HOTEL BOOKING - DATA ANALYSIS

IMPORT LIBRARIES FOR DATA ANALYSIS

```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings('ignore')
```

LOADING THE DATASET

```
data=pd.read_csv("C:\\Users\\User\\Downloads\\hotel_bookings 2.csv")
```

EXPLORATORY DATA ANALYSIS

```
data.head()
```

```
          hotel  is_canceled  lead_time  arrival_date_year
arrival_date_month  \
0  Resort Hotel            0        342               2015
July
1  Resort Hotel            0        737               2015
July
2  Resort Hotel            0          7               2015
July
3  Resort Hotel            0         13               2015
July
4  Resort Hotel            0         14               2015
July

   arrival_date_week_number  arrival_date_day_of_month  \
0                        27                          1
1                        27                          1
2                        27                          1
3                        27                          1
4                        27                          1

   stays_in_weekend_nights  stays_in_week_nights  adults  ...
deposit_type  \
0                        0                     0       2  ...    No
Deposit
1                        0                     0       2  ...    No
Deposit
2                        0                     1       1  ...    No
Deposit
```

```
3                         0                     1       1  ...    No
Deposit
4                         0                     2       2  ...    No
Deposit

   agent company days_in_waiting_list customer_type   adr  \
0    NaN     NaN                    0     Transient   0.0
1    NaN     NaN                    0     Transient   0.0
2    NaN     NaN                    0     Transient  75.0
3  304.0     NaN                    0     Transient  75.0
4  240.0     NaN                    0     Transient  98.0

   required_car_parking_spaces  total_of_special_requests
reservation_status  \
0                            0                          0
Check-Out
1                            0                          0
Check-Out
2                            0                          0
Check-Out
3                            0                          0
Check-Out
4                            0                          1
Check-Out

  reservation_status_date
0                1/7/2015
1                1/7/2015
2                2/7/2015
3                2/7/2015
4                3/7/2015

[5 rows x 32 columns]

data.tail()

             hotel  is_canceled  lead_time  arrival_date_year  \
119385  City Hotel            0         23               2017
119386  City Hotel            0        102               2017
119387  City Hotel            0         34               2017
119388  City Hotel            0        109               2017
119389  City Hotel            0        205               2017

       arrival_date_month  arrival_date_week_number  \
119385             August                        35
119386             August                        35
119387             August                        35
119388             August                        35
119389             August                        35
```

```
        arrival_date_day_of_month  stays_in_weekend_nights  \
119385                         30                        2
119386                         31                        2
119387                         31                        2
119388                         31                        2
119389                         29                        2

        stays_in_week_nights  adults  ...  deposit_type  agent company
\
119385                     5       2  ...    No Deposit  394.0     NaN

119386                     5       3  ...    No Deposit    9.0     NaN

119387                     5       2  ...    No Deposit    9.0     NaN

119388                     5       2  ...    No Deposit   89.0     NaN

119389                     7       2  ...    No Deposit    9.0     NaN


       days_in_waiting_list customer_type     adr  \
119385                    0     Transient   96.14
119386                    0     Transient  225.43
119387                    0     Transient  157.71
119388                    0     Transient  104.40
119389                    0     Transient  151.20

        required_car_parking_spaces  total_of_special_requests  \
119385                            0                          0
119386                            0                          2
119387                            0                          4
119388                            0                          0
119389                            0                          2

        reservation_status reservation_status_date
119385           Check-Out                6/9/2017
119386           Check-Out                7/9/2017
119387           Check-Out                7/9/2017
119388           Check-Out                7/9/2017
119389           Check-Out                7/9/2017

[5 rows x 32 columns]

data.shape

(119390, 32)

data.columns

Index(['hotel', 'is_canceled', 'lead_time', 'arrival_date_year',
       'arrival_date_month', 'arrival_date_week_number',
```

```
       'arrival_date_day_of_month', 'stays_in_weekend_nights',
       'stays_in_week_nights', 'adults', 'children', 'babies', 'meal',
       'country', 'market_segment', 'distribution_channel',
       'is_repeated_guest', 'previous_cancellations',
       'previous_bookings_not_canceled', 'reserved_room_type',
       'assigned_room_type', 'booking_changes', 'deposit_type',
'agent',
       'company', 'days_in_waiting_list', 'customer_type', 'adr',
       'required_car_parking_spaces', 'total_of_special_requests',
       'reservation_status', 'reservation_status_date'],
      dtype='object')
```

