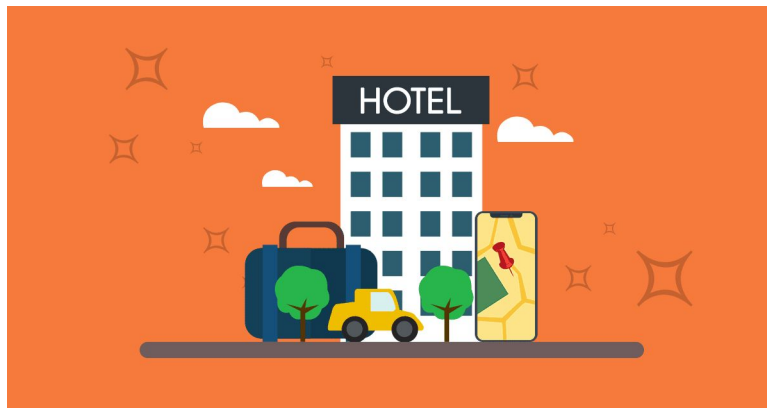# Capstone Project
Hotel Booking Data Analysis

TEAM MEMBER:

MD SAJID SAMI

YASHESH GUPTA

Point for Discussion

- **Data Summary**
- **Step involved in data analysis**
- **Hotel booking across the months**
- **Variation in number of hotel type booking across the months**
- **Customers most preferred type hotel**
- **Top 10 countries have maximum number of bookings**
- **Hotel type yearly bookings**
- **Cancellation in hotel bookings and percentage cancellation**
- **Percentage Cancellation and number of bookings in different market segment**
- **What is average daily rate(ADR)?**
- **Why ADR?**
- **Distribution of ADR values**
- **Average ADR of hotel types**
- **Average adr of members stays together at hotel**
- **Top 10 countries having best average ADR values**
- **Average ADR month and yearly**
- **Meal Analysis**
- **Car parking space analysis**
- **Conclusion**

Data Summary:

Based upon the initial assessment we found that the data was pretty much clean except for some missing values in a few columns. Upon using the info() method we draw out the following key insights about the data:-

- The dataset has a shape of (119390, 32) which means that it contains approximately 1.2 lakh rows and 32 columns.
- Our Dataset has 4 columns with float64 dtype, 16 columns with int64 dtype, and 12 columns with object dtype.

In our Dataset, we observed null values in the following columns:
- 4 null values in the children column
- 488 null values in the country column
- 16,340 null values in the agent column
- 112,593 null values in the company column

Steps involved in the Data Analysis:

1.Framing the questions: Before any form of analysis, it is important to frame the questions that we want to know from the data.

2.Filtering out the ideas: After getting a long list of questions and assumptions that we want to solve from the dataset.

3.Cleaning the Data: As mentioned before, the dataset provided to us by the Alma Better faculty was pretty much clean from the start. However, it had four variables with null values, so we had to take them into account before proceeding further with our analysis.

4.EDA analysis: By EDA we mean exploratory data analysis. In this, we looked at the dataframe and decided our target variables (Important Columns) based upon which we were going to conduct further analysis.

 5. Visualization of Insights: After we completed the analysis of our data, we used matplotlib and seaborn libraries of python to present our analysis graphically.

 6. Drawing Conclusions and Finding Answers: Finally we warped up each analysis by drawing out conclusions from them

Hotel booking across the months

Insight:

- The most preferred months are August and July which amount to the maximum number of bookings across the year.

- December and January seem to be the lowest contributors in terms of bookings.

- According to above insight we can see that April to August most peoples are going to vacation or travelling that's why between these booking is more.

- In months between November to march hotel booking are less.

confirmed booking per month

Variation in number of hotel type bookings across the months

Insight:

- August have the highest bookings for City and Resort hotels, and January has the least bookings of both the hotel.

- Most peoples are coming in city hotel from May to August and less booking November to march.

