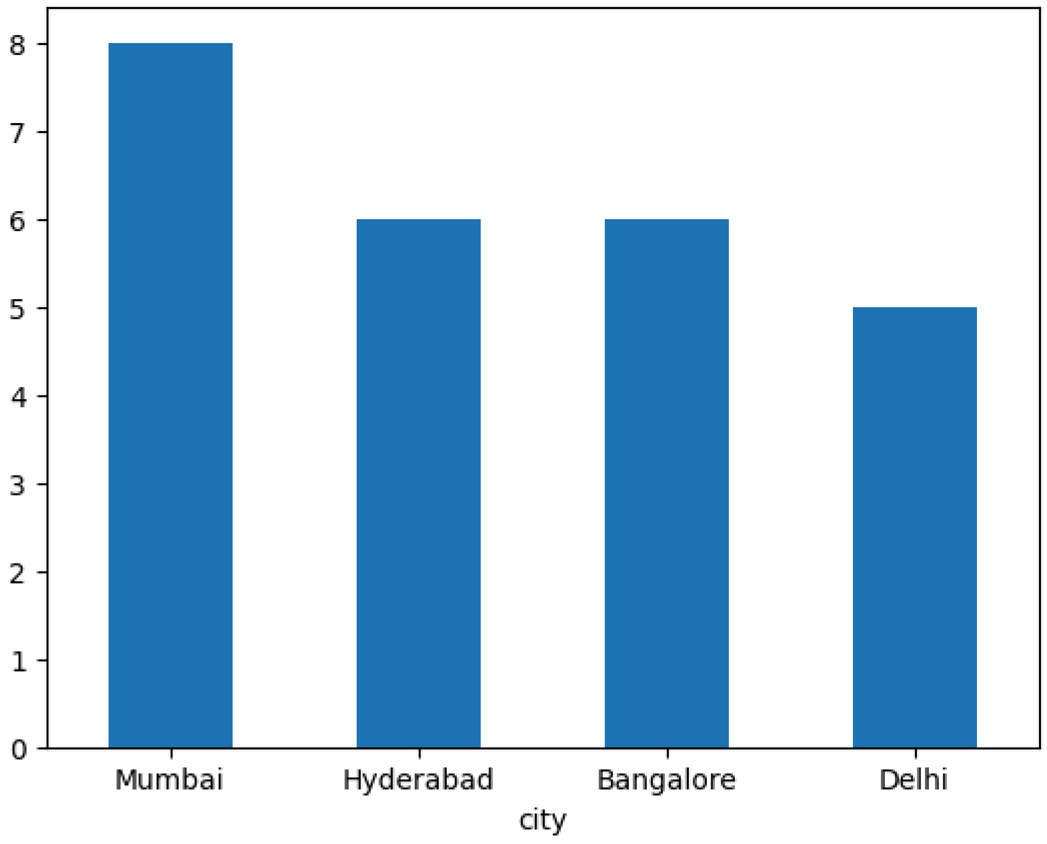
```
df_hotels.category.value_counts()
```

Out[434…

```
category
Luxury      16
Business     9
Name: count, dtype: int64
```

In [435…

```
df_hotels.city.value_counts().plot(kind="bar")
plt.xticks(rotation=0)
plt.show()
```



Exercise: Exploring aggregate bookings

In [436…

```
df_agg_bookings.head(3)
```

Out[436…

	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 [437…

```
# write your code here
df_agg_bookings.property_id.unique()
```

Out[437…

```
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 [438…

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

Out[438…

```
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 [439…

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

Out[439…

	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 [440…

```
# write your code here
Highest_capacity_prperties=df_agg_bookings[df_agg_bookings['capacity']==df_agg_book
Highest_capacity_prperties
```

Out[440…

	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 [441…

```
df_bookings.describe()
```

Out[441...

	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

(1) Cleaning invalid guests

In [442...

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

Out[442...