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 119390 entries, 0 to 119389
Data columns (total 32 columns):
 #   Column                          Non-Null Count   Dtype  
---  ------                          --------------   -----  
 0   hotel                           119390 non-null  object 
 1   is_canceled                     119390 non-null  int64  
 2   lead_time                       119390 non-null  int64  
 3   arrival_date_year               119390 non-null  int64  
 4   arrival_date_month              119390 non-null  object 
 5   arrival_date_week_number        119390 non-null  int64  
 6   arrival_date_day_of_month       119390 non-null  int64  
 7   stays_in_weekend_nights         119390 non-null  int64  
 8   stays_in_week_nights            119390 non-null  int64  
 9   adults                          119390 non-null  int64  
 10  children                        119386 non-null  float64
 11  babies                          119390 non-null  int64  
 12  meal                            119390 non-null  object 
 13  country                         118902 non-null  object 
 14  market_segment                  119390 non-null  object 
 15  distribution_channel            119390 non-null  object 
 16  is_repeated_guest               119390 non-null  int64  
 17  previous_cancellations          119390 non-null  int64  
 18  previous_bookings_not_canceled  119390 non-null  int64  
 19  reserved_room_type              119390 non-null  object 
 20  assigned_room_type              119390 non-null  object 
 21  booking_changes                 119390 non-null  int64  
 22  deposit_type                    119390 non-null  object 
 23  agent                           103050 non-null  float64
 24  company                         6797 non-null    float64
 25  days_in_waiting_list            119390 non-null  int64  
 26  customer_type                   119390 non-null  object 
 27  adr                             119390 non-null  float64
 28  required_car_parking_spaces     119390 non-null  int64  
 29  total_of_special_requests       119390 non-null  int64  
 30  reservation_status              119390 non-null  object 
```

```
 31  reservation_status_date         119390 non-null  object
dtypes: float64(4), int64(16), object(12)
memory usage: 29.1+ MB
```

here we want to change the datatype of column (reservation_status_date) from object to timedate

```
data['reservation_status_date']=pd.to_datetime(data['reservation_statu
s_date'],dayfirst=True)

data.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 119390 entries, 0 to 119389
Data columns (total 32 columns):
 #   Column                          Non-Null Count   Dtype
---  ------                          --------------   -----
 0   hotel                           119390 non-null  object
 1   is_canceled                     119390 non-null  int64
 2   lead_time                       119390 non-null  int64
 3   arrival_date_year               119390 non-null  int64
 4   arrival_date_month              119390 non-null  object
 5   arrival_date_week_number        119390 non-null  int64
 6   arrival_date_day_of_month       119390 non-null  int64
 7   stays_in_weekend_nights         119390 non-null  int64
 8   stays_in_week_nights            119390 non-null  int64
 9   adults                          119390 non-null  int64
 10  children                        119386 non-null  float64
 11  babies                          119390 non-null  int64
 12  meal                            119390 non-null  object
 13  country                         118902 non-null  object
 14  market_segment                  119390 non-null  object
 15  distribution_channel            119390 non-null  object
 16  is_repeated_guest               119390 non-null  int64
 17  previous_cancellations          119390 non-null  int64
 18  previous_bookings_not_canceled  119390 non-null  int64
 19  reserved_room_type              119390 non-null  object
 20  assigned_room_type              119390 non-null  object
 21  booking_changes                 119390 non-null  int64
 22  deposit_type                    119390 non-null  object
 23  agent                           103050 non-null  float64
 24  company                         6797 non-null    float64
 25  days_in_waiting_list            119390 non-null  int64
 26  customer_type                   119390 non-null  object
 27  adr                             119390 non-null  float64
 28  required_car_parking_spaces     119390 non-null  int64
 29  total_of_special_requests       119390 non-null  int64
 30  reservation_status              119390 non-null  object
 31  reservation_status_date         119390 non-null  datetime64[ns]
```

```
dtypes: datetime64[ns](1), float64(4), int64(16), object(11)
memory usage: 29.1+ MB
```

```
data.describe(include='object')
```

```
              hotel arrival_date_month    meal country
market_segment  \
count        119390             119390  119390  118902         119390

unique            2                 12       5     177              8

top     City Hotel             August      BB     PRT      Online TA

freq          79330              13877   92310   48590          56477


       distribution_channel reserved_room_type assigned_room_type  \
count                119390             119390              119390
unique                    5                 10                  12
top                  TA/TO                  A                   A
freq                  97870              85994               74053

       deposit_type customer_type reservation_status
count        119390        119390             119390
unique            3             4                  3
top      No Deposit     Transient          Check-Out
freq         104641         89613              75166
```

check the how many unique values present in categorical columns

```
for col in data.describe(include='object').columns:
    print(col)
    print(data[col].unique())
    print('-'*80)
```

```
hotel
['Resort Hotel' 'City Hotel']
--------------------------------------------------------------------------------
----------
arrival_date_month
['July' 'August' 'September' 'October' 'November' 'December' 'January'
 'February' 'March' 'April' 'May' 'June']
--------------------------------------------------------------------------------
----------
meal
['BB' 'FB' 'HB' 'SC' 'Undefined']
--------------------------------------------------------------------------------
----------
country
['PRT' 'GBR' 'USA' 'ESP' 'IRL' 'FRA' nan 'ROU' 'NOR' 'OMN' 'ARG' 'POL'
```