- In Resort hotel most booking between May to august whereas in month June have less booking

Monthly booking of different hotel
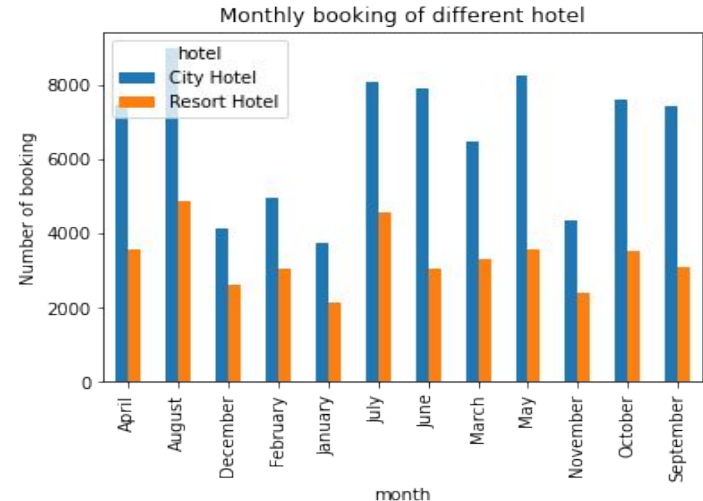
Customers most preferred type hotel
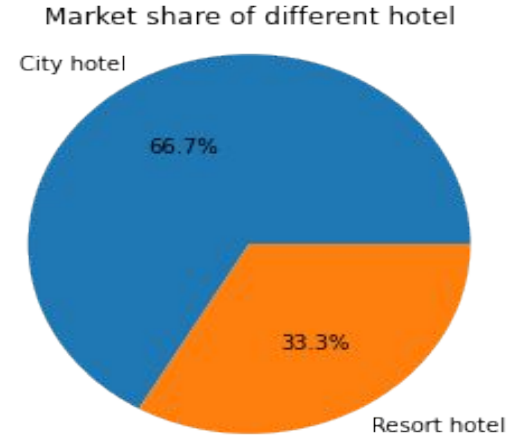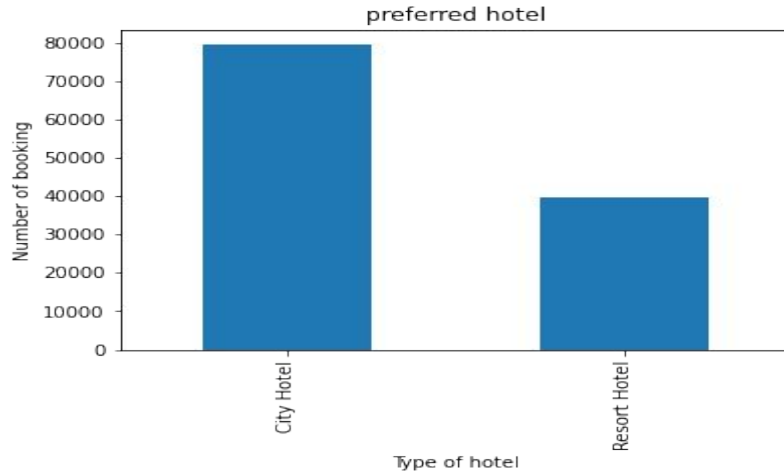
Insight:

Two third of peoples preferred city hotel because because most of people travel in city and they preferred city hotel not Resort hotel.

# Top 10 countries having maximum number of bookings

Insight:
- Top 5 country who are having the maximum Number of booking
    1. PRT: Portugal
    2. GBR: United Kingdom
    3. FRA: France
    4. ESP: Spain
    5. DEU: Germany
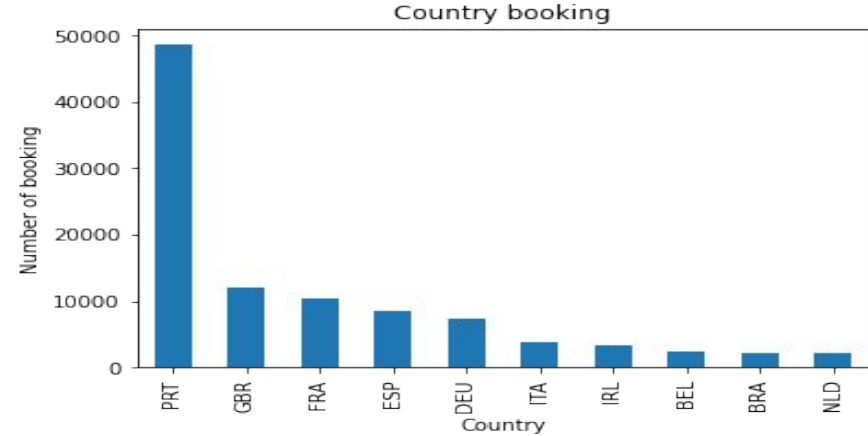
- From this data Prt (Portugal) have maximum number of bookings.So Portugal , Spain , France , Germany and United Kingdom are the top 5 countries.