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_
0	May012216558RT11	16558	27-04-22	1/5/2022	2/5/2022	
3	May012216558RT14	16558	28-04-22	1/5/2022	2/5/2022	
17924	May122218559RT44	18559	12/5/2022	12/5/2022	14-05-22	
18020	May122218561RT22	18561	8/5/2022	12/5/2022	14-05-22	
18119	May122218562RT311	18562	5/5/2022	12/5/2022	17-05-22	
18121	May122218562RT313	18562	10/5/2022	12/5/2022	17-05-22	
56715	Jun082218562RT12	18562	5/6/2022	8/6/2022	13-06-22	
119765	Jul202219560RT220	19560	19-07-22	20-07-22	22-07-22	
134586	Jul312217564RT47	17564	30-07-22	31-07-22	1/8/2022	

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

In [443...

```
df_bookings = df_bookings[df_bookings.no_guests>0]
```

In [444...

```
df_bookings.shape
```

Out[444...

```
(134578, 12)
```

(2) Outlier removal in revenue generated

In [445...

```
df_bookings.revenue_generated.min(), df_bookings.revenue_generated.max()
```

Out[445…
```
(np.int64(6500), np.int64(28560000))
```

In [446…
```
df_bookings.revenue_generated.mean(), df_bookings.revenue_generated.median()
```

Out[446…
```
(np.float64(15378.036937686695), np.float64(13500.0))
```

In [447…
```
avg, std = df_bookings.revenue_generated.mean(), df_bookings.revenue_generated.std(
```

In [448…
```
higher_limit = avg + 3*std
higher_limit
```

Out[448…
```
np.float64(294498.50173207896)
```

In [449…
```
lower_limit = avg - 3*std
lower_limit
```

Out[449…
```
np.float64(-263742.4278567056)
```

In [450…
```
df_bookings[df_bookings.revenue_generated<=0]
```

Out[450…

booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests	room_c

In [451…
```
df_bookings[df_bookings.revenue_generated>higher_limit]
```

Out[451…

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

In [452…
```
df_bookings = df_bookings[df_bookings.revenue_generated<=higher_limit]
df_bookings.shape
```

Out[452…
```
(134573, 12)
```

In [453…
```
df_bookings.revenue_realized.describe()
```

Out[453…
```
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 [454…
```
higher_limit = df_bookings.revenue_realized.mean() + 3*df_bookings.revenue_realized
higher_limit
```

Out[454…
```
np.float64(33479.358661845814)
```

In [455…
```
df_bookings[df_bookings.revenue_realized>higher_limit]
```

Out[455…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_
137	May012216559RT41	16559	27-04-22	1/5/2022	7/5/2022	
139	May012216559RT43	16559	1/5/2022	1/5/2022	2/5/2022	
143	May012216559RT47	16559	28-04-22	1/5/2022	3/5/2022	
149	May012216559RT413	16559	24-04-22	1/5/2022	7/5/2022	
222	May012216560RT45	16560	30-04-22	1/5/2022	3/5/2022	
...	...	...	...	...	...	
134328	Jul312219560RT49	19560	31-07-22	31-07-22	2/8/2022	
134331	Jul312219560RT412	19560	31-07-22	31-07-22	1/8/2022	
134467	Jul312219562RT45	19562	28-07-22	31-07-22	1/8/2022	
134474	Jul312219562RT412	19562	25-07-22	31-07-22	6/8/2022	
134581	Jul312217564RT42	17564	31-07-22	31-07-22	1/8/2022	

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 [456…
```
df_bookings[df_bookings.room_category=="RT4"].revenue_realized.describe()
```

Out[456…
```
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 [457…
```
# mean + 3*standard deviation
23439+3*9048
```

Out[457…
```
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 [458…
```
df_bookings.isnull().sum()
```

Out[458…
```
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 77897 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

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 [459…
```
df_agg_bookings.isnull().sum()
```

Out[459…
```
property_id            0
check_in_date          0
room_category          0
successful_bookings    0
capacity               2
dtype: int64
```

In [460…
```
# write your cod
df_agg_bookings[df_agg_bookings.capacity.isna()]
```

Out[460…

	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 [461…
```
df_agg_bookings.capacity.median()
```

Out[461…
```
np.float64(25.0)
```

In [462…
```
df_agg_bookings['capacity'] = df_agg_bookings['capacity'].fillna(df_agg_bookings['c
```

In [463…
```
df_agg_bookings.loc[[8,14]]
```

Out[463…

	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 [464…
```
# write your code here
df_agg_bookings[df_agg_bookings.successful_bookings>df_agg_bookings.capacity]
```

Out[464…

	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 [465…
```
df_agg_bookings.shape
```

Out[465…
```
(9200, 5)
```

In [466…
```
df_agg_bookings=df_agg_bookings[df_agg_bookings.successful_bookings<=df_agg_booking
```

