

Capstone Project -1

AI

HOTEL BOOKING ANALYSIS

Project Type : Exploratory Data Analysis

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2) Kishore Kumar.
3) Monu Kumar.

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PROJECT SUMMARY

Have you ever wondered when the best time of year to book a hotel room is? Or the optimal length of stay in order to get the best daily rate? Cancellation? This hotel booking dataset can help you explore those questions! This data set contains booking information for a city hotel and a resort hotel, and includes information such as when the booking was made, length of stay, the number of adults, children, and/or babies, and the number of available parking spaces, among other things. All personally identifying information has been removed from the data. Explore and analyze the data to discover important factors.

Define Business Objective?

- 1) Control the Cancellation?
- 2) Prior alert best time to do book the hotel?
- 3) Suggest attractive offer to given particular market segment to boost booking?
- 4) Suitable way to constant the average daily rate?

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KNOW DATA

- 1) The Dataset consist of 119390 observation & 32 features.
- 2) 31994 observation found duplicates.
- 3) Features categorised.



Continuous Feature :

['lead_time', 'arrival_date_week_number', 'arrival_date_day_of_month', 'stays_in_weekend_nights', 'stays_in_week_nights', 'previous_bookings_not_canceled', 'days_in_waiting_list', 'adr']

Discrete Feature :

['hotel', 'is_canceled', 'arrival_date_year', 'arrival_date_month', 'adults', 'children', 'babies', 'meal', 'country', 'market_segment', 'distribution_channel', 'is_repeated_guest', 'previous_cancellations', 'reserved_room_type', 'assigned_room_type', 'booking_changes', 'deposit_type', 'agent', 'company', 'customer_type', 'required_car_parking_spaces', 'total_of_special_requests', 'reservation_status', 'reservation_status_date']

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FEATURE DESCRIPTION

hotel : Hotel(Resort Hotel or City Hotel)

is_canceled : Value indicating if the booking was canceled (1) or not (0)

lead_time : Number of days that elapsed between the entering date of the booking into the PMS and the arrival date

arrival_date_year : Year of arrival date

arrival_date_month : Month of arrival date

arrival_date_week_number : Week number of year for arrival date

arrival_date_day_of_month : Day of arrival date

stays_in_weekend_nights : Number of weekend nights (Saturday or Sunday) the guest stayed or booked to stay at the hotel

stays_in_week_nights : Number of week nights (Monday to Friday) the guest stayed or booked to stay at the hotel

adults : Number of adults

children : Number of children

babies : Number of babies

meal : Type of meal booked. Categories are presented in standard hospitality meal packages:

country : Country of origin.

market_segment : Market segment designation. In categories, the term “TA” means “Travel Agents” and “TO” means “Tour Operators”

distribution_channel : Booking distribution channel. The term “TA” means “Travel Agents” and “TO” means “Tour Operators”

is_repeated_guest : Value indicating if the booking name was from a repeated guest (1) or not (0)

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FEATURE DESCRIPTION

is_repeated_guest : Value indicating if the booking name was from a repeated guest (1) or not (0)

previous_cancellations : Number of previous bookings that were cancelled by the customer prior to the current booking

previous_bookings_not_canceled : Number of previous bookings not cancelled by the customer prior to the current booking

reserved_room_type : Code of room type reserved. Code is presented instead of designation for anonymity reasons.

assigned_room_type : Code for the type of room assigned to the booking.

booking_changes : Number of changes/amendments made to the booking from the moment the booking was entered on the PMS until the moment of check-in or cancellation

deposit_type : Indication on if the customer made a deposit to guarantee the booking.

agent : ID of the travel agency that made the booking

company : ID of the company/entity that made the booking or responsible for paying the booking.

days_in_waiting_list : Number of days the booking was in the waiting list before it was confirmed to the customer

customer_type : Type of booking, assuming one of four categories

adr : Average Daily Rate as defined by dividing the sum of all lodging transactions by the total number of staying nights

required_car_parking_spaces : Number of car parking spaces required by the customer

total_of_special_requests : Number of special requests made by the customer (e.g. twin bed or high floor)

reservation_status: Reservation last status, assuming one of three categories

reservation_status_date : Date at which the last status was set. This variable can be used in conjunction with the ReservationStatus to understand when was the booking canceled or when did the customer checked-out of the hotel

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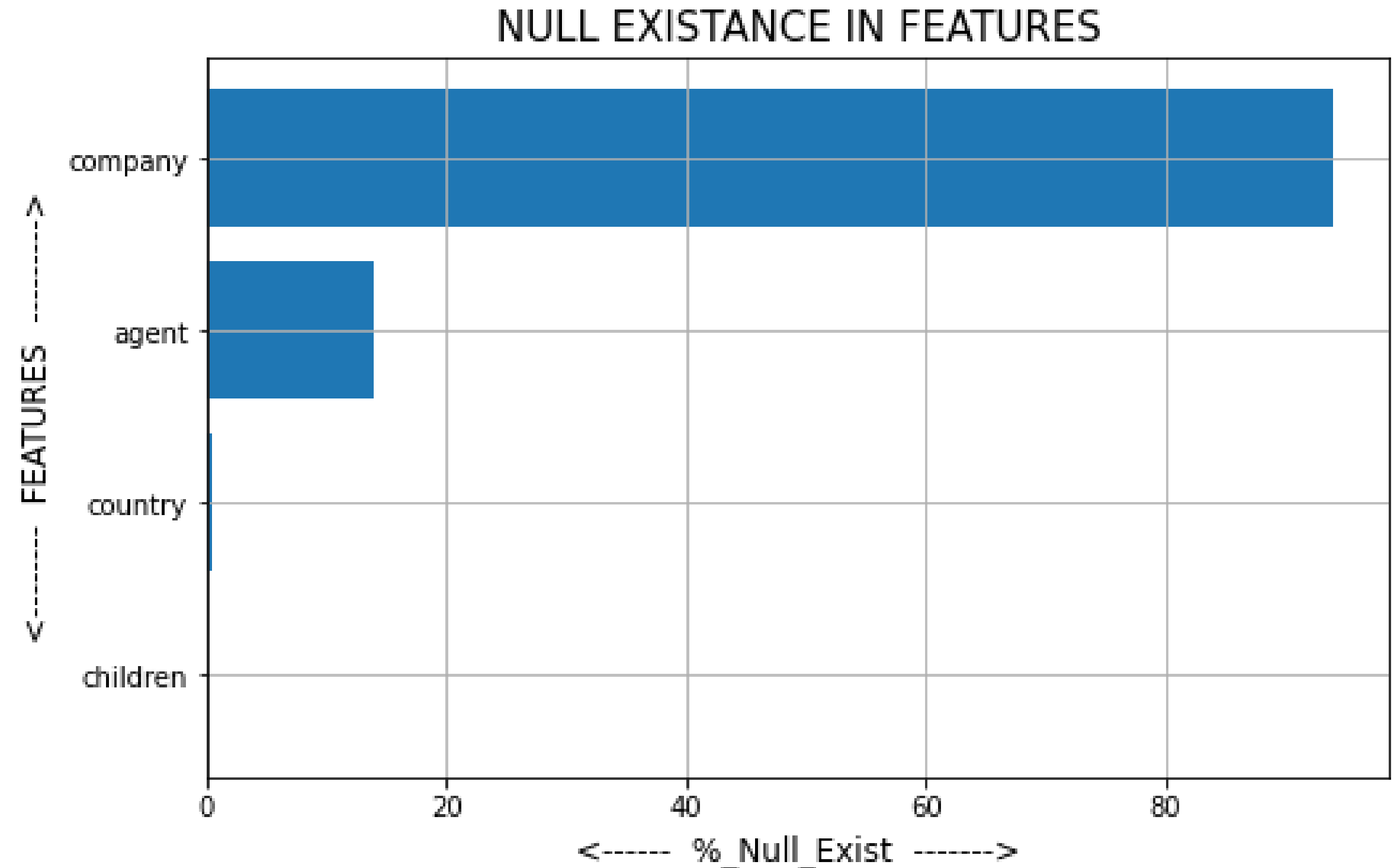
NULL EXISTENCE FEATURES

1) Company.

2) Agent.

3) Country.

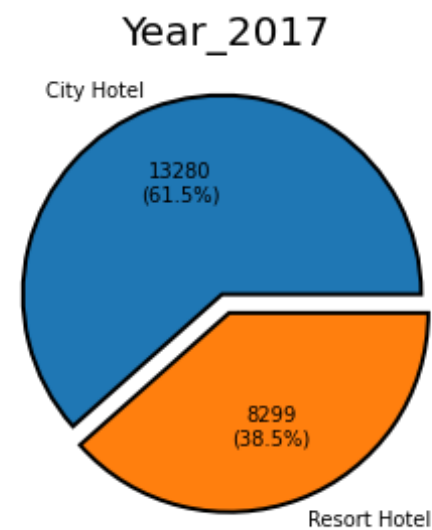
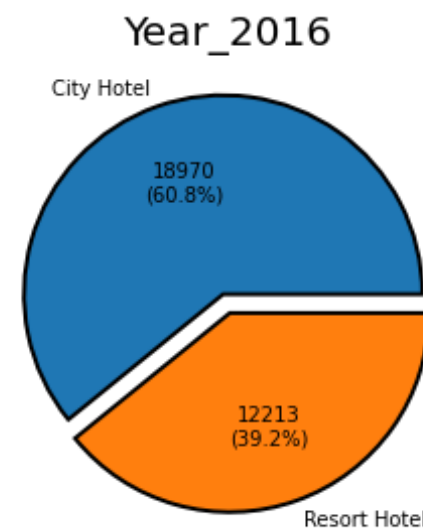
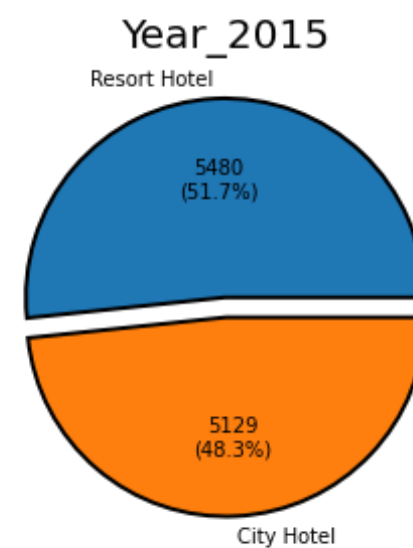
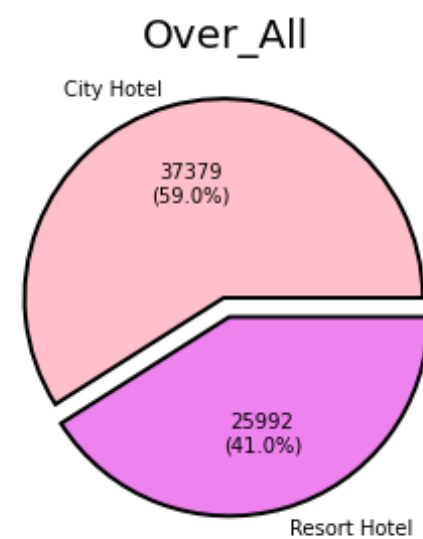
4) Children.



