

# REPORT

## Hotel Data Analysis Project

### Business Problem :

In recent years, City Hotel and Resort Hotel have seen high cancellation rates. Each hotel is now dealing with a number of issues as decrease in revenues and less than ideal hotel room use. Consequently, lowering cancellation rates is both hotels' primary goal in order to increase their efficiency in generating revenue, and for us to offer thorough business advice to address this problem. The analysis of hotel booking cancellations as well as other factors that have no bearing on their business and yearly revenue generation are the main topics of this report.



### Assumptions :

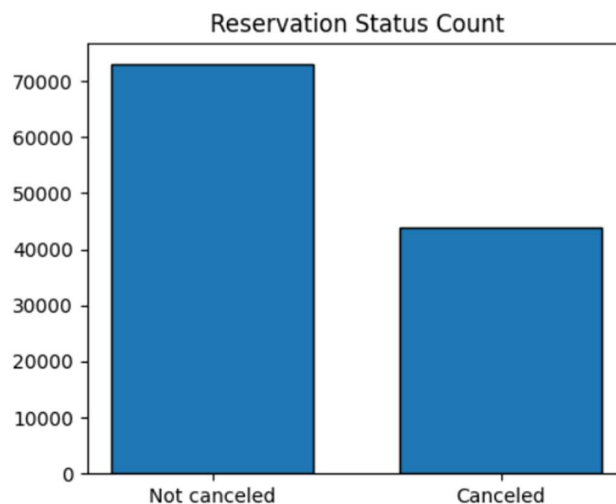
- No unusual occurrences between 2015 and 2017 will have a substantial impact on the data used.
- The information is considered as a current situation and can be used to analyze a hotel's possible plans in an efficient manner.
- There are no unanticipated negatives to the hotel employing any advised technique.
- The hotels are not currently using any of the suggested solutions.
- The biggest factor affecting the effectiveness of earning income is booking cancellations.
- Cancellations result in vacant rooms and no revenue for that particular date when the cancellation is done by the customer.
- Clients make hotel reservations the same month they make cancellations.

## Research Questions :

- What are the variables that affect hotel reservation cancellations?
- How can we make hotel reservations cancellations better?
- How will hotels be assisted in making pricing and promotional decisions?

## Analysis and Findings :

1. The accompanying bar graph shows the percentage of reservations that are canceled and those that are not.  
It can be observed that there are still a significant number of reservations that have not been canceled. But also, there are still **37% of customers who canceled their reservation**, which has a significant impact on the hotels' earnings.



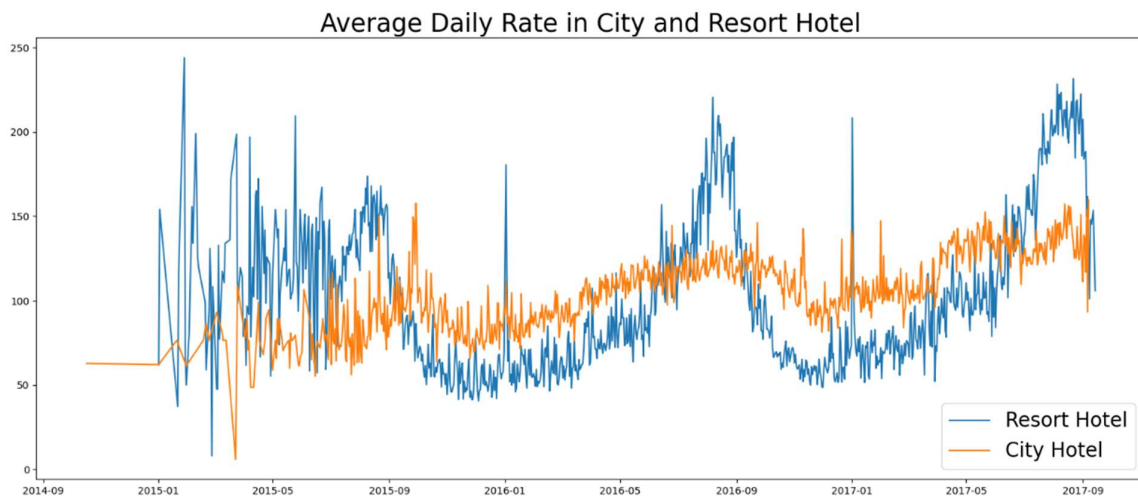
2. In the accompanied bar-graph it can be seen that in comparison to Resort Hotels, City Hotels have more bookings. It's possible that resort hotels are more expensive than those in cities.  
By running the code written below, we will observe that **72% of the bookings are successful while 28% are being cancelled**, which is also been reflected on the graph

```
resort_hotel = df[df['hotel'] == 'Resort Hotel']  
resort_hotel['is_canceled'].value_counts(normalize = True)
```



3. The line graph below shows that, on certain days, the Average Daily Rate (adr) for a **City Hotel is less than that of a Resort Hotel**, and on other days, it is even less.