In [467…
```
df_agg_bookings.shape
```

Out[467…
```
(9194, 5)
```

==> 3. Data Transformation

Create occupancy percentage column

In [468…

```
df_agg_bookings.head(3)
```

Out[468…

	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 [469…

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

Out[469…

	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 [470…

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

Out[470…

	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 [471…

```
df_bookings.head()
```

Out[471…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
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 [472…

```
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
```

==> 4. Insights Generation

---

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

In [473…

```
df_agg_bookings.head(3)
```

Out[473…

	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 [474…

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

Out[474…

```
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 [475…
```
df = pd.merge(df_agg_bookings, df_rooms, left_on="room_category", right_on="room_id
df.head(4)
```

Out[475…

	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 [476…
```
df.drop("room_id",axis=1, inplace=True)
df.head(4)
```

Out[476…

	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 [477…
```
df.groupby("room_class")["occ_pct"].mean()
```

Out[477…
```
room_class
Elite           58.009756
Premium         58.028213
Presidential    59.277925
Standard        57.889643
Name: occ_pct, dtype: float64
```

In [478…
```
df[df.room_class=="Standard"].occ_pct.mean()
```

Out[478…
```
np.float64(57.88964285714285)
```

2. Print average occupancy rate per city

In [479…
```
df_hotels.head(3)
```

Out[479…

	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 [480…

```
df = pd.merge(df, df_hotels, on="property_id")
df.head(3)
```

Out[480…

	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

In [481…

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

Out[481…

```
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 [482…

```
df_date.head(3)
```

Out[482…

	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 [483…

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

Out[483…

	property_id	check_in_date	room_category	successful_bookings	capacity	occ_pct	roon
0	19563	10-May-22	RT3	15	29.0	51.72	Pr
1	18560	10-May-22	RT1	19	30.0	63.33	St
2	19562	10-May-22	RT1	18	30.0	60.00	St

In [484…

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

Out[484…

```
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 [485…

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

Out[485…

	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	19562	10-Jun-22	RT1	19	30.0	63.33	
2202	19563	10-Jun-22	RT1	17	30.0	56.67	
2203	17558	10-Jun-22	RT1	9	19.0	47.37	

In [486…

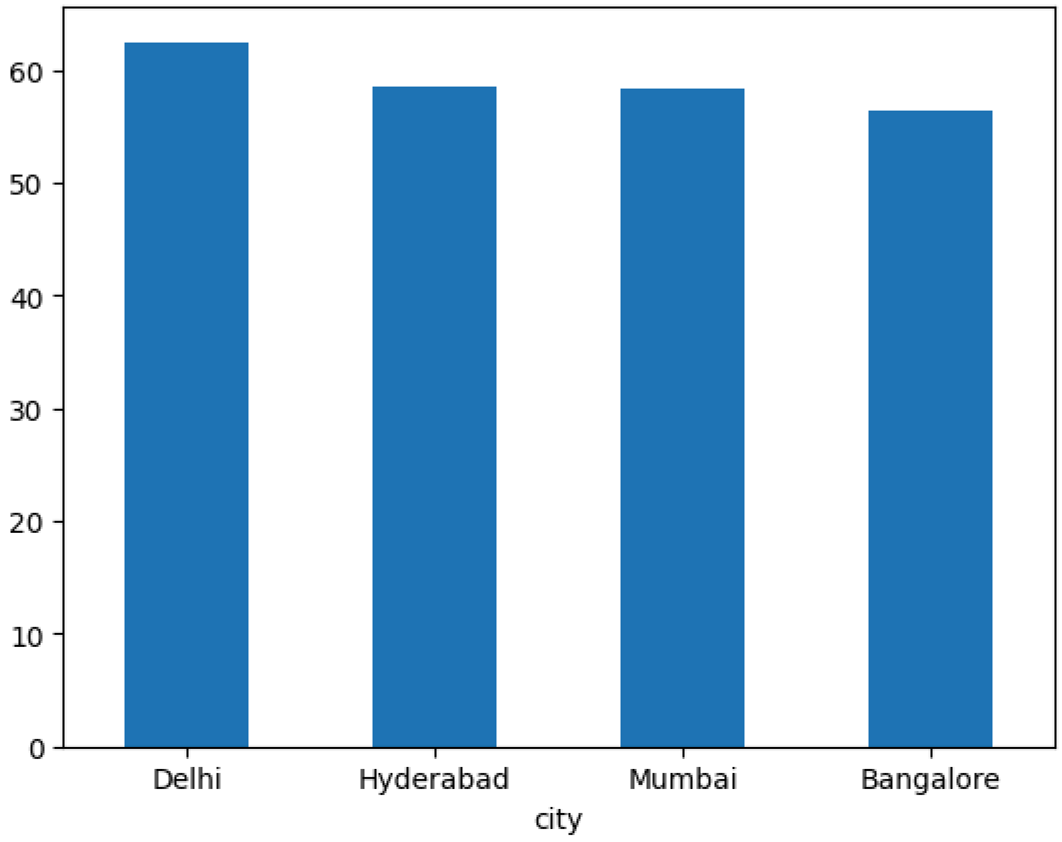
```
df_june_22.groupby('city')['occ_pct'].mean().round(2).sort_values(ascending=False)
```

Out[486…

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

In [487…