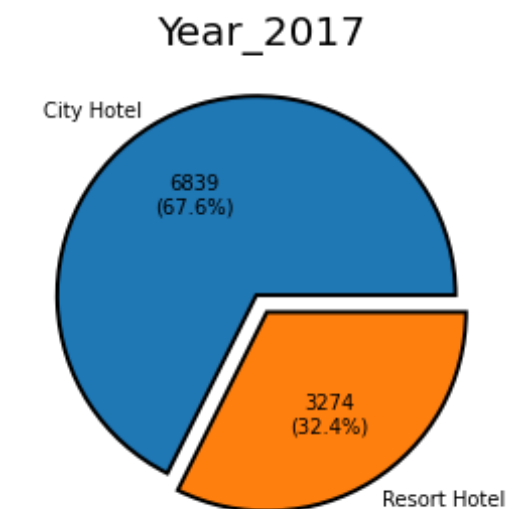
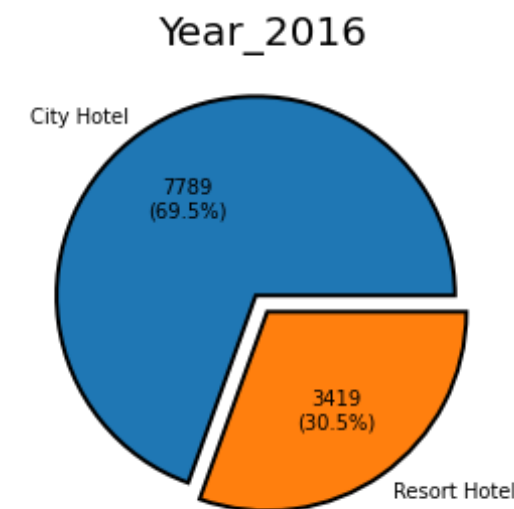
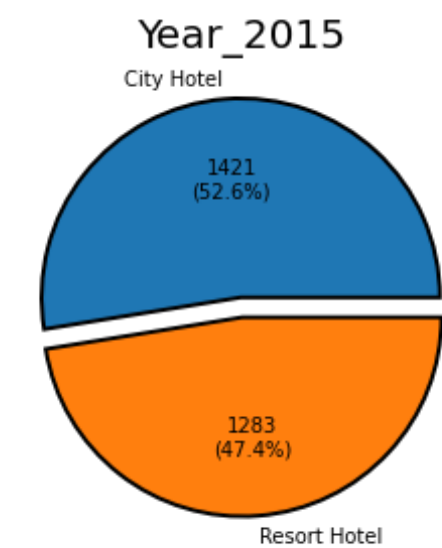
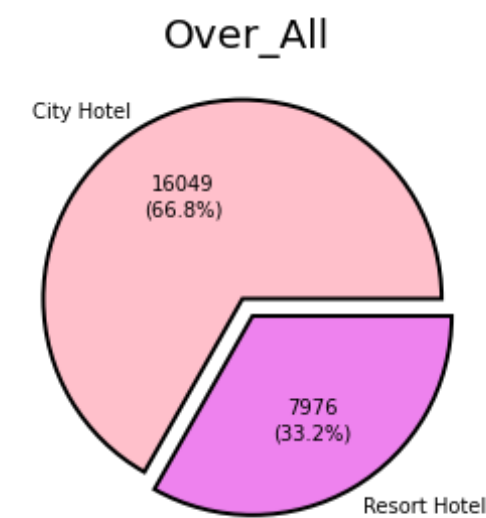
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CANCELLATION ANALYSIS

Confirm Booking Allocation



Actual Booking Cancellation



Cancellation percentage is 30.03%

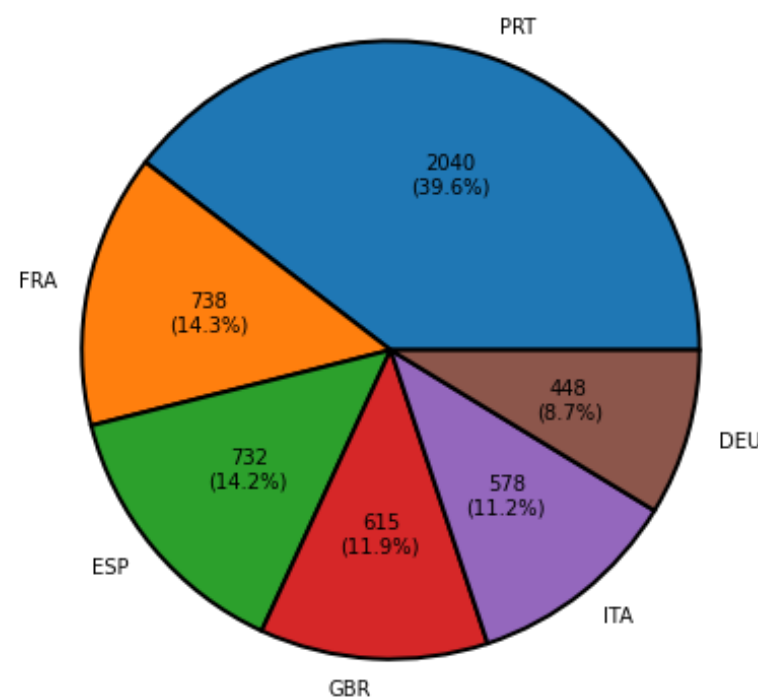
Cancellation percentage of city hotel is very high that can drag our business growth.

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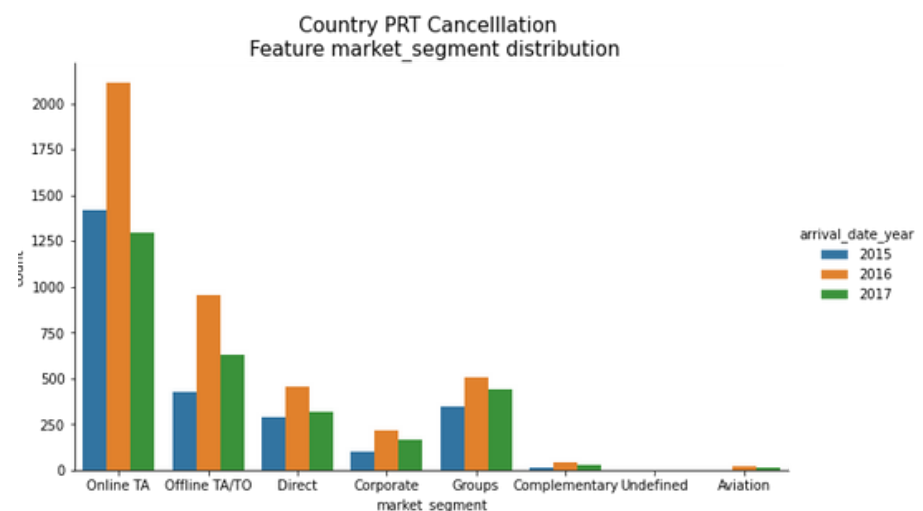
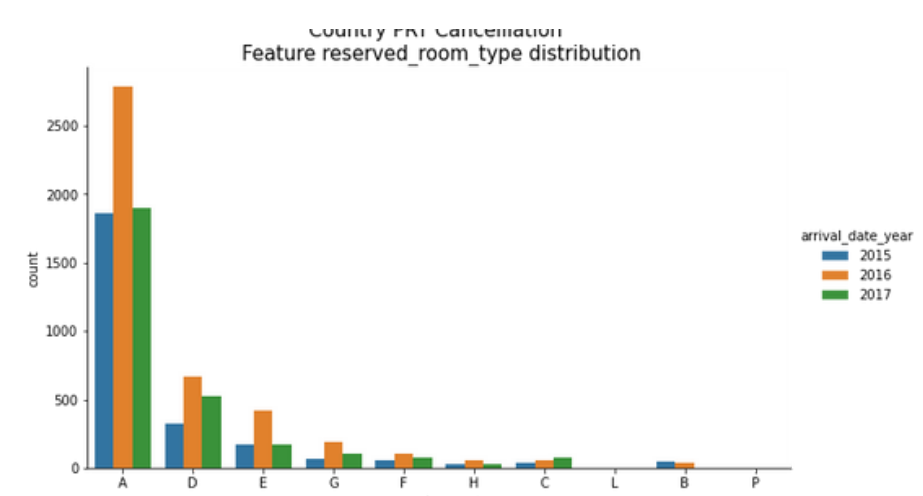
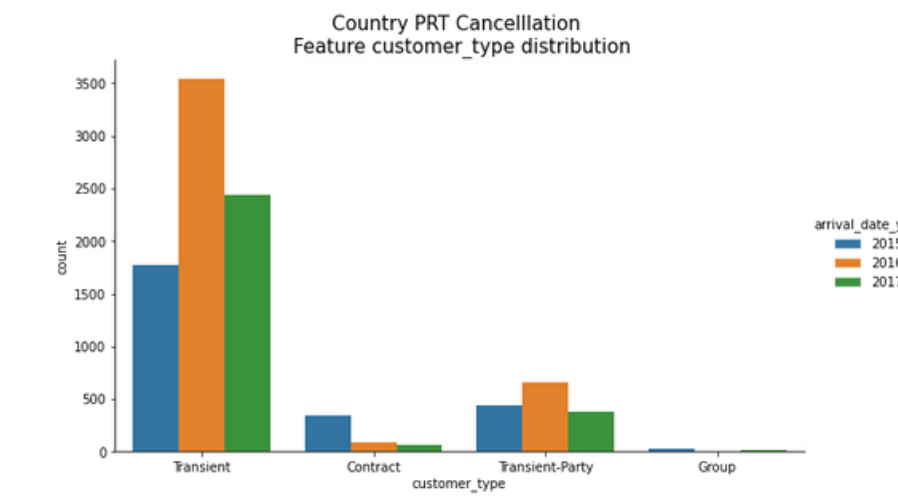
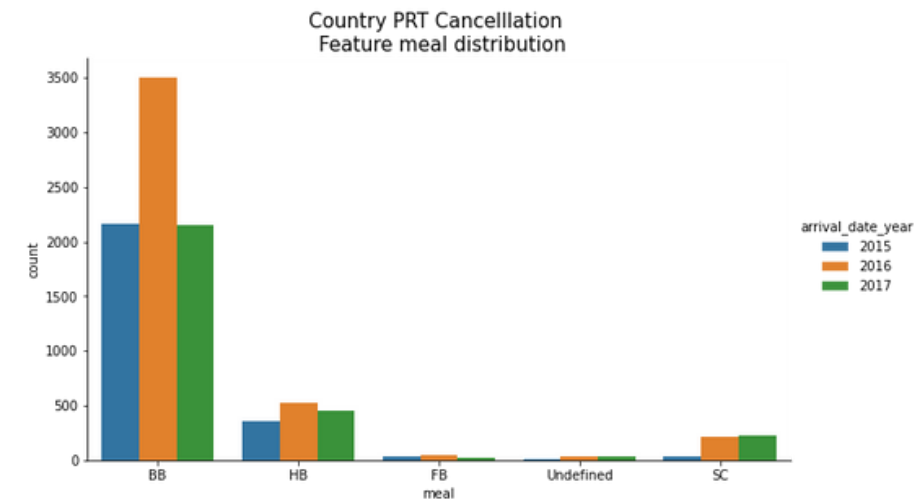
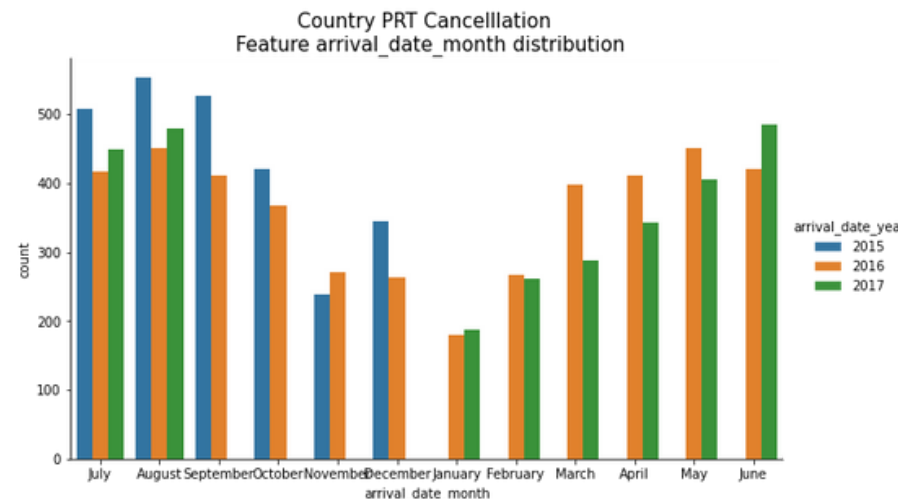
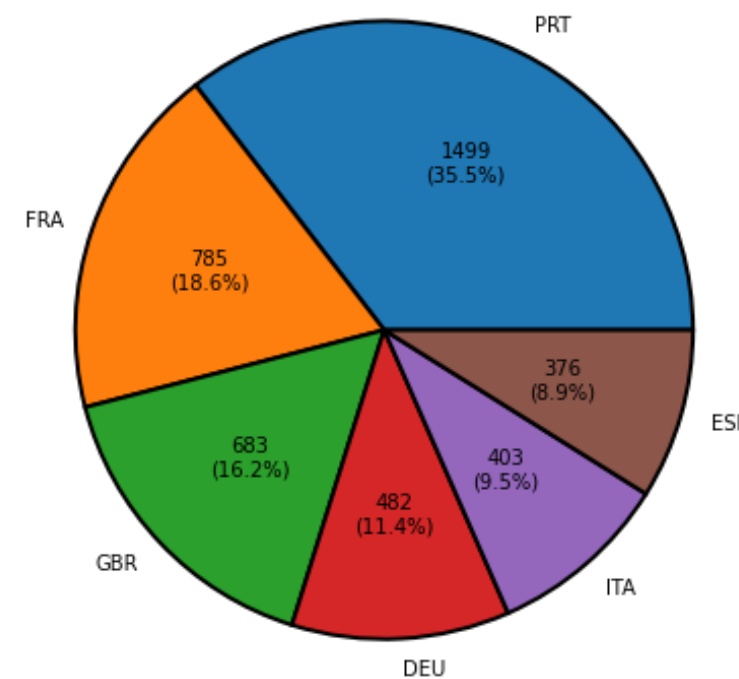
ANALYSIS OF TOP CANCEL COUNTRY MOST LIKE CHOICE & BEHAVIOUR