- Main reason for most people are visiting Portugal because of its beauty and maximum people are visiting here in summer.
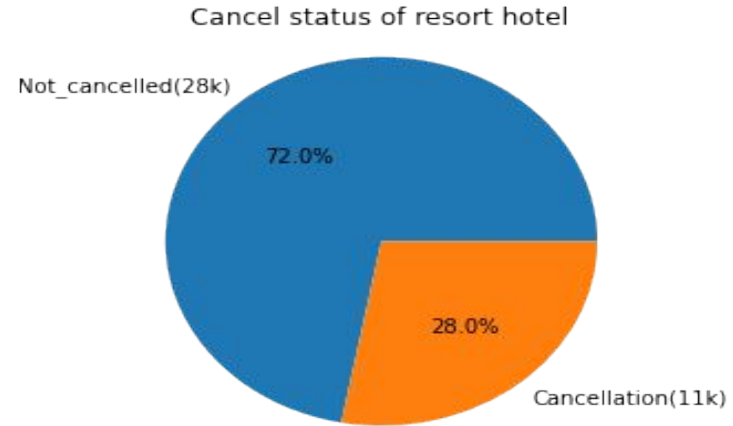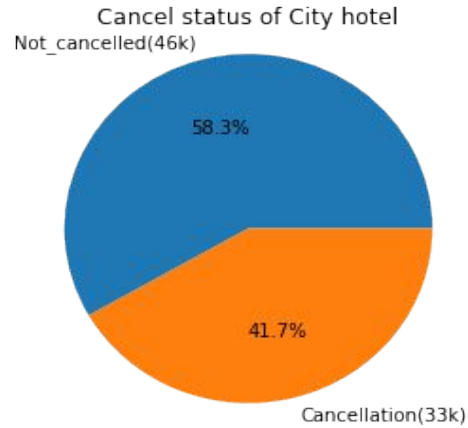
Hotel type yearly bookings
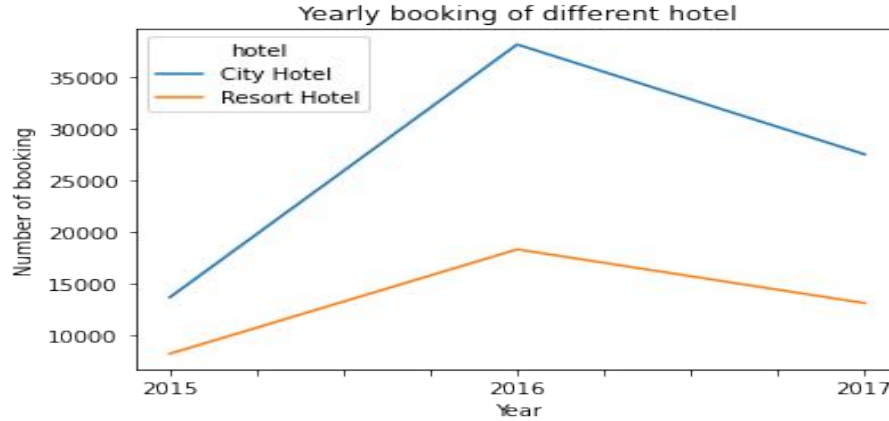
Insight:
- Number of bookings is higher in City Hotel as compare to Resort Hotel.
- Sales (No. of bookings) have declined for both the hotels after 2016 and the decline appears to be sharper in the case of City Hotel.
- Highest number of booking have seen for both hotels is 2016.