```
 'DEU' 'BEL' 'CHE' 'CN' 'GRC' 'ITA' 'NLD' 'DNK' 'RUS' 'SWE' 'AUS'
'EST'
 'CZE' 'BRA' 'FIN' 'MOZ' 'BWA' 'LUX' 'SVN' 'ALB' 'IND' 'CHN' 'MEX'
'MAR'
 'UKR' 'SMR' 'LVA' 'PRI' 'SRB' 'CHL' 'AUT' 'BLR' 'LTU' 'TUR' 'ZAF'
'AGO'
 'ISR' 'CYM' 'ZMB' 'CPV' 'ZWE' 'DZA' 'KOR' 'CRI' 'HUN' 'ARE' 'TUN'
'JAM'
 'HRV' 'HKG' 'IRN' 'GEO' 'AND' 'GIB' 'URY' 'JEY' 'CAF' 'CYP' 'COL'
'GGY'
 'KWT' 'NGA' 'MDV' 'VEN' 'SVK' 'FJI' 'KAZ' 'PAK' 'IDN' 'LBN' 'PHL'
'SEN'
 'SYC' 'AZE' 'BHR' 'NZL' 'THA' 'DOM' 'MKD' 'MYS' 'ARM' 'JPN' 'LKA'
'CUB'
 'CMR' 'BIH' 'MUS' 'COM' 'SUR' 'UGA' 'BGR' 'CIV' 'JOR' 'SYR' 'SGP'
'BDI'
 'SAU' 'VNM' 'PLW' 'QAT' 'EGY' 'PER' 'MLT' 'MWI' 'ECU' 'MDG' 'ISL'
'UZB'
 'NPL' 'BHS' 'MAC' 'TGO' 'TWN' 'DJI' 'STP' 'KNA' 'ETH' 'IRQ' 'HND'
'RWA'
 'KHM' 'MCO' 'BGD' 'IMN' 'TJK' 'NIC' 'BEN' 'VGB' 'TZA' 'GAB' 'GHA'
'TMP'
 'GLP' 'KEN' 'LIE' 'GNB' 'MNE' 'UMI' 'MYT' 'FRO' 'MMR' 'PAN' 'BFA'
'LBY'
 'MLI' 'NAM' 'BOL' 'PRY' 'BRB' 'ABW' 'AIA' 'SLV' 'DMA' 'PYF' 'GUY'
'LCA'
 'ATA' 'GTM' 'ASM' 'MRT' 'NCL' 'KIR' 'SDN' 'ATF' 'SLE' 'LAO']
--------------------------------------------------------------------
----------
market_segment
['Direct' 'Corporate' 'Online TA' 'Offline TA/TO' 'Complementary'
'Groups'
 'Undefined' 'Aviation']
--------------------------------------------------------------------
----------
distribution_channel
['Direct' 'Corporate' 'TA/TO' 'Undefined' 'GDS']
--------------------------------------------------------------------
----------
reserved_room_type
['C' 'A' 'D' 'E' 'G' 'F' 'H' 'L' 'P' 'B']
--------------------------------------------------------------------
----------
assigned_room_type
['C' 'A' 'D' 'E' 'G' 'F' 'I' 'B' 'H' 'P' 'L' 'K']
--------------------------------------------------------------------
----------
deposit_type
['No Deposit' 'Refundable' 'Non Refund']
```

```
--------------------------------------------------------------------------
----------
customer_type
['Transient' 'Contract' 'Transient-Party' 'Group']
--------------------------------------------------------------------------
----------
reservation_status
['Check-Out' 'Canceled' 'No-Show']
--------------------------------------------------------------------------
----------
```

check how many null values present in each column

```
Null_Count=data.isnull().sum().sort_values(ascending=False).head(5)
print(Null_Count)
```

```
company               112593
agent                  16340
country                  488
children                   4
reserved_room_type         0
dtype: int64
```

Remove the null values

```
data.drop(['company','agent'],axis=1,inplace=True)

data.dropna( inplace=True)

Null_Count=data.isnull().sum().sort_values(ascending=False)
print(Null_Count)
```

```
hotel                             0
is_canceled                       0
reservation_status                0
total_of_special_requests         0
required_car_parking_spaces       0
adr                               0
customer_type                     0
days_in_waiting_list              0
deposit_type                      0
booking_changes                   0
assigned_room_type                0
reserved_room_type                0
previous_bookings_not_canceled    0
previous_cancellations            0
is_repeated_guest                 0
distribution_channel              0
market_segment                    0
country                           0
```

```
meal                            0
babies                          0
children                        0
adults                          0
stays_in_week_nights            0
stays_in_weekend_nights         0
arrival_date_day_of_month       0
arrival_date_week_number        0
arrival_date_month              0
arrival_date_year               0
lead_time                       0
reservation_status_date         0
dtype: int64
```

summary statistics