```
df_june_22.groupby('city')['occ_pct'].mean().round(2).sort_values(ascending=False).
plt.xticks(rotation=0)
plt.show()
```

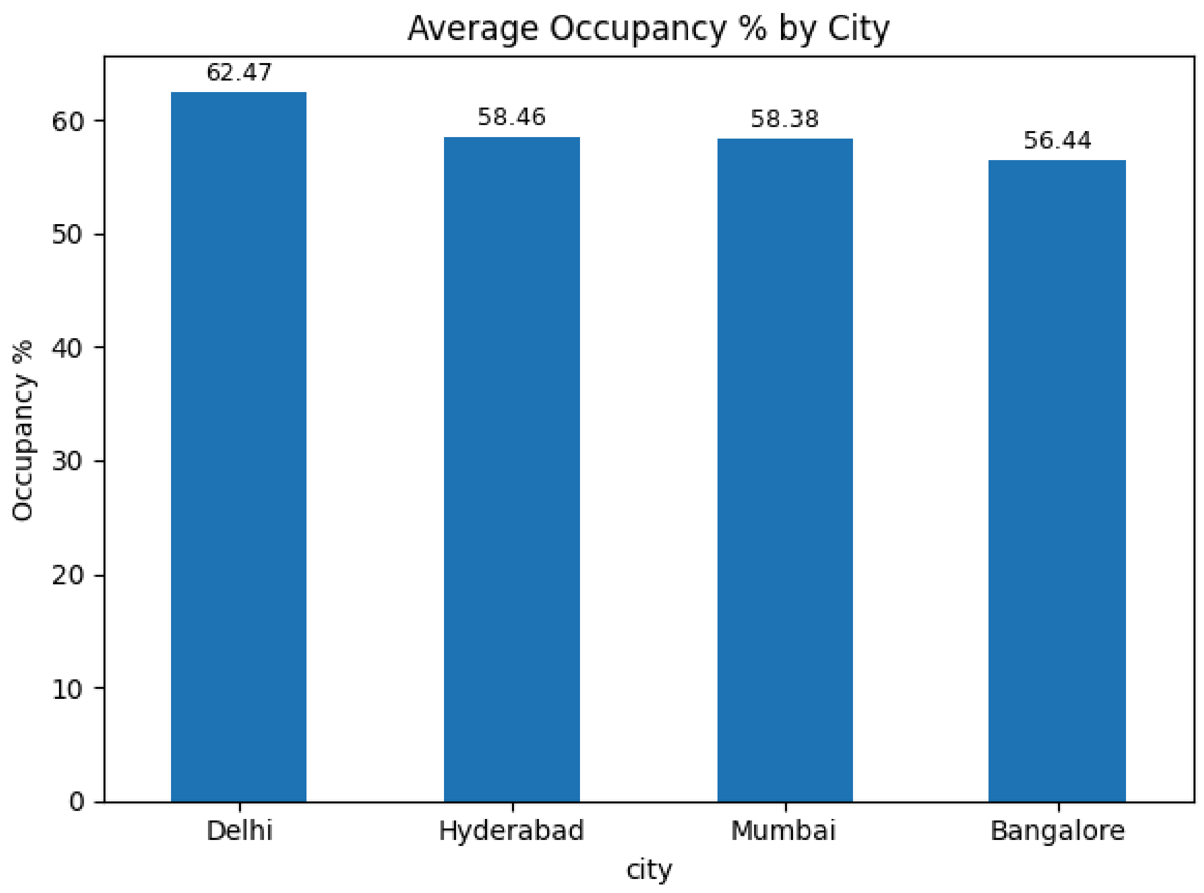


In [488…