Cancellation in hotel type bookings and the percentage cancellations in hotels.
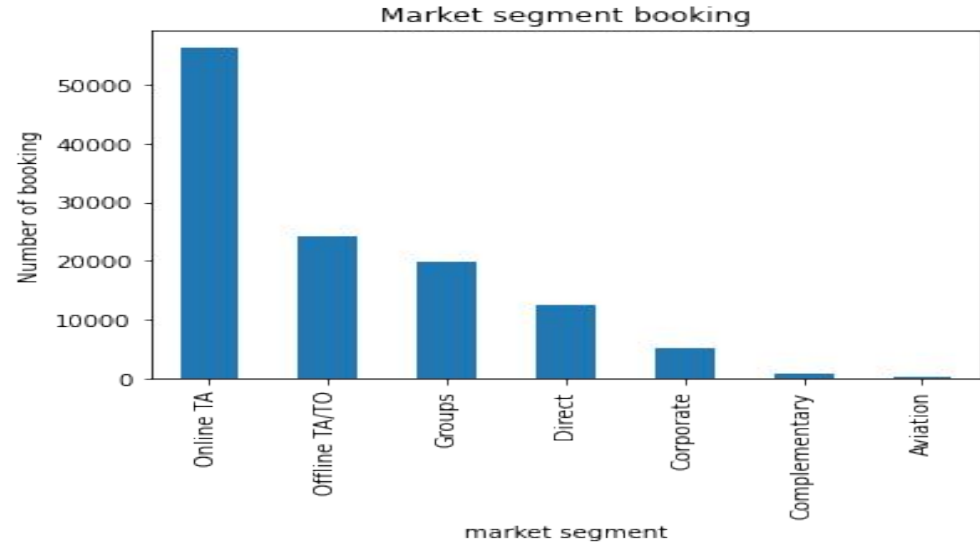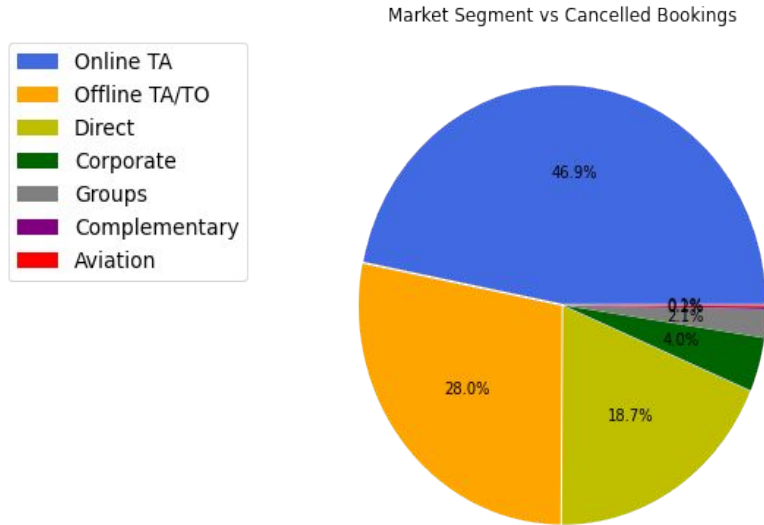

Insight:

- ○ City hotels are more cancelling the bookings as compare to the resort hotels.
- ○ Around 46k booking has been canceled in city hotels.

Cancel status of City hotel

Not_cancelled(46k)

58.3%

41.7%

Cancellation(33k)

Cancel status of resort hotel

Not_cancelled(28k)

72.0%

28.0%

Cancellation(11k)

Insight :

- ○ Cancel status of city hotel is 41.7% and 28% for resort hotel.
- ○ Cancellation is more in city hotels as compare to resort hotel.

Percentage cancellation and number of booking in different market segment.

Market Segment vs Cancelled Bookings

- Online TA
- Offline TA/TO
- Direct
- Corporate
- Groups
- Complementary
- Aviation

46.9%
28.0%
18.7%
4.0%
2.1%
0.2%

Market segment booking

Number of booking

market segment

Insight:

- Almost 47% bookings have canceled which came through the Online TA which is almost doubled of offline TA/TC.

- Negligible cancellation in complementary and aviation.

- Almost above 90% of booking cancelled by onlineTA, OfflineTA/TC and Direct.