City Hotel Top Six Country Cancellation

Top6_cancel%_2016



Top6_Cancel%_2017



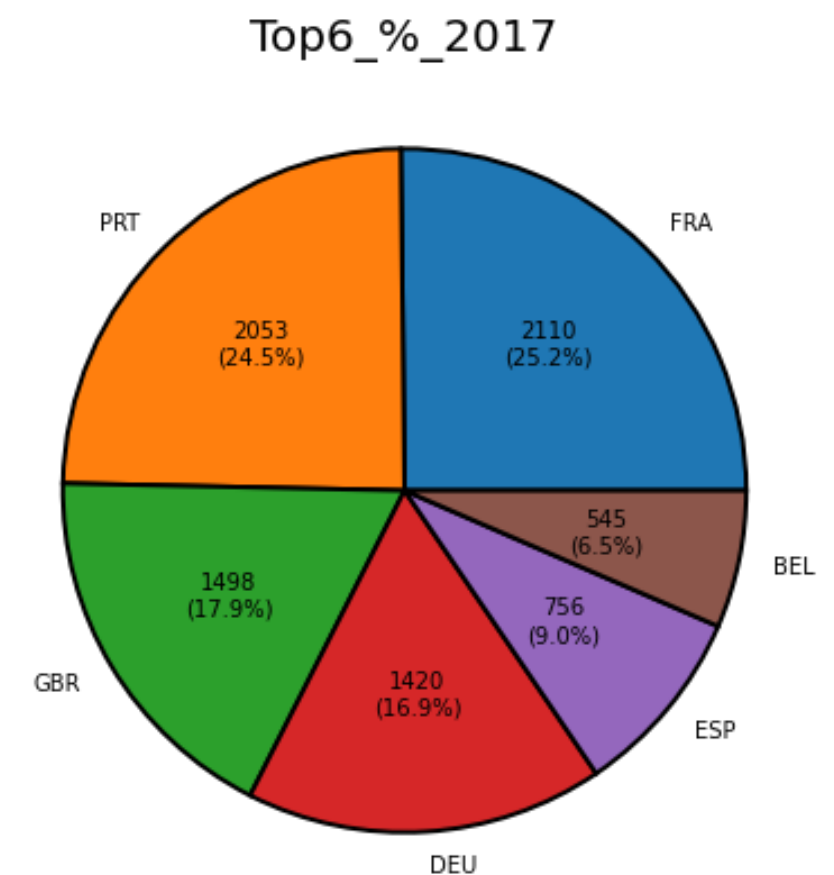
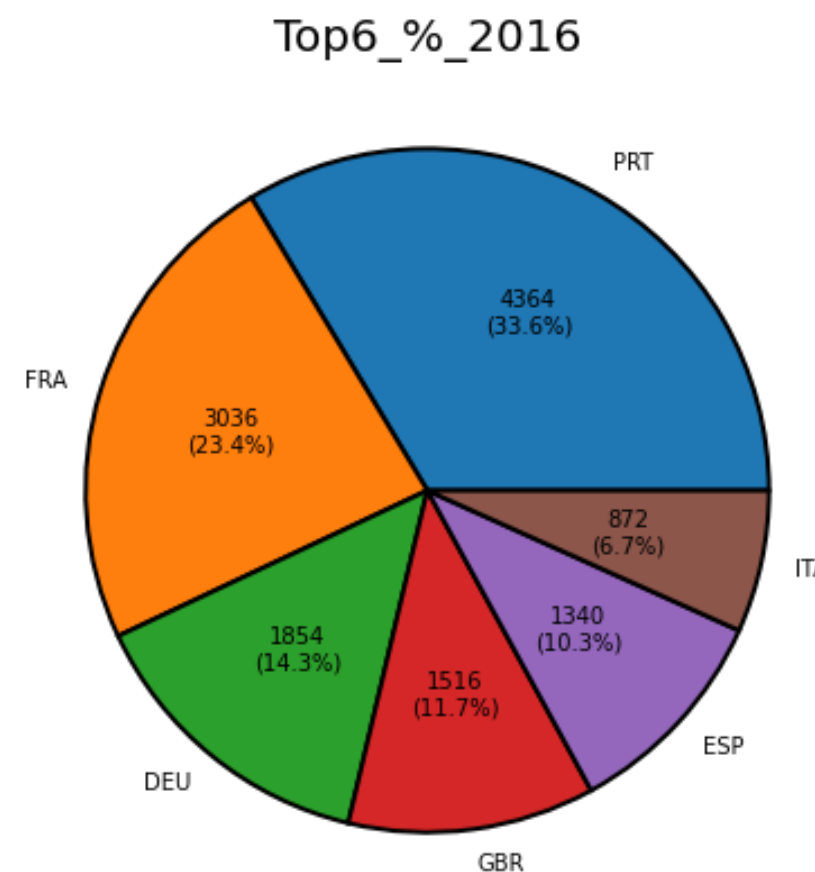
- 1) PRT is a country who has achieved a first position in cancellation list.
- 2) July & August is the month for cancellation is very high.
- 3) BB is meal, reserved room type is A, customer type is Transient, market segment is online TA is the first choice selection of Cancellation customers..

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ANALYSIS OF TOP DEMANDED COUNTRY

High revenue is generated in this top six country i.e. PRT, FRA, DEU, GBR, ESP & ITA but the cancellation is also high among this same top six country. Highly demanded and highly cancellation tie up between them that means hotel authority is not give satisfactory service of some of the particular market segment or customer type. That can lead drag back our business to negative growth.