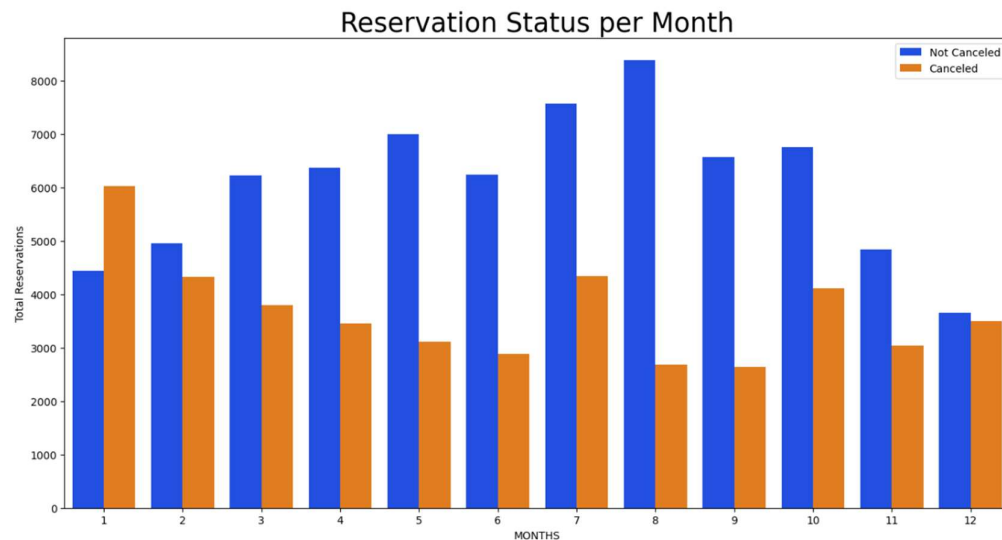
The spikes in the graph can be considered as 'weekends' bookings. And, it goes without saying that weekends and holidays may see a rise in Resort Hotel rates.



4. The grouped bar graph shown below is generated to analyze the months with the highest and lowest reservation levels according to reservation status. It can be observed that both the number of confirmed reservations and the number of canceled reservations are largest in the month of August, whereas January is the month with the most canceled reservations.

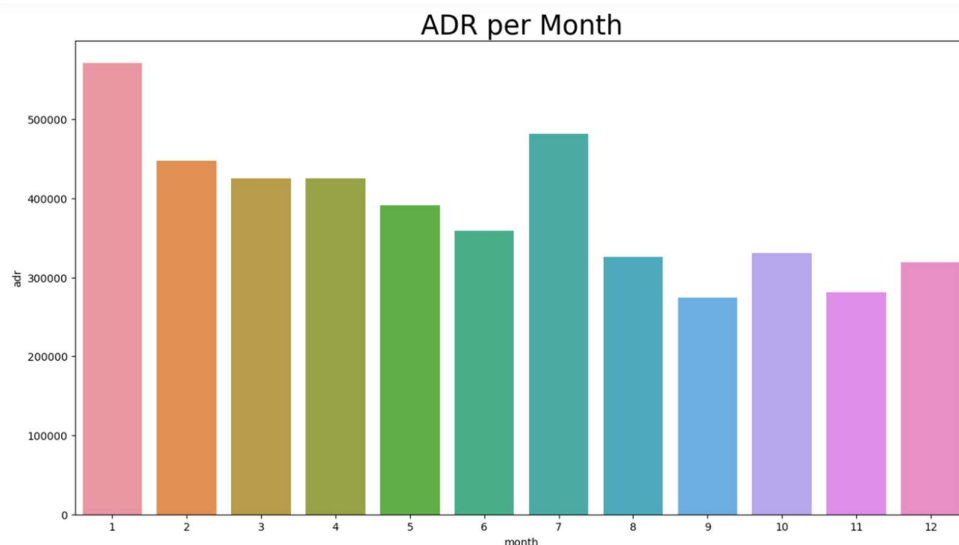
Here onwards, the month number will be denoting the respective month :