```
data.describe()
```

```
         is_canceled      lead_time  arrival_date_year  \
count  118898.000000  118898.000000      118898.000000
mean        0.371352     104.311435        2016.157656
min         0.000000       0.000000        2015.000000
25%         0.000000      18.000000        2016.000000
50%         0.000000      69.000000        2016.000000
75%         1.000000     161.000000        2017.000000
max         1.000000     737.000000        2017.000000
std         0.483168     106.903309           0.707459

       arrival_date_week_number  arrival_date_day_of_month  \
count             118898.000000              118898.000000
mean                  27.166555                  15.800880
min                    1.000000                   1.000000
25%                   16.000000                   8.000000
50%                   28.000000                  16.000000
75%                   38.000000                  23.000000
max                   53.000000                  31.000000
std                   13.589971                   8.780324

       stays_in_weekend_nights  stays_in_week_nights         adults  \
count            118898.000000         118898.000000  118898.000000
mean                  0.928897              2.502145       1.858391
min                   0.000000              0.000000       0.000000
25%                   0.000000              1.000000       2.000000
50%                   1.000000              2.000000       2.000000
75%                   2.000000              3.000000       2.000000
max                  16.000000             41.000000      55.000000
std                   0.996216              1.900168       0.578576

            children         babies  is_repeated_guest  \
count  118898.000000  118898.000000      118898.000000
```

```
mean         0.104207       0.007948            0.032011
min          0.000000       0.000000            0.000000
25%          0.000000       0.000000            0.000000
50%          0.000000       0.000000            0.000000
75%          0.000000       0.000000            0.000000
max         10.000000      10.000000            1.000000
std          0.399172       0.097380            0.176029

       previous_cancellations  previous_bookings_not_canceled  \
count           118898.000000                   118898.000000
mean                 0.087142                        0.131634
min                  0.000000                        0.000000
25%                  0.000000                        0.000000
50%                  0.000000                        0.000000
75%                  0.000000                        0.000000
max                 26.000000                       72.000000
std                  0.845869                        1.484672

       booking_changes  days_in_waiting_list            adr  \
count    118898.000000         118898.000000  118898.000000
mean          0.221181              2.330754     102.003243
min           0.000000              0.000000      -6.380000
25%           0.000000              0.000000      70.000000
50%           0.000000              0.000000      95.000000
75%           0.000000              0.000000     126.000000
max          21.000000            391.000000    5400.000000
std           0.652785             17.630452      50.485862

       required_car_parking_spaces  total_of_special_requests  \
count                118898.000000              118898.000000
mean                      0.061885                   0.571683
min                       0.000000                   0.000000
25%                       0.000000                   0.000000
50%                       0.000000                   0.000000
75%                       0.000000                   1.000000
max                       8.000000                   5.000000
std                       0.244172                   0.792678

             reservation_status_date
count                         118898
mean   2016-07-30 07:37:53.336809984
min              2014-10-17 00:00:00
25%              2016-02-02 00:00:00
50%              2016-08-08 00:00:00
75%              2017-02-09 00:00:00
max              2017-09-14 00:00:00
std                              NaN
```

```
data=data[data['adr']<5000]
```

DATA ANALYSIS ADN VISUALIZATION

Check cancellation percentage

```
Cancelled_count=data['is_canceled'].value_counts()
print(Cancelled_count)
```

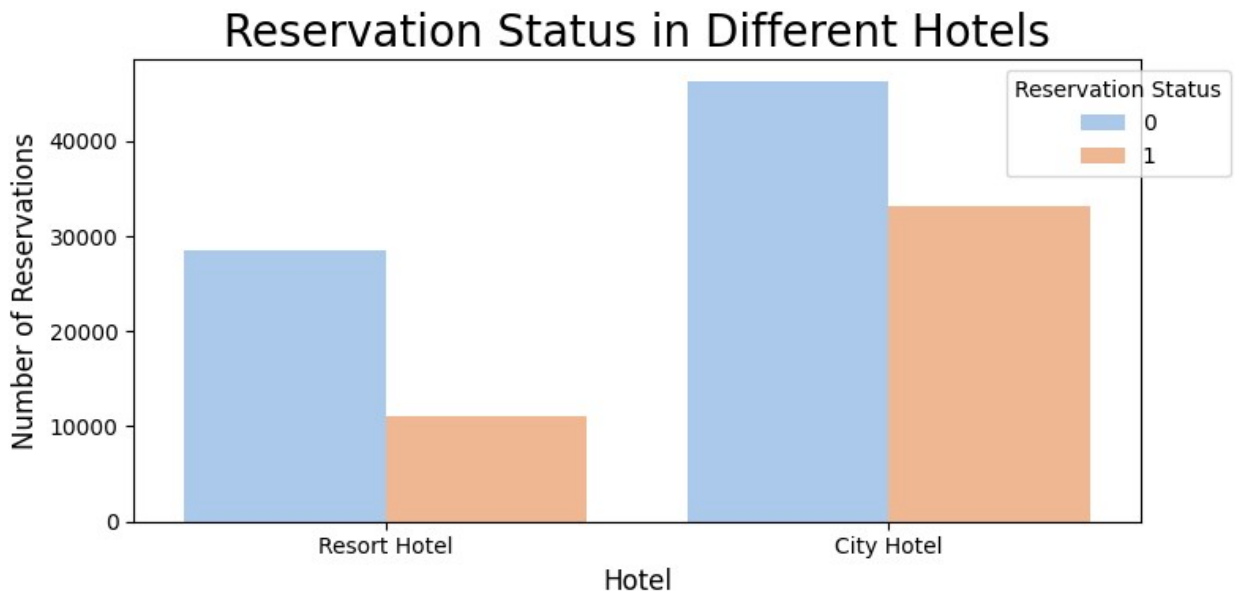
```
is_canceled
0    74745
1    44152
Name: count, dtype: int64
```