- We obtain from above analysis booking from group is less canceled, it is third largest booking market segment but in cancel percentage is less as compare to other market segment.

- We can conclude that online TA brings maximum bookings and also maximum cancel hotel bookings. We can give good offer and good quality so we can reduced online cancel percentage.

What is Average Daily Rate (ADR)?

The average daily rate (ADR) shows how much revenue is made per room on average. The higher the ADR, the better. A rising ADR suggests that a hotel is increasing the money it's making from renting out rooms. To increase the ADR, hotels should look into ways to boost price per room.



$$ADR = \frac{Room\ Revenue}{\#\ Rooms\ Sold}$$

Why ADR?

- The average daily rate (ADR) measures the average rental revenue earned for an occupied room per day.
- The operating performance of a hotel or other lodging business can be determined by using the ADR.
- Multiplying the ADR by the occupancy rate equals the revenue per available room.
- Hotels or motels can increase the ADR through price management and promotions.

Distribution of ADR values :

Insights:

- The maximum Hotels having ADR is in between 60-120.

- The average ADR is in between 90-120 which is approximate 100.

- There are very few hotels who has value of ADR above 150.

Average Daily Rate Count
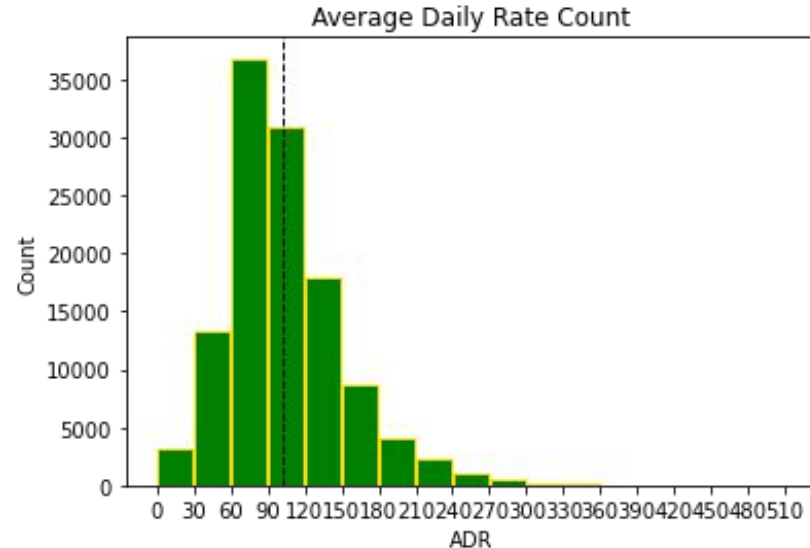
Hotel Types Average adr

Insight:

- The average "ADR" of a city hotel is more than a resort hotel.

- Though there not much difference in between them.

- People prefer city hotel more than resort hotel.

Average ADR Of Hotel Types
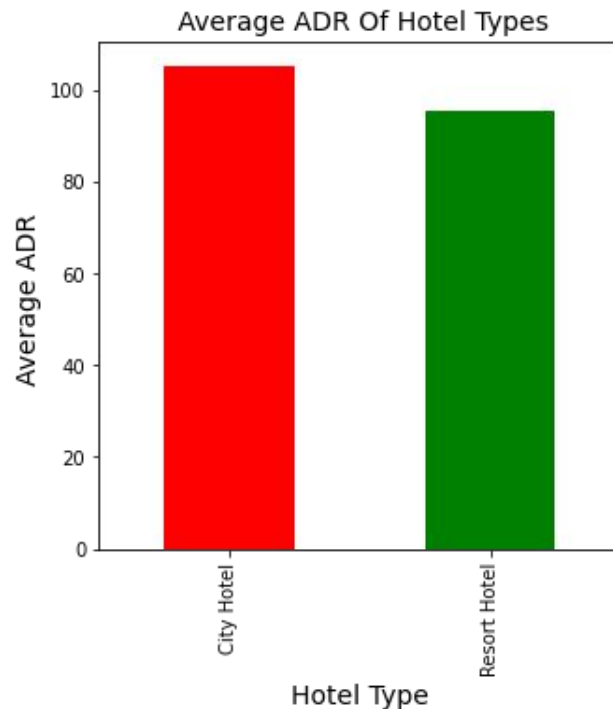
# AVG ADR OF Number Of Members Stays Together At A Hotel