1 – Jan ; 2 – Feb ; 3 – Mar ..... 12 – Dec



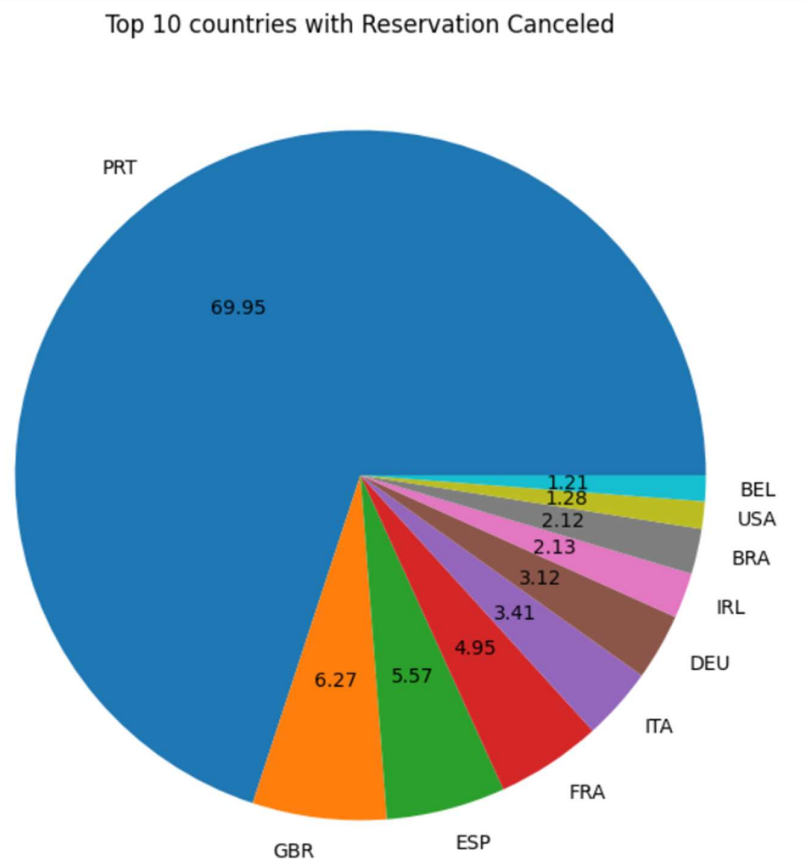
5. The following bar-graph demonstrates that cancellations are most common when prices are highest and are least common when they are lowest. Therefore, the cost of the accommodation is solely responsible for the cancellation.

The height of each bar represents the ADR (Average Daily Rate) sum value for that month.



6. The pie-chart below identifies the Top-10 countries which has the highest reservation canceled.

The top country is Portugal with the highest number of cancellations followed by Great Britain (GBR) and Spain (ESP).



7. We can also check the area from where guests are visiting the hotels and making reservations.

Is it coming from Direct or Groups, Online or Offline Travel Agents?

By executing the following codes below, it can be observed that around 46% of the customers come from online travel agencies, whereas 27% come from groups. Only 4% of customers book hotels directly by visiting them and making reservations.

By looking at the metrics, it can be observed that the booking and cancellation are almost same for Online TravelAgents segment.

This can be possible due to false information of the hotels on the websites OR due to the surrounding of the hotel, etc.

```
1 df['market_segment'].value_counts()
```

```
market_segment
Online TA      56036
Offline TA/TO  23829
Groups         19554
Direct         12210
Corporate       5035
Aviation        231
Complementary    63
Name: count, dtype: int64
```

Online TravelAgents brings the highest bookings.

```
1 df['market_segment'].value_counts(normalize = True)
```

```
market_segment
Online TA      0.479112
Offline TA/TO  0.203740
Groups         0.167188
Direct         0.104396
Corporate       0.043050
Aviation        0.001975
Complementary  0.000539
Name: proportion, dtype: float64
```

```
1 cancelled_data['market_segment'].value_counts(normalize = True)
```

```
market_segment
Online TA      0.471410
Groups         0.274705
Offline TA/TO  0.187467
Direct         0.042982
Corporate       0.022162
Aviation        0.001160
Complementary  0.000114
Name: proportion, dtype: float64
```

Online TravelAgents also invites highest cancellations.

## SUGGESTIONS :

- The analysis indicates a direct correlation between cancellation rates and pricing levels, suggesting that higher pricing often leads to increased cancellations.  
To mitigate this issue effectively, hotels should focus on refining their pricing strategies. A recommended approach involves implementing location-based pricing adjustments, tailoring rates to specific hotels based on their geographical appeal and market demand.  
Moreover, offering attractive discounts and promotions to consumers can serve as an incentive for guests to commit to their reservations, further reducing cancellation tendencies.
- The analysis also reveals that the Resort Hotel experiences a higher ratio of cancellations compared to the City Hotels.  
To effectively address this discrepancy, it is recommended that the Resort Hotel adopts a strategic approach by offering reasonable discounts on room prices during weekends or holidays.  
By incentivizing potential guests with attractive pricing incentives during peak periods, the Resort Hotel can encourage higher booking commitments and reduce the proportion of cancellations. This approach aims to strike a balance between revenue generation and guest satisfaction, ultimately boosting the resort hotel's overall performance and mitigating the impact of cancellations on its business.
- To capitalize on potential revenue opportunities and counteract the higher cancellation rates observed during the month of January, hotels are advised to launch strategic marketing campaigns.  
By allocating a reasonable budget towards these promotional efforts, hotels can target both new and existing customers, enticing them with appealing offers and incentives. Such marketing initiatives may include exclusive discounts, package deals, or value-added services, specifically designed to attract guests during this period.
- To effectively mitigate the cancellation rate, hotels, particularly those in Portugal, can focus on enhancing the overall quality of their establishments and services.  
By investing in improvements and upgrades, hotels can elevate the guest experience, fostering greater satisfaction and loyalty among patrons. An emphasis on exceptional hospitality, combined with attention to detail, will contribute to creating memorable stays for guests, thereby reducing the likelihood of cancellations..  
By prioritizing quality and service excellence, hotels in Portugal can solidify their position as preferred accommodation choices, ultimately driving a decline in cancellations and nurturing sustained revenue growth.