```
Cancelled_count= data['is_canceled'].value_counts(normalize=True)
print(Cancelled_count)
```

```
is_canceled
0    0.628653
1    0.371347
Name: proportion, dtype: float64
```

```
plt.figure(figsize=(5,4))
plt.title("Reservation_Status_Count")
plt.bar(['Not
Cancelled','Cancelled'],data['is_canceled'].value_counts(),edgecolor='
k' ,width=0.5, color=['Green','Red'])
plt.show()
```

```
import matplotlib.pyplot as plt
import seaborn as sns

plt.figure(figsize=(8, 4))

# Creating the count plot
ax1 = sns.countplot(
    x="hotel",
    hue="is_canceled",
    data=data,
    palette="pastel"
)

# Adjusting the legend
legend_labels, _ = ax1.get_legend_handles_labels()
ax1.legend(bbox_to_anchor=(1.1, 1), title="Reservation Status")  #
Fixed legend positioning


plt.title("Reservation Status in Different Hotels", size=20)
plt.xlabel("Hotel", size=12)
plt.ylabel("Number of Reservations", size=12)

plt.tight_layout()
plt.show()
```




```
Resort_hotel= data[data['hotel']== 'Resort Hotel']
Resort_hotel['is_canceled'].value_counts(normalize=True)

is_canceled
0    0.72025
```

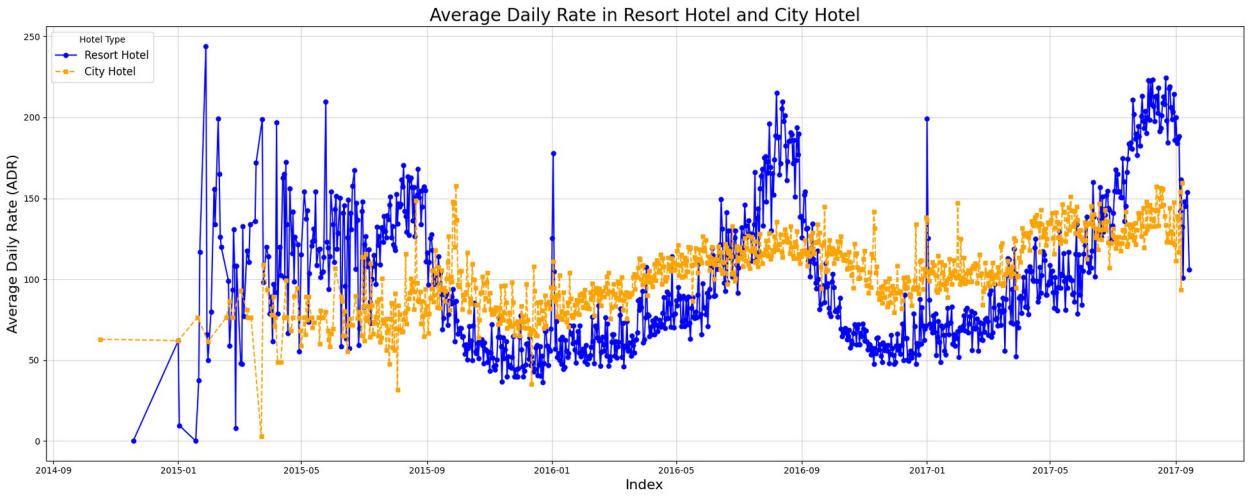
```
1    0.27975
Name: proportion, dtype: float64
```