Insight:

- Average ADR value of the city hotels is increasing zero to five members.
- Average ADR value is highest of the city hotels when 5 member stays at time in the hotel.
- After 5 members the average adr is decreasing for the city hotels because very less people travel with more than 5 people.
- Average ADR value of the resort hotel is increasing zero to four members.
- Average ADR value is highest of the resort hotel when 4 members stay at a time in the hotel.
- After 4 members ,the average adr is decreasing for the resort hotel because very few people travel with more than 5 people.

- Hotels can make strategies so that the number of people staying per day will increase and it will affect adr in a good way.

AVG ADR OF Number Of Members Stays Together At A Hotel
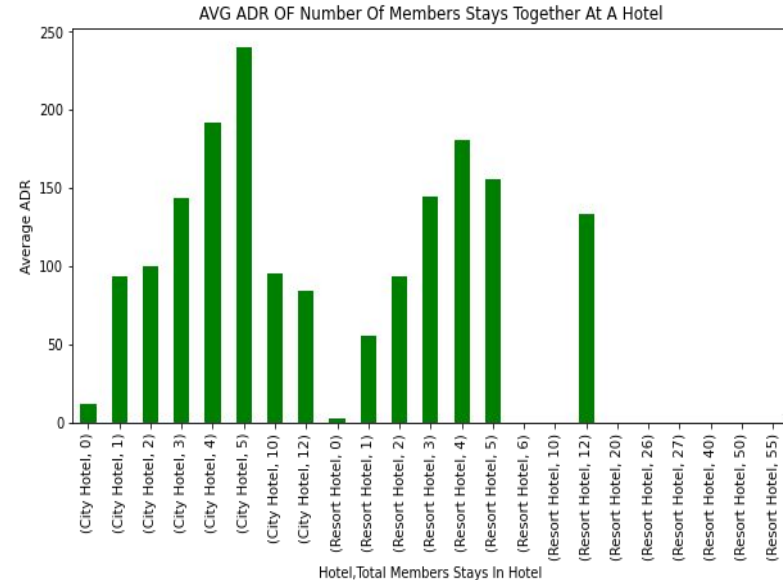
# Top 10 Countries Having Best Average ADR

Insight:

- Top 5 countries who are having the average ADR values are
    1. AIA:Anguila
    2. AND:Andorra
    3. UMI:United States Minor Outlying Islands
    4. LAO:Laos
    5. MYT: Mayotte

- Hotels can analyze these top 5 countries , what brings tourism here and they can apply these factors to their business.
- Why do tourists prefer Anguila?
    1. Beaches and associated recreational activities
    2. Climat
    3. Peaceful and relaxed island
   4. Friendly local People
    5. Service and facilities

Top 10 Countries Having Best Average ADR
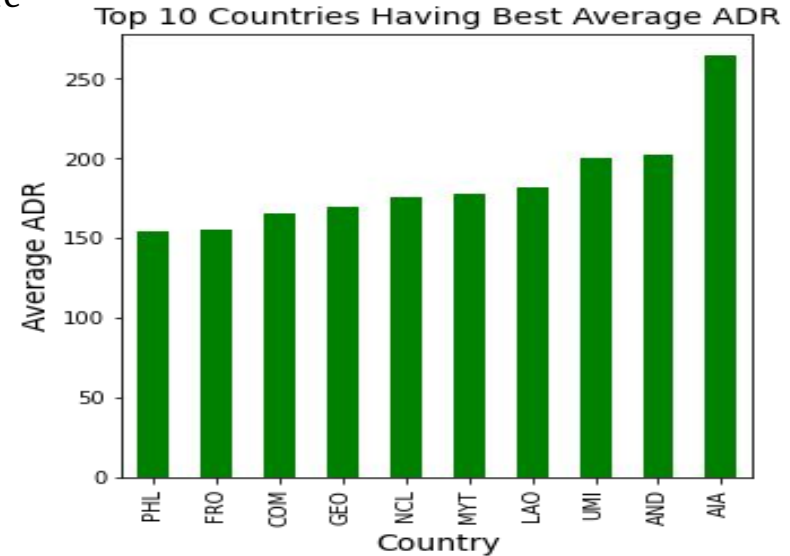
AVG ADR Of Month And Year