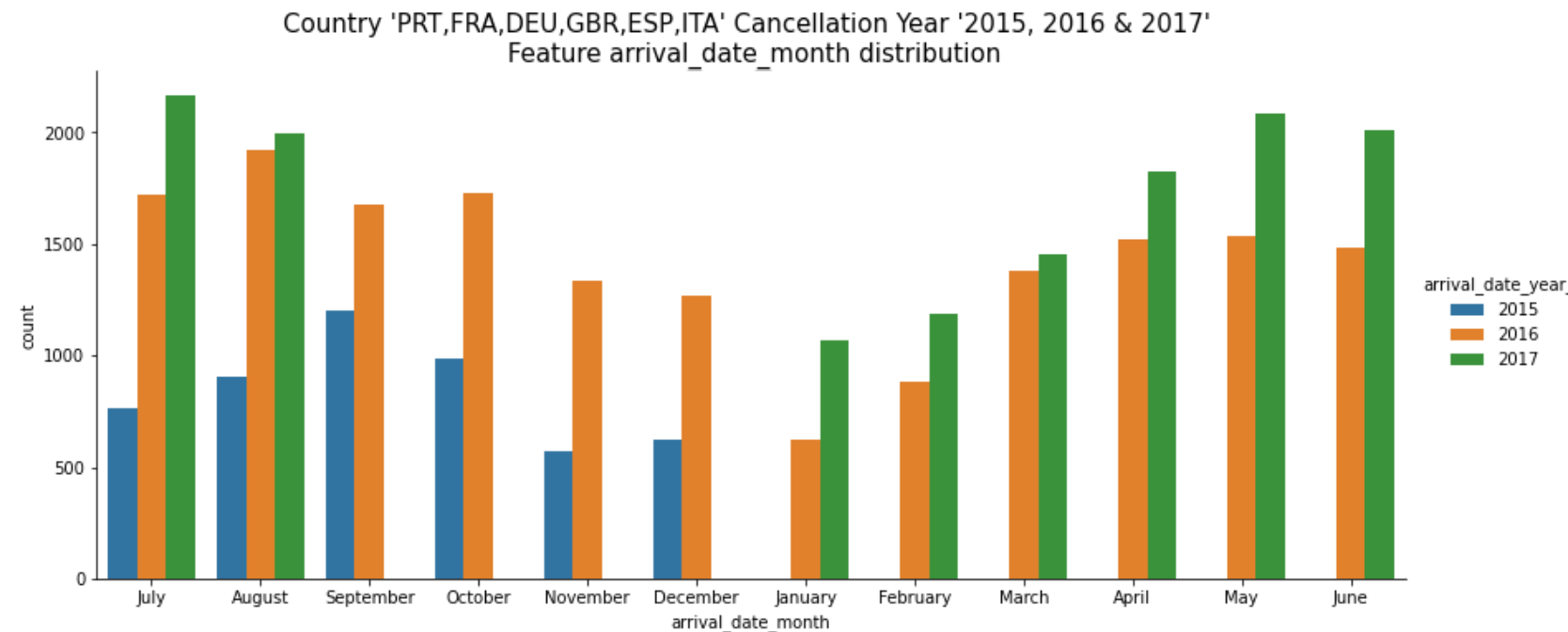
City Hotel Top six Country Demanded Hotel



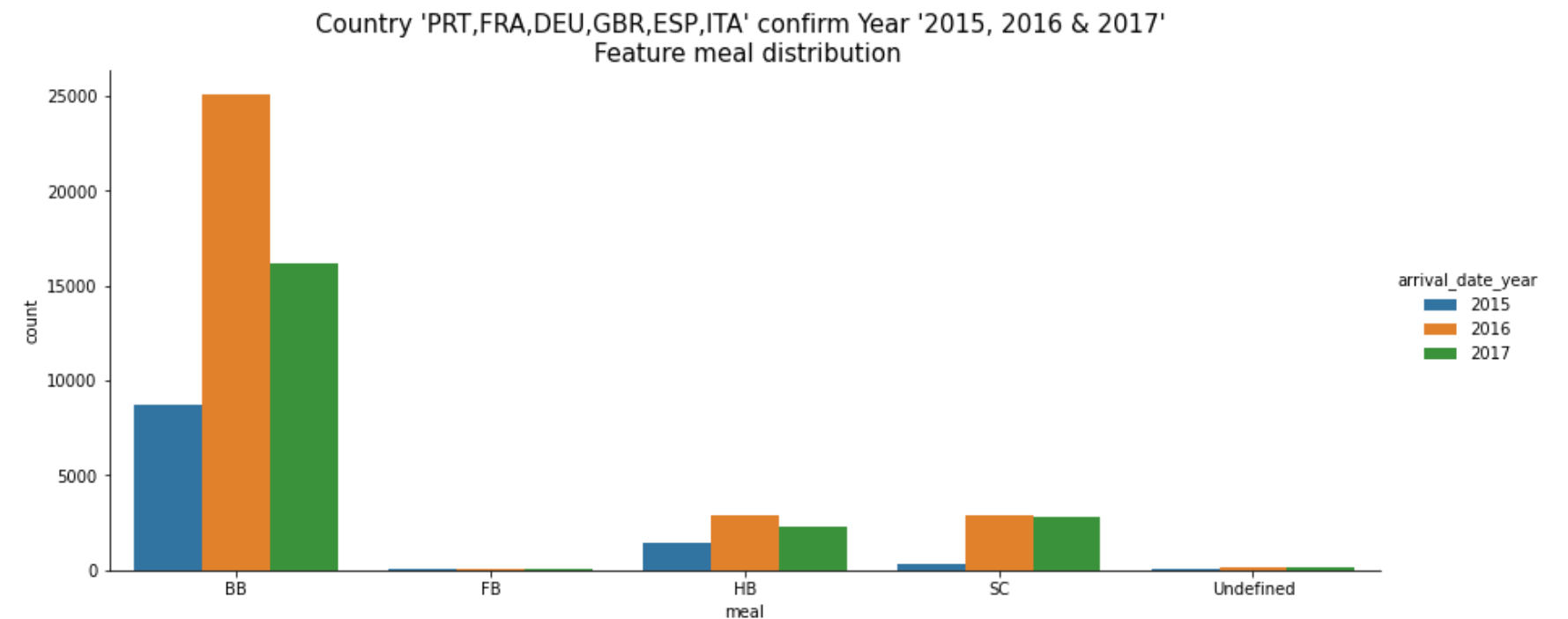
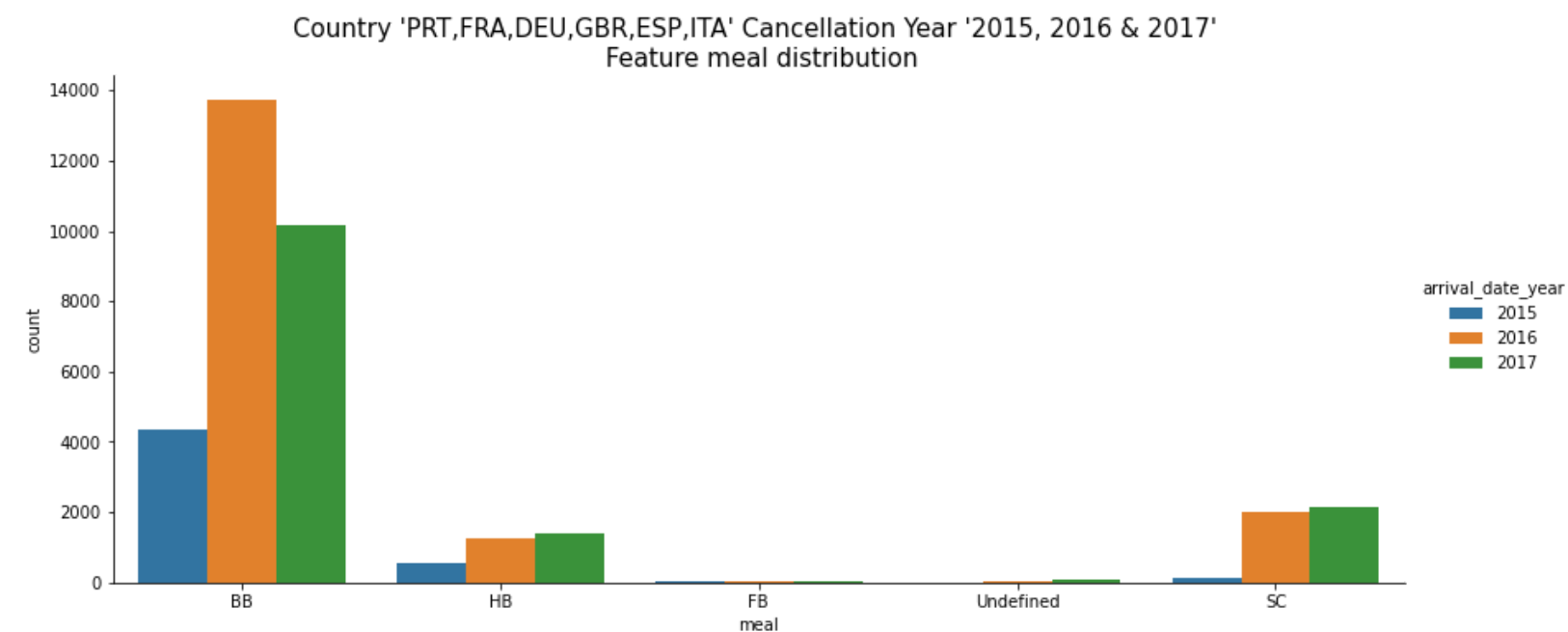
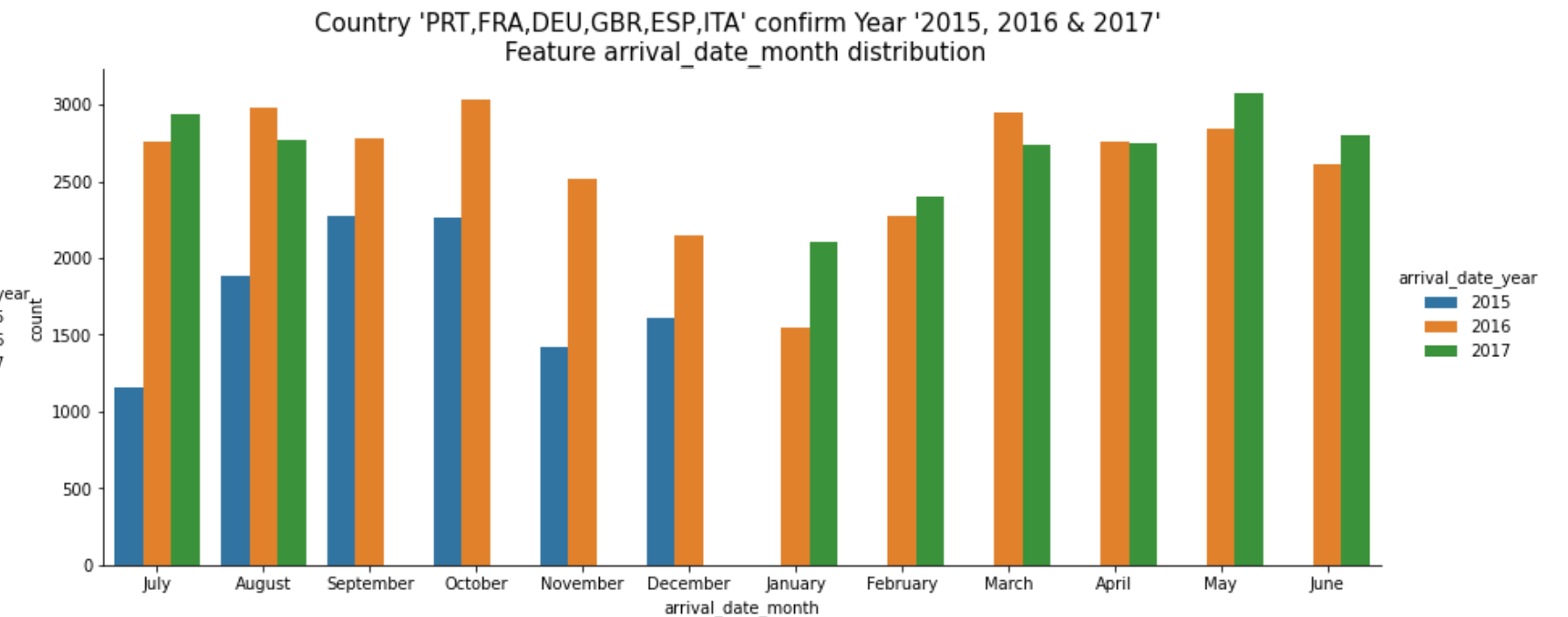
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ANALYSIS OF TOP SIX TIE UP COUNTRY CUSTOMER CHOICE & BEHAVIOUR