```
# Plot and get the Axes object
ax = df_june_22.groupby('city')['occ_pct'].mean().round(2).sort_values(ascending=Fa

# Add data labels
for bar in ax.patches:
    height = bar.get_height()
    ax.text(bar.get_x() + bar.get_width() / 2, height + 0.5, f'{height:.2f}',
            ha='center', va='bottom', fontsize=9)

plt.xticks(rotation=0)
plt.ylabel("Occupancy %")
plt.title("Average Occupancy % by City")
plt.tight_layout()
plt.show()
```



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

In [489…
```
df_august = pd.read_csv("datasets/new_data_august.csv")
df_august.head(3)
```

Out[489…

	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 [490…
```
df_august.columns
```

Out[490…
```
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 [491…
```
df.columns
```

Out[491…
```
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 [492…
```python
df_august.shape
```

Out[492…
```
(7, 13)
```

In [493…
```python
df.shape
```

Out[493…
```
(6497, 14)
```

In [494…
```python
latest_df = pd.concat([df, df_august], ignore_index = True, axis = 0)
latest_df.tail(10)
```

Out[494…

	property_id	check_in_date	room_category	successful_bookings	capacity	occ_pct	r
6494	17558	31-Jul-22	RT4	3	6.0	50.0	F
6495	19563	31-Jul-22	RT4	3	6.0	50.0	F
6496	17561	31-Jul-22	RT4	3	4.0	75.0	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 [495…
```python
latest_df.shape
```

Out[495…
```
(6504, 15)
```

6. Print revenue realized per city

In [496…

```
df_bookings.head()
```

Out[496…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
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 [497…

```
df_hotels.head(3)
```

Out[497…

	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 [498…

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

Out[498…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
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

In [499…

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

Out[499…

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

7. Print month by month revenue

In [500…

```
df_date.head(3)
```

Out[500…

	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 [501…

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

Out[501…

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

In [502…

```
df_bookings_all.head(3)
```

Out[502…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
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

In [503…

```
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 [504…

```
df_date["date"] = pd.to_datetime(df_date["date"], format="%d-%b-%y")
df_date.head(3)
```