Insight:

- August is the best month for the hotel business in all years(2015-2017) because average adr is the highest of August for all years.
- Average ADR is good in June ,July ,August for all years as compared to other months.
- Hotels are getting the best business during June-August.
- People prefer summers for outings.
- Hotels can make strategies to get more business during June-August.
- Average ADR is increasing every year that shows hotel business is growing every year with a decent number.
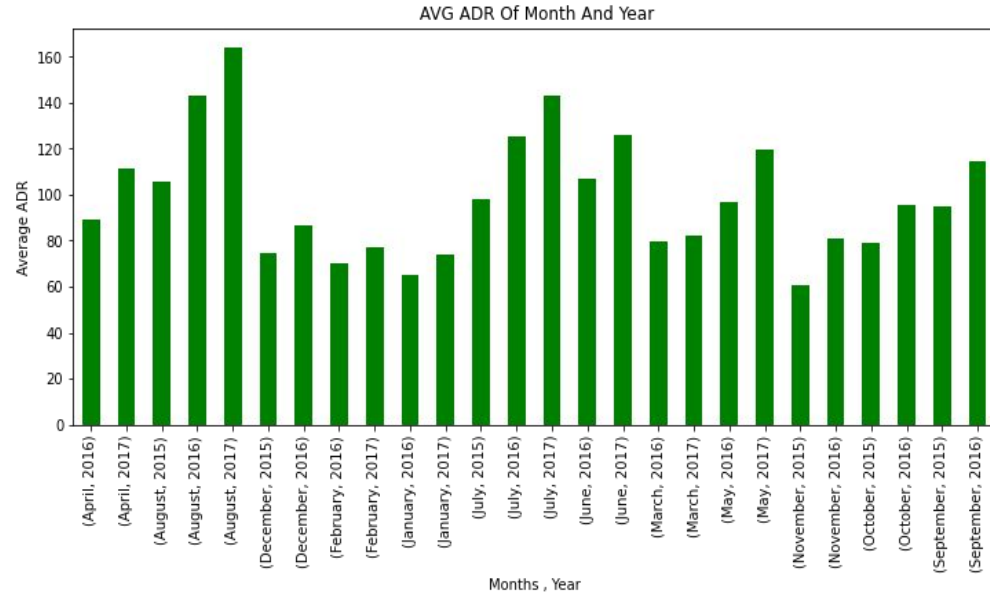
Meal Analysis

Meal Vs Meal Count
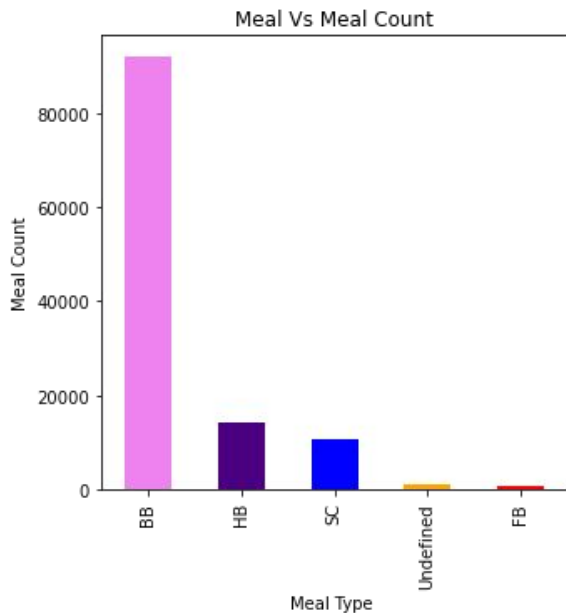
Meal Type Consume By Customers
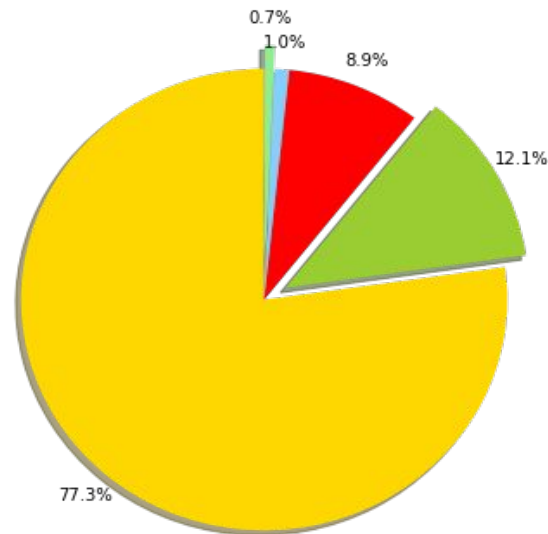
Insight