CANCELLATION



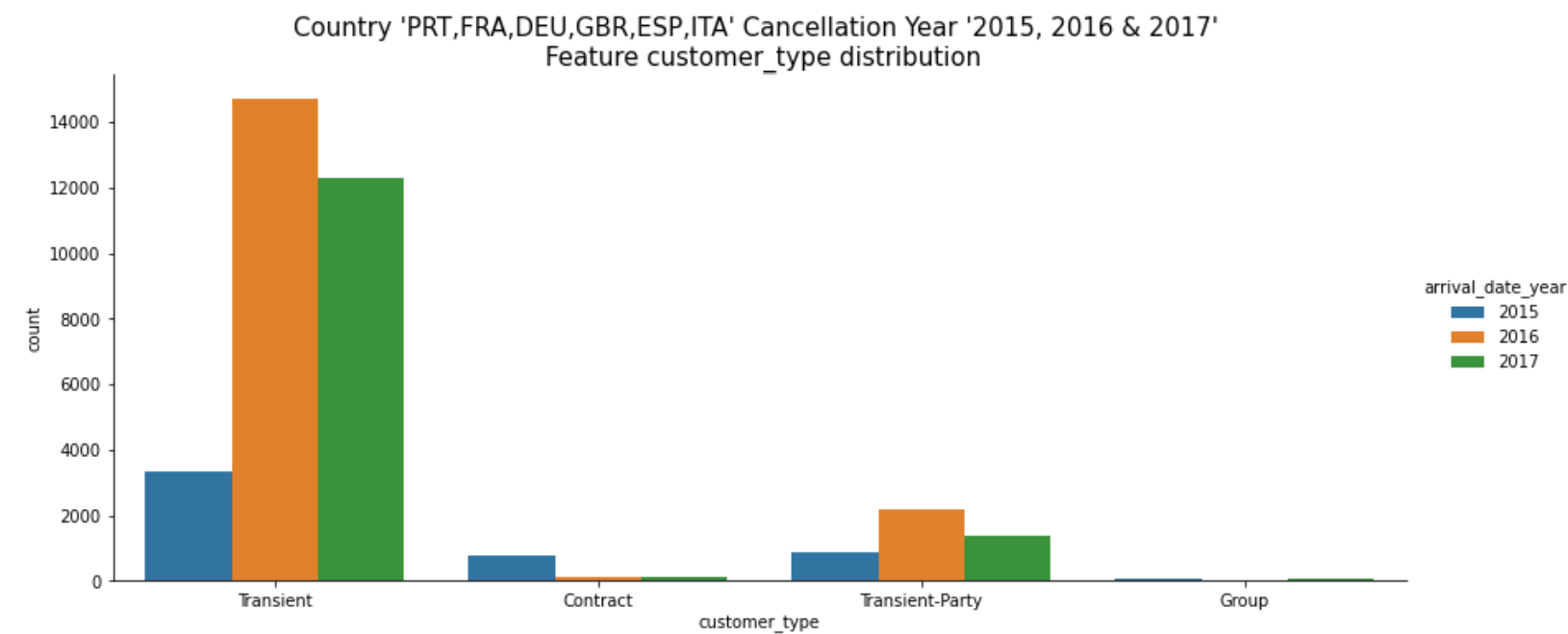
CONFIRM



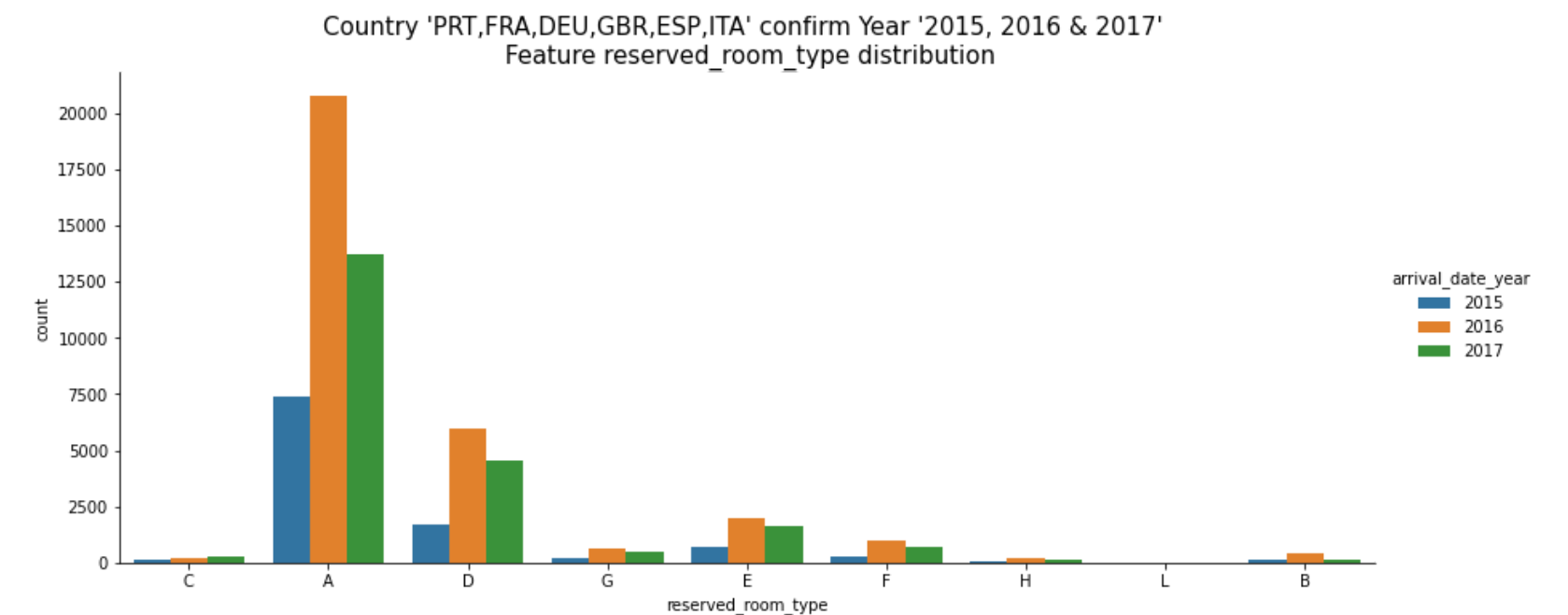
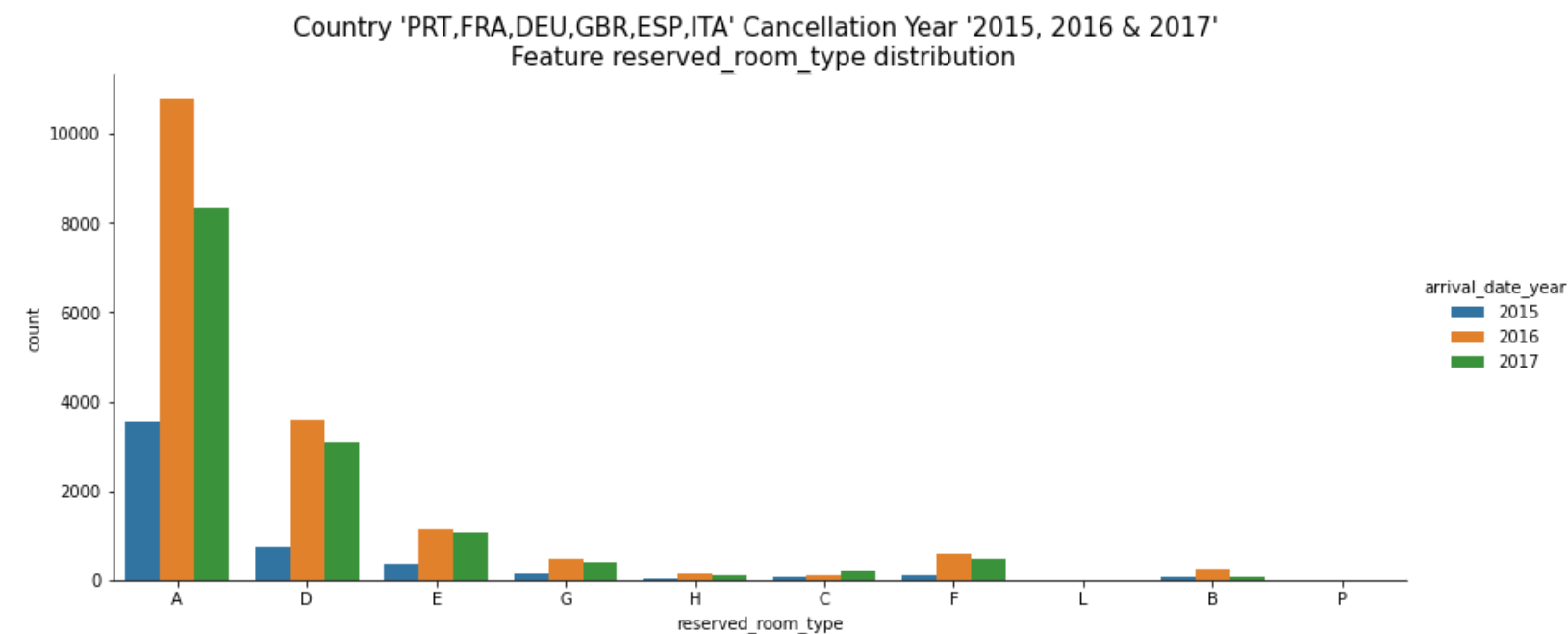
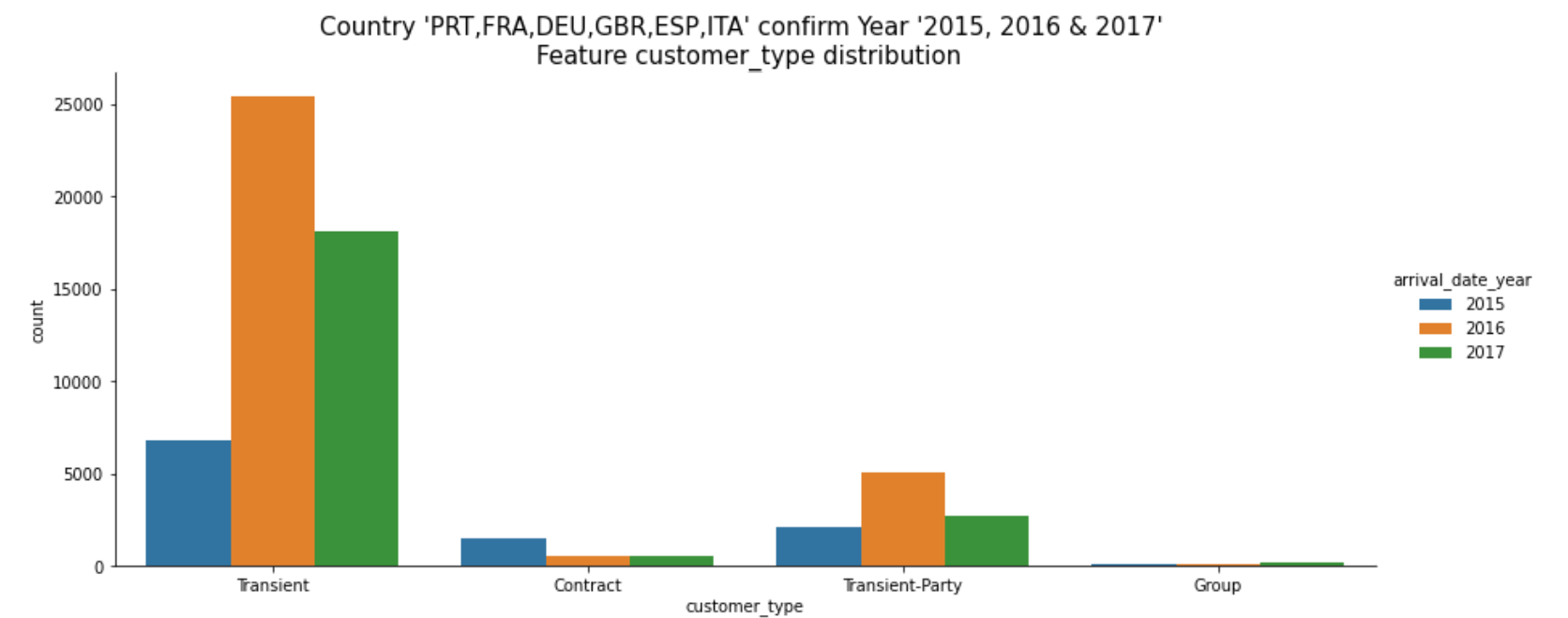
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CANCELLATION