```
city_hotel=data[data['hotel']=='City Hotel']
city_hotel['is_canceled'].value_counts(normalize=True)
```

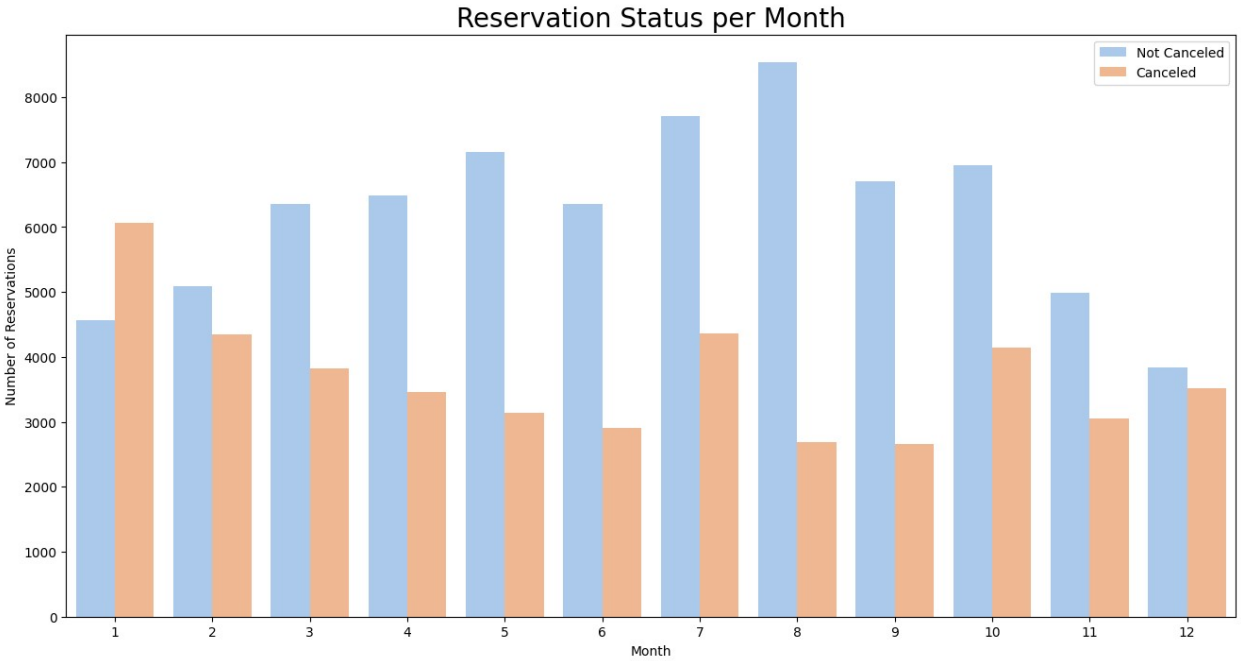
```
is_canceled
0    0.582918
1    0.417082
Name: proportion, dtype: float64
```

```
Resort_hotel=Resort_hotel.groupby('reservation_status_date')
[['adr']].mean()
city_hotel=city_hotel.groupby('reservation_status_date')
[['adr']].mean()
```

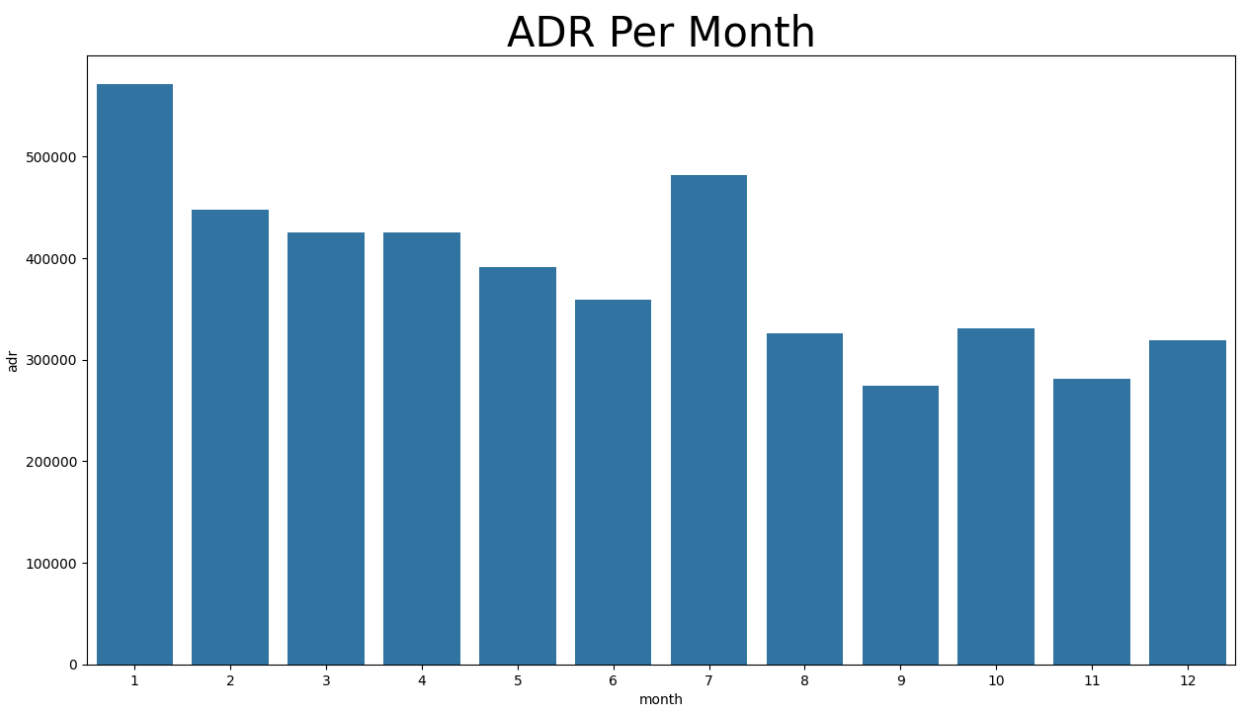
```
plt.figure(figsize=(20, 8))
plt.title("Average Daily Rate in Resort Hotel and City Hotel",
size=20)