- Almost 77.3% of people prefered **Bed and Breakfast** at the hotel where they stay.

- Most people prefer to eat lunch and dinner outside the hotel.
- People love to explore city local food at different different places.

Car parking space analysis

Insight:

- Maximum hotels have 0-1 car parking space.

- The hotels are having international tourism so people prefer travel with taxis and their local transport service.
- Hotel parking space does not affect the business.
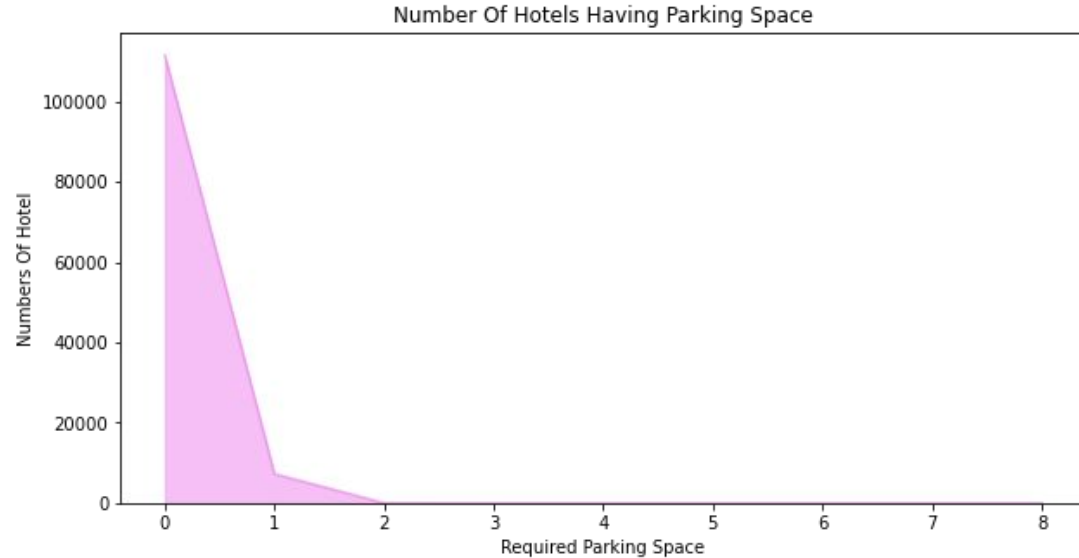
Conclusion:

- Maximum number of booking has been observed in Month of August and lowest in January.
- Customer most preferred hotel is "city hotel.
- Portugal is the country which has maximum number of hotel bookings.
- Highest number of booking have seen for both hotels is 2016.
- Cancellation is more in city hotels as compare to resort hotel.
- Online TA brings maximum bookings and also maximum cancellations .
- The average ADR for hotels is in between 90-120 which is approximate 100.
- The average "ADR" of a city hotel is more than a resort hotel.
- Average ADR value is highest of the city hotels when 5 member stays at time in the hotel and 4 is for resort hotel.
- Anguila has best average adr value among all country.
- August is the best month for the hotel business in all years(2015-2017) because average adr is the highest of August for all years.
- Average ADR is increasing every year that shows hotel business is growing every year with a decent increment.
- Almost 77.3% of people prefered **Bed and Breakfast** at the hotel where they stay
- Maximum hotels have 0-1 car parking space.
- Hotel parking space does not affect the business.