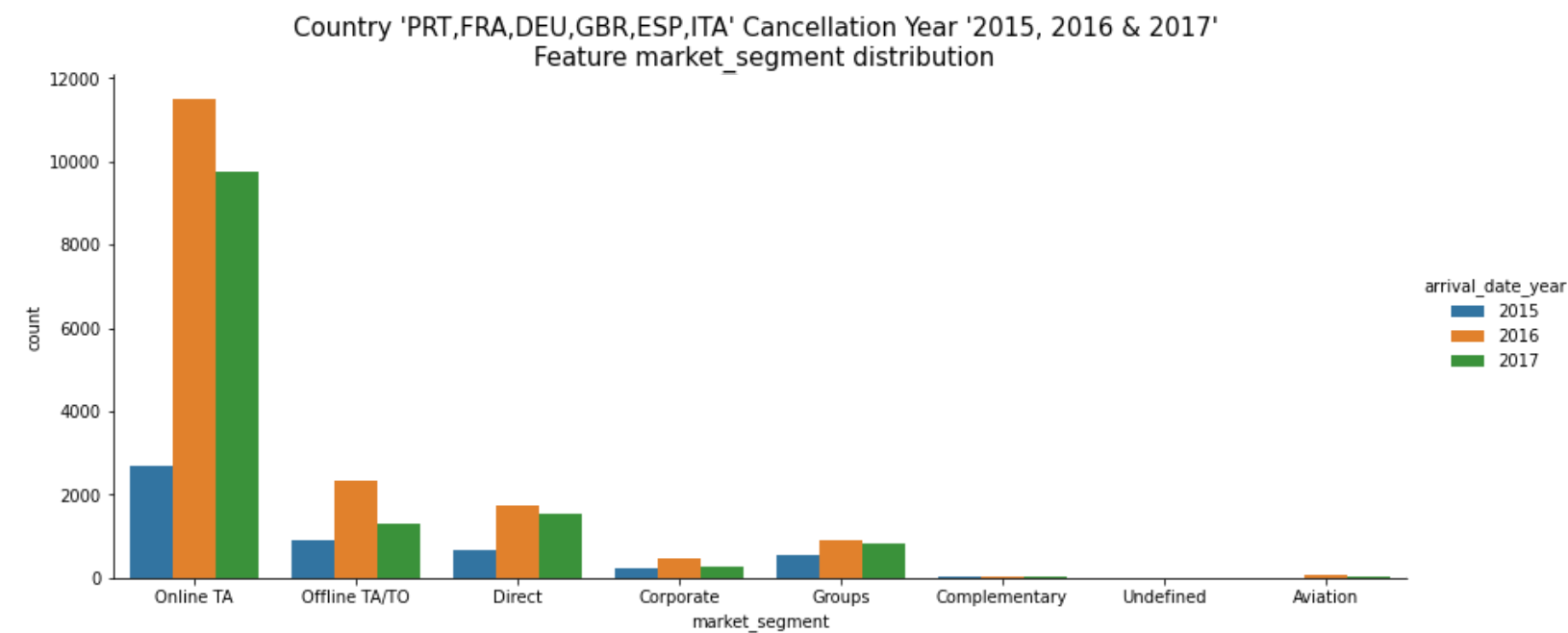
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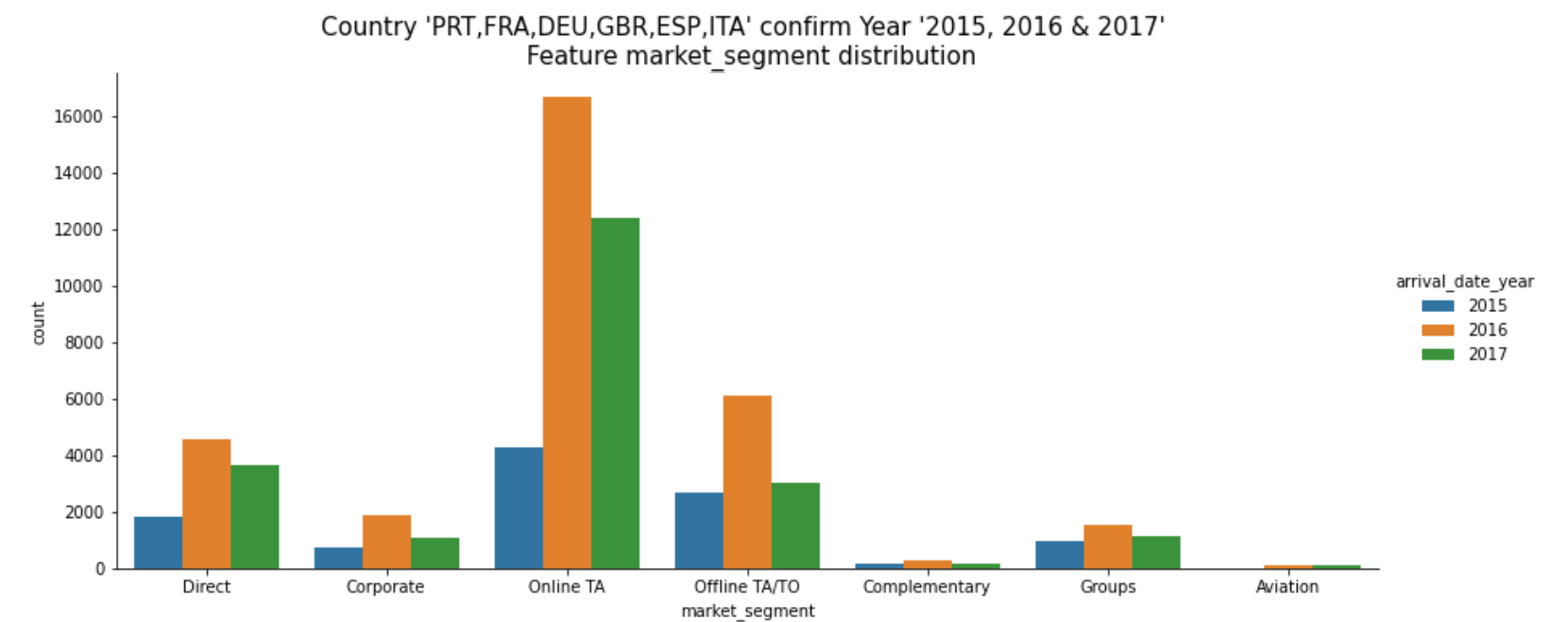
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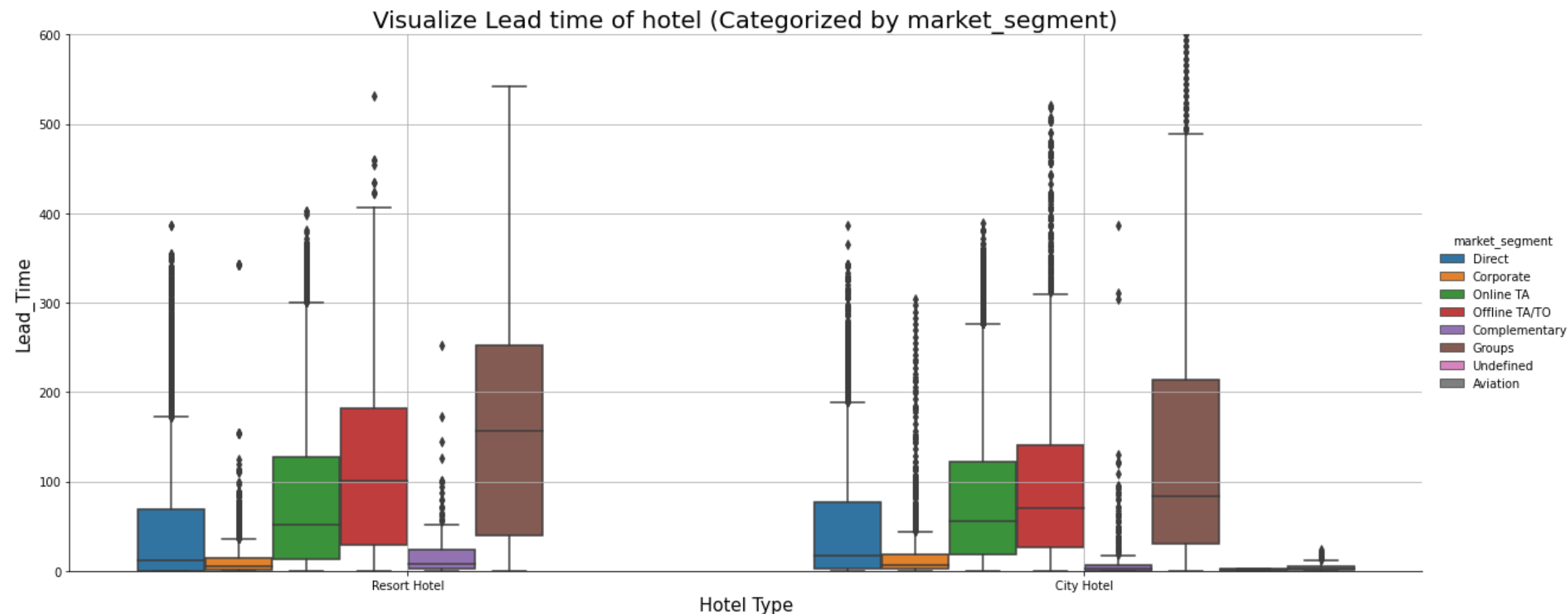
CONFIRM