plt.plot(
    Resort_hotel.index,
    Resort_hotel['adr'],
    label='Resort Hotel',
    color='blue',
    linestyle='-',
    marker='o',
    markersize=5
)
plt.plot(
    city_hotel.index,
    city_hotel['adr'],
    label='City Hotel',
    color='orange',
    linestyle='--',
    marker='s',
    markersize=5
)
plt.xlabel("Index", size=16)
plt.ylabel("Average Daily Rate (ADR)", size=16)
plt.legend(title="Hotel Type", loc="best", fontsize=12)
plt.grid(alpha=0.5)
plt.tight_layout()
plt.show()
```



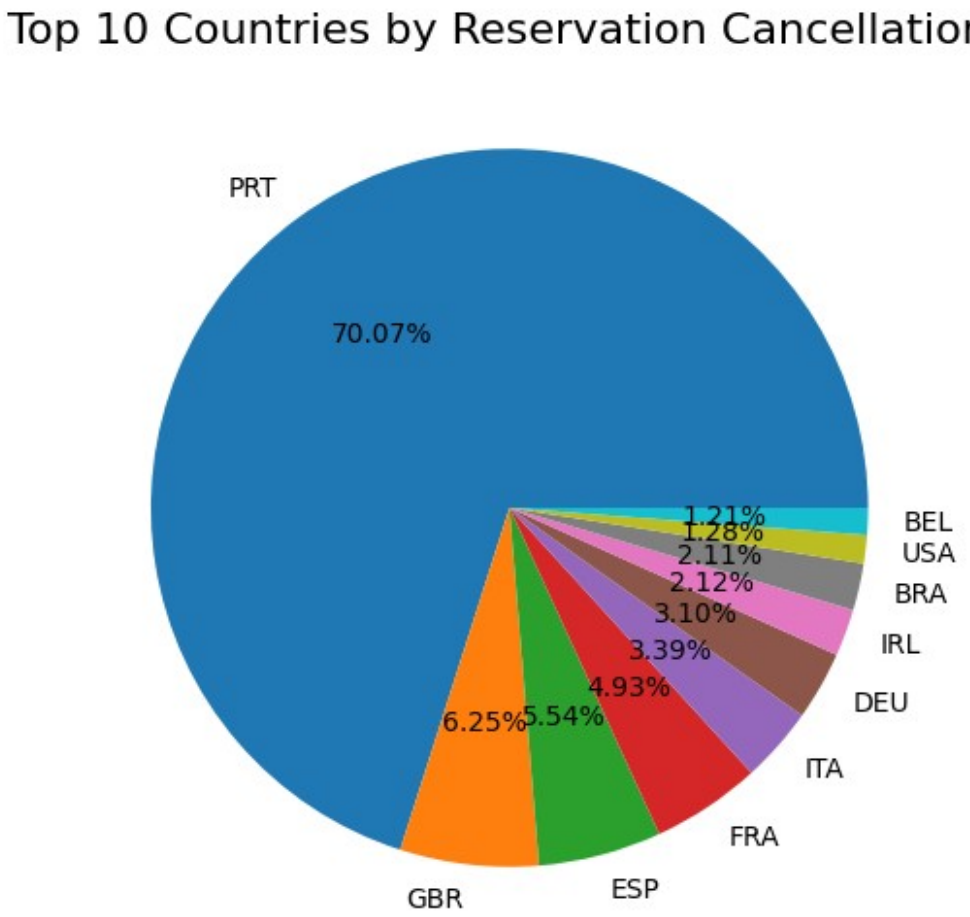

```
data['month'] = data['reservation_status_date'].dt.month
plt.figure(figsize=(16, 8))

ax1 = sns.countplot(
    x="month",
    hue="is_canceled",
    data=data,
    palette="pastel"
)

ax1.legend(labels=['Not Canceled', 'Canceled'], bbox_to_anchor=(1, 1))
plt.title("Reservation Status per Month", size=20)
plt.xlabel("Month")
plt.ylabel("Number of Reservations")
plt.show()
```




```
plt.figure(figsize=(15, 8))
plt.title('ADR Per Month', size=30)
sns.barplot(
    x='month',
    y='adr',
    data=data[data['is_canceled'] == 1].groupby('month')
[['adr']].sum().reset_index()
)
plt.show()
```




```
cancelled_data = data[data['is_canceled'] == 1]
top_10_country = cancelled_data['country'].value_counts()[:10]

plt.figure(figsize=(6, 6))
plt.title("Top 10 Countries by Reservation Cancellations", size=16)
plt.pie(top_10_country, autopct='%.2f%%', labels=top_10_country.index)
plt.show()
```