Out[504…

	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 [505…

```
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 [506…

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

Out[506…

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

In [507…

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

Out[507…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
0	May132216558RT11	16558	10/5/2022	2022-05-13	15-05-22	2.0
1	May132216558RT12	16558	9/5/2022	2022-05-13	14-05-22	2.0
2	May132216558RT13	16558	9/5/2022	2022-05-13	14-05-22	1.0

In [508…

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

Out[508…
```
mmm yy
Jul 22    329662416
Jun 22    324288215
May 22    347414213
Name: revenue_realized, dtype: int64
```

Exercise-1. Print revenue realized per hotel type

In [509…
```
# write your code here
df_bookings.head()
```

Out[509…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
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 [510…
```
df_hotels.head(4)
```

Out[510…

	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

In [511…
```
new_df=pd.merge(df_bookings,df_hotels,on="property_id")
new_df.head(4)
```

Out[511…

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
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

In [512…
```
new_df.groupby("property_name")['revenue_realized'].sum()
```

Out[512…
```
property_name
Atliq Bay        259996918
Atliq Blu        260851922
Atliq City       285798439
Atliq Exotica    320258588
Atliq Grands     211462134
Atliq Palace     304081863
Atliq Seasons     66086735
Name: revenue_realized, dtype: int64
```

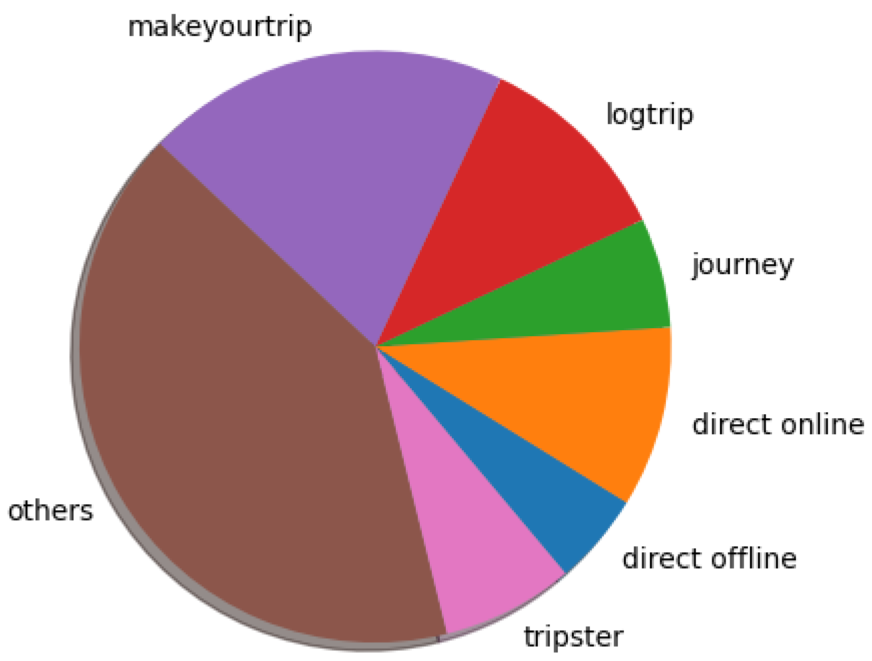
Exercise-2 Print average rating per city

In [513…
```
# write your code here
new_df.groupby("city")['ratings_given'].mean().round(2)
```

Out[513…
```
city
Bangalore    3.41
Delhi        3.78
Hyderabad    3.66
Mumbai       3.65
Name: ratings_given, dtype: float64
```

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

In [514…
```
# write your code here
new_df.groupby("booking_platform")['revenue_realized'].sum().plot(kind="pie",starta
plt.ylabel("")
plt.show()
```



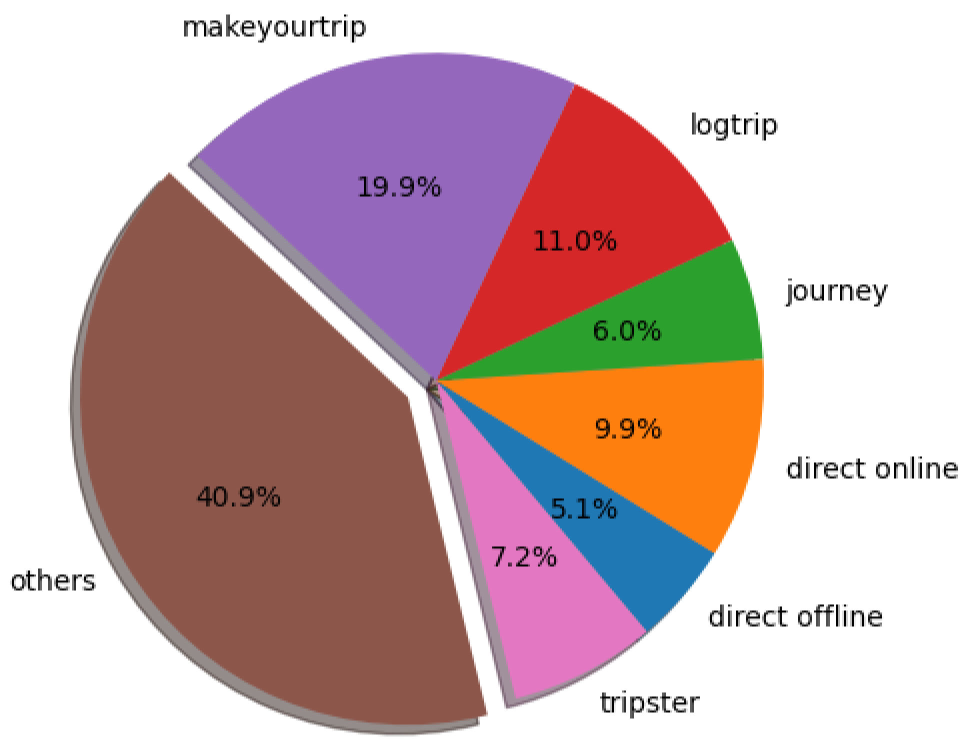
In [515…
```
# Prepare data
data = new_df.groupby("booking_platform")['revenue_realized'].sum()
```

```
labels = data.index
sizes = data.values

# Explode only the "others" slice
explode = [0.1 if label == "others" else 0 for label in labels]

# Plot
fig, ax = plt.subplots()
ax.pie(
    sizes,
    labels=labels,
    explode=explode,
    autopct='%1.1f%%',
    shadow=True,
    startangle=-50
)

ax.axis('equal')  # Keep it circular
plt.show()
```


makeyourtrip
logtrip
journey
direct online
direct offline
tripster
others