Above comparison of collected information we found out cancellation and confirm have exactly similar type of behaviour found out so control the cancellation advice to client design or update policy of particular specify for online market segment & Transient customer type for cancellation.

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ANALYSIS OF BEST TIME TO BOOK THE HOTEL

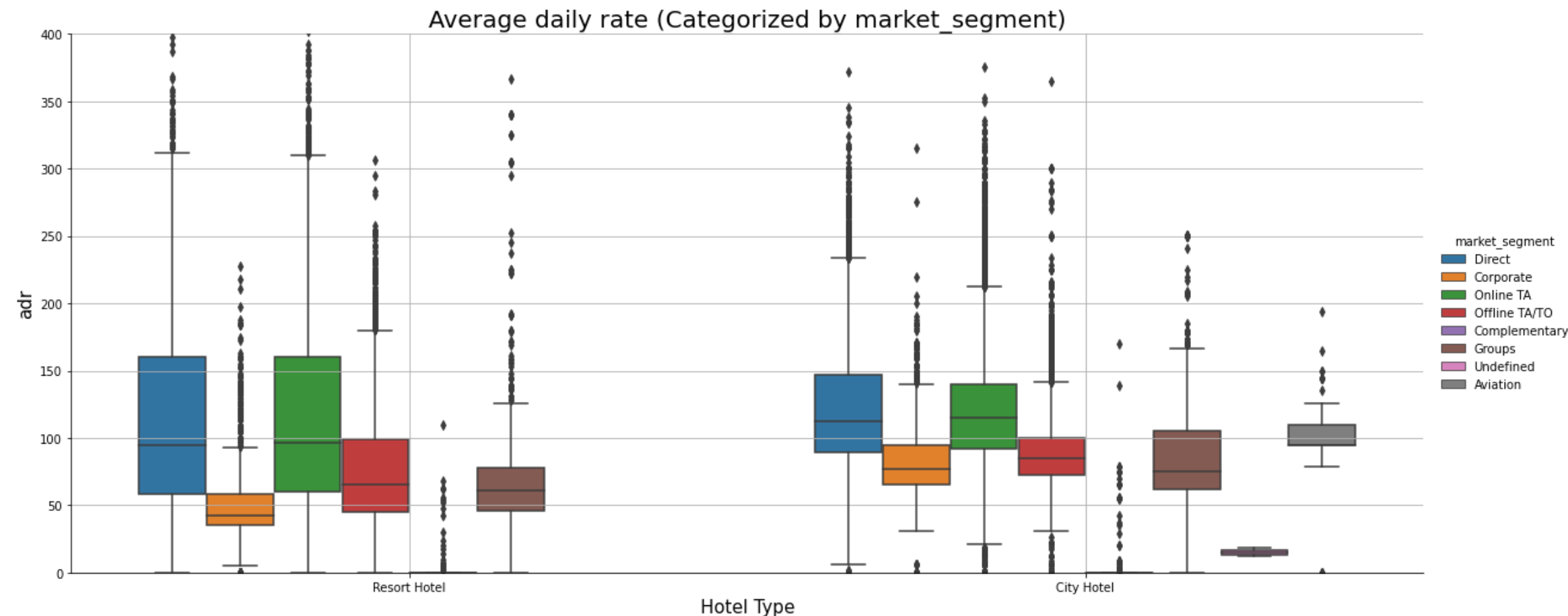


The gained insights for above chart help to creating a positive business impact is to give the reminder for regular customers of market segment is it your right time to book the hotel with out additional cost and avoid rush.

market_segment	hotel	lead_time
Aviation	City Hotel	6.00
Complementary	City Hotel	8.00
Complementary	Resort Hotel	23.00
Corporate	City Hotel	20.00
Corporate	Resort Hotel	16.00
Direct	City Hotel	80.00
Direct	Resort Hotel	72.44
Groups	City Hotel	215.00
Groups	Resort Hotel	253.00
Offline TA/TO	City Hotel	144.00
Offline TA/TO	Resort Hotel	185.00
Online TA	City Hotel	125.00
Online TA	Resort Hotel	132.00
Undefined	City Hotel	1.76

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ANALYSIS OF AVERAGE DAILY RATE

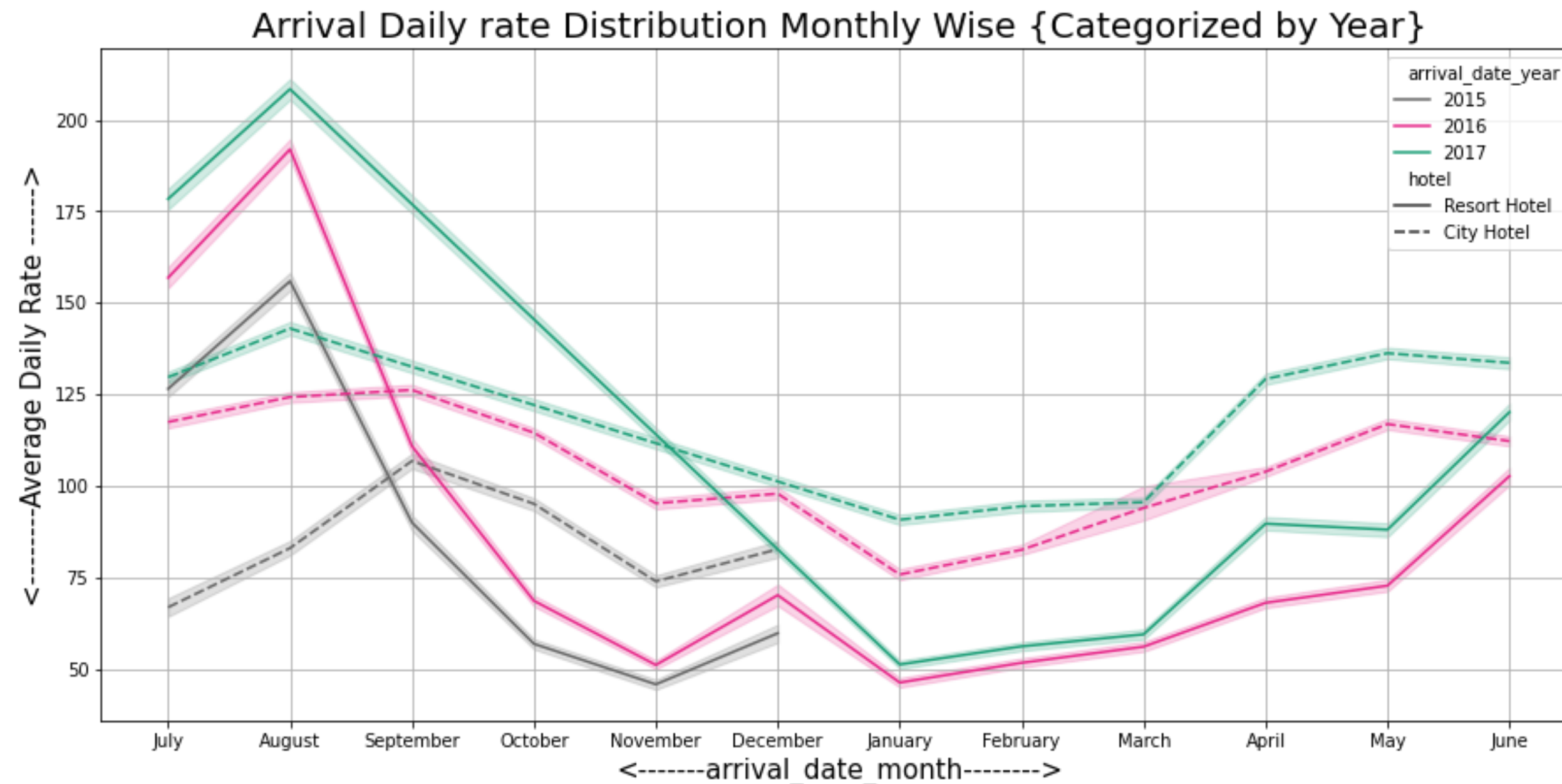


Market segment (Direct, Corporate, Online TA, Offline TA/TO & Group) that is the back bone of hotels for major role to increase revenue. Majorly focused for the this cluster of market segment to make attractive offers for increase the more revenue.