```
data['market_segment'].value_counts()

market_segment
Online TA        56402
Offline TA/TO    24159
Groups           19806
Direct           12448
Corporate         5111
Complementary      734
Aviation           237
Name: count, dtype: int64

data['market_segment'].value_counts(normalize=True)

market_segment
Online TA        0.474377
Offline TA/TO    0.203193
Groups           0.166581
Direct           0.104696
Corporate        0.042987
Complementary    0.006173
```

```
Aviation         0.001993
Name: proportion, dtype: float64
```

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

```
market_segment
Online TA        0.469696
Groups           0.273985
Offline TA/TO    0.187466
Direct           0.043486
Corporate        0.022151
Complementary    0.002038
Aviation         0.001178
Name: proportion, dtype: float64
```

```
not_cancelled_data=data[data['is_canceled']==0]
print(not_cancelled_data)
```

```
                hotel  is_canceled  lead_time  arrival_date_year  \
0        Resort Hotel            0        342               2015
1        Resort Hotel            0        737               2015
2        Resort Hotel            0          7               2015
3        Resort Hotel            0         13               2015
4        Resort Hotel            0         14               2015
...               ...          ...        ...                ...
119385     City Hotel            0         23               2017
119386     City Hotel            0        102               2017
119387     City Hotel            0         34               2017
119388     City Hotel            0        109               2017
119389     City Hotel            0        205               2017

       arrival_date_month  arrival_date_week_number  \
0                    July                        27
1                    July                        27
2                    July                        27
3                    July                        27
4                    July                        27
...                   ...                       ...
119385             August                        35
119386             August                        35
119387             August                        35
119388             August                        35
119389             August                        35

        arrival_date_day_of_month  stays_in_weekend_nights  \
0                               1                       0
1                               1                       0
2                               1                       0
3                               1                       0
4                               1                       0
```

```
...                              ...                         ...
119385                            30                          2
119386                            31                          2
119387                            31                          2
119388                            31                          2
119389                            29                          2

        stays_in_week_nights  adults  ...  booking_changes
deposit_type  \
0                          0       2  ...                3    No
Deposit
1                          0       2  ...                4    No
Deposit
2                          1       1  ...                0    No
Deposit
3                          1       1  ...                0    No
Deposit
4                          2       2  ...                0    No
Deposit
...                      ...     ...  ...              ...           .
..
119385                     5       2  ...                0    No
Deposit
119386                     5       3  ...                0    No
Deposit
119387                     5       2  ...                0    No
Deposit
119388                     5       2  ...                0    No
Deposit
119389                     7       2  ...                0    No
Deposit

       days_in_waiting_list customer_type     adr
required_car_parking_spaces  \
0                          0     Transient    0.00
0
1                          0     Transient    0.00
0
2                          0     Transient   75.00
0
3                          0     Transient   75.00
0
4                          0     Transient   98.00
0
...                      ...           ...     ...
...
119385                     0     Transient   96.14
0
119386                     0     Transient  225.43
```

```
0
119387                      0     Transient  157.71
0
119388                      0     Transient  104.40
0
119389                      0     Transient  151.20
0

        total_of_special_requests  reservation_status  \
0                               0           Check-Out
1                               0           Check-Out
2                               0           Check-Out
3                               0           Check-Out
4                               1           Check-Out
...                           ...                 ...
119385                          0           Check-Out
119386                          2           Check-Out
119387                          4           Check-Out
119388                          0           Check-Out
119389                          2           Check-Out

        reservation_status_date month
0                    2015-07-01     7
1                    2015-07-01     7
2                    2015-07-02     7
3                    2015-07-02     7
4                    2015-07-03     7
...                         ...   ...
119385               2017-09-06     9
119386               2017-09-07     9
119387               2017-09-07     9
119388               2017-09-07     9
119389               2017-09-07     9

[74745 rows x 31 columns]
```

```
not_cancelled_data['is_canceled'].value_counts()
```

```
is_canceled
0    74745
Name: count, dtype: int64
```

```
cancelled_data_adr=cancelled_data.groupby('reservation_status_date')
[['adr']].mean()
cancelled_data_adr.reset_index(inplace=True)
cancelled_data_adr.sort_values('reservation_status_date',inplace=True)

not_cancelled_data_adr=not_cancelled_data.groupby('reservation_status_
date')[['adr']].mean()
not_cancelled_data_adr.reset_index(inplace=True)
```

```
not_cancelled_data_adr.sort_values('reservation_status_date',inplace=T
rue)

plt.figure(figsize=(25,8))
plt.title('Average Daily Rate',fontsize=35)
plt.plot(not_cancelled_data_adr['reservation_status_date'],not_cancell
ed_data_adr['adr'], label='not_cancelled',
color='blue',marker='o',linestyle='-')
plt.plot(cancelled_data_adr['reservation_status_date'],cancelled_data_
adr['adr'], label='cancelled',color='red',marker='^',linestyle='--')
plt.legend()
plt.xlabel('Reservation Status Date')
plt.ylabel('Average Daily Rate (ADR)')
plt.show()
```