market_segment	hotel	adr
Aviation	City Hotel	95.000
Complementary	City Hotel	0.000
Complementary	Resort Hotel	0.000
Corporate	City Hotel	77.000
Corporate	Resort Hotel	42.000
Direct	City Hotel	112.500
Direct	Resort Hotel	95.000
Groups	City Hotel	75.000
Groups	Resort Hotel	61.000
Offline TA/TO	City Hotel	84.670
Offline TA/TO	Resort Hotel	65.475
Online TA	City Hotel	115.000
Online TA	Resort Hotel	96.315
Undefined	City Hotel	15.000

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ANALYSIS OF AVERAGE DAILY RATE

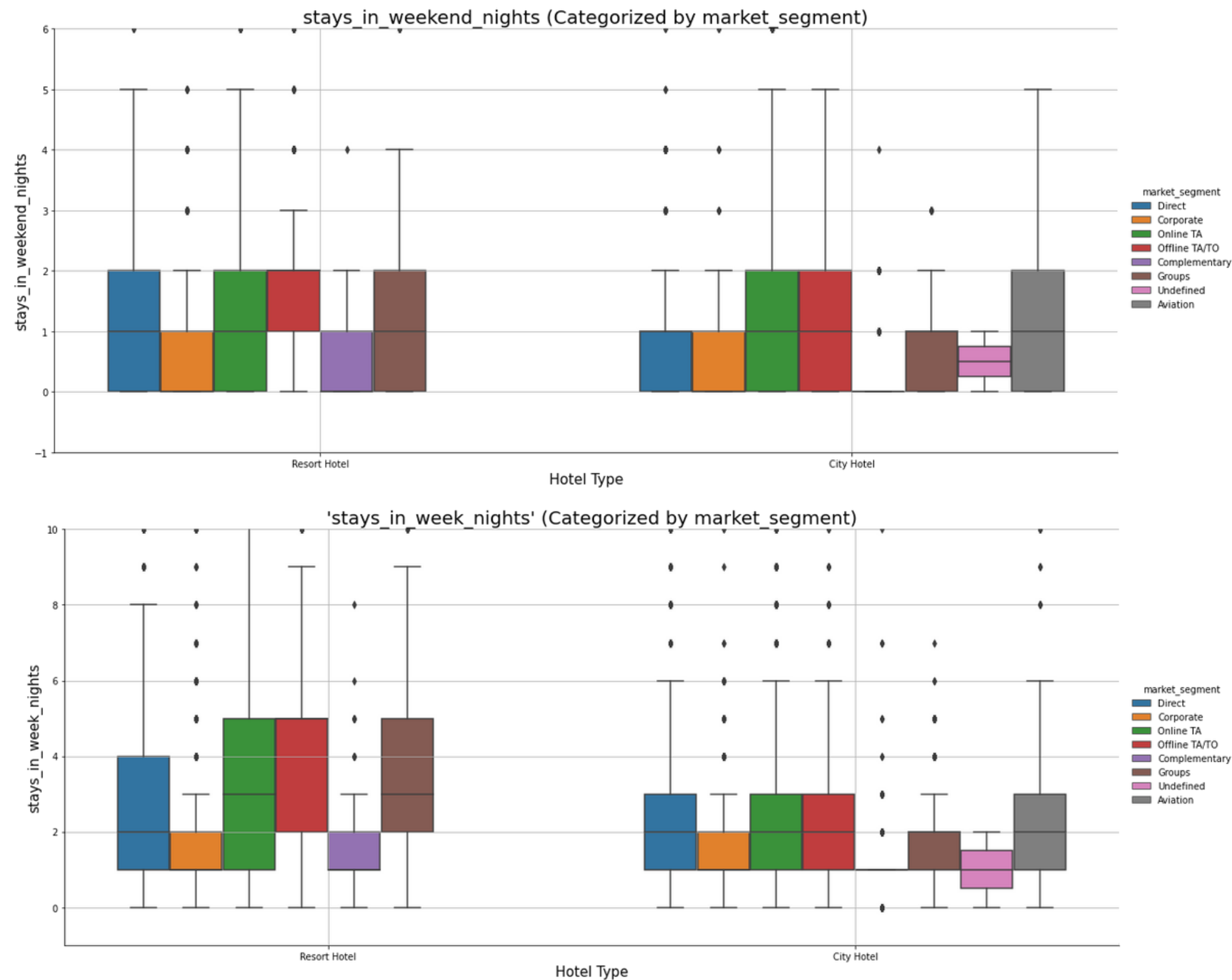


Fall down of revenue between from the end of October to end of march with in this six month give some more offers to customers to increase the revenue of this six month. if revenue can increase this defined tenure all operation & business run very smoothly.

hotel	arrival_date_month	arrival_date_year	adr
City Hotel	October	2016	110.000
City Hotel	October	2015	94.500
City Hotel	March	2017	91.800
City Hotel	February	2017	90.000
City Hotel	December	2016	89.195
City Hotel	November	2016	88.400
City Hotel	January	2017	88.000
City Hotel	March	2016	85.850
City Hotel	February	2016	80.000
City Hotel	January	2016	77.375
City Hotel	December	2015	77.250
City Hotel	November	2015	72.250
Resort Hotel	October	2016	63.400
Resort Hotel	March	2017	60.000
Resort Hotel	December	2016	57.750
Resort Hotel	October	2015	55.000
Resort Hotel	March	2016	51.400
Resort Hotel	February	2017	50.000
Resort Hotel	December	2015	49.035
Resort Hotel	February	2016	48.000
Resort Hotel	November	2016	48.000
Resort Hotel	January	2017	48.000
Resort Hotel	January	2016	44.800
Resort Hotel	November	2015	43.000

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ANALYSIS OF MARKET SEGMENT BEHAVIOUR STAY AT WEEK & WEEKEND NIGHT

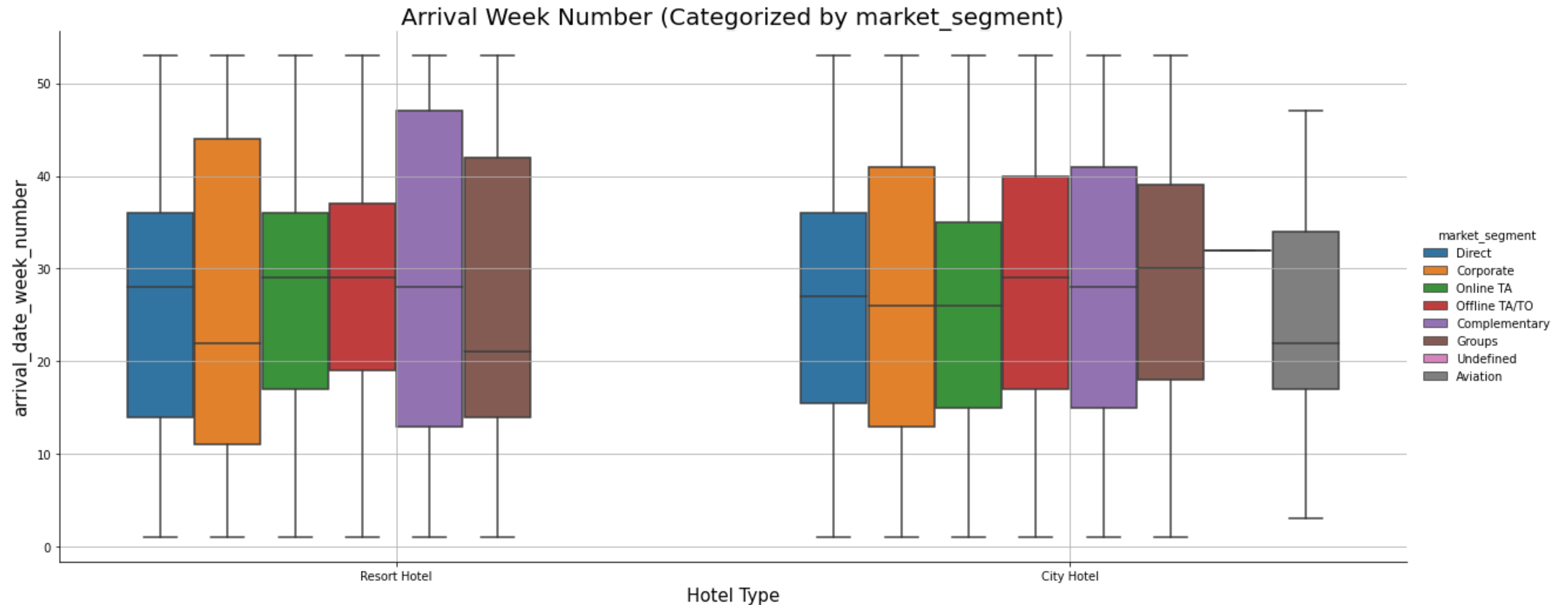


The gained insight help creating a positive business impact is not create any offer or discount if any of market segment is stay 2 weekend nights.

The gained insight help creating a positive business impact is not create any offer or discount if any of market segment is stay 1 to 5 week nights.

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ANALYSIS ENGAGEMENT OF BUSIEST WEEKS



To send the report to hotels please be pro active this weeks numbers with full loaded employee to takecare care of assigned guests.

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SUGGEST THE CLIENT TO ACHIEVE BUSINESS OBJECTIVE

- 1) Online TA market segment is drag our business growth because cancellation is to high from particular that segment. Changes & update your company policy particular for that segment.
- 2) Rush is very low in between from end of october to the end of march from this particular six month create some special attractive offer to boost revenue i.e. average daily rate.
- 3) For stay week night 1 to 5 days & weekend night 2 days for this range not create any special offers more that create some offers.
- 4) From 10 to 45 week number is the busiest weeks for entire year as per our data.
- 5) Market segment (Direct,Corporate,Online TA,Offline TA/TO & Group) that is the back bone of hotels for major role to boost hotel revenue.
- 6) For particular market segment type send special request is it best to book the hotel to avoid rush if you plan to visit for business trip & holiday trip.

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CONCLUSION

Majorly focused in this hotel booking analysis to control the high cancellation and take care of particular those market segment which play a key role of generate revenue. All analysis is based on the data provided from client end that is based on the year 2015 to 2017. All analysis is based on particular this time frame.

Attach link () of GitHub is a Notebook that .ipynb file contain complete analysis & completely self explanatory point wise step to steps all explained in very well manner and run all cell in one go only thing is you have only plugin the correct path of dataset csv file.

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If any Query please feel to free touch with mentioned email ids.

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