

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

```
df = pd.read_csv("Dataset .csv")
df
```

	Restaurant ID	Restaurant Name	Country Code
City \			
0	6317637	Le Petit Souffle	162
Makati City			
1	6304287	Izakaya Kikufuji	162
Makati City			
2	6300002	Heat - Edsa Shangri-La	162
Mandaluyong City			
3	6318506	Ooma	162
Mandaluyong City			
4	6314302	Sambo Kojin	162
Mandaluyong City			
...

9546	5915730	Naml \ Gurme	208
00istanbul			
9547	5908749	Ceviz A00ac \	208
00istanbul			
9548	5915807	Huqqa	208
00istanbul			
9549	5916112	A000k Kahve	208
00istanbul			
9550	5927402	Walter's Coffee Roastery	208
00istanbul			

	Address \
0	Third Floor, Century City Mall, Kalayaan Avenu...
1	Little Tokyo, 2277 Chino Roces Avenue, Legaspi...
2	Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...
3	Third Floor, Mega Fashion Hall, SM Megamall, O...
4	Third Floor, Mega Atrium, SM Megamall, Ortigas...
...	...
9546	Kemanke00 Karamustafa Pa00a Mahallesi, R\ht\m ...
9547	Ko00uyolu Mahallesi, Muhittin 00st0_nda00 Cadd...
9548	Kuru0_e00me Mahallesi, Muallim Naci Caddesi, N...
9549	Kuru0_e00me Mahallesi, Muallim Naci Caddesi, N...
9550	Cafea00a Mahallesi, Bademalt\ Sokak, No 21/B, ...

	Locality \
0	Century City Mall, Poblacion, Makati City
1	Little Tokyo, Legaspi Village, Makati City
2	Edsa Shangri-La, Ortigas, Mandaluyong City
3	SM Megamall, Ortigas, Mandaluyong City

4	SM Megamall, Ortigas, Mandaluyong City		
...	...		
9546	Karaköy		
9547	Koşuyolu		
9548	Kuruçeşme		
9549	Kuruçeşme		
9550	Moda		
	Locality Verbose	Longitude	\
0	Century City Mall, Poblacion, Makati City, Mak...	121.027535	
1	Little Tokyo, Legaspi Village, Makati City, Ma...	121.014101	
2	Edsa Shangri-La, Ortigas, Mandaluyong City, Ma...	121.056831	
3	SM Megamall, Ortigas, Mandaluyong City, Mandal...	121.056475	
4	SM Megamall, Ortigas, Mandaluyong City, Mandal...	121.057508	
...	...		
9546	Karaköy, İstanbul	28.977392	
9547	Koşuyolu, İstanbul	29.041297	
9548	Kuruçeşme, İstanbul	29.034640	
9549	Kuruçeşme, İstanbul	29.036019	
9550	Moda, İstanbul	29.026016	
	Latitude	Cuisines	...
Currency	\		
0	14.565443	French, Japanese, Desserts	... Botswana
Pula(P)			
1	14.553708	Japanese	... Botswana
Pula(P)			
2	14.581404	Seafood, Asian, Filipino, Indian	... Botswana
Pula(P)			
3	14.585318	Japanese, Sushi	... Botswana
Pula(P)			
4	14.584450	Japanese, Korean	... Botswana
Pula(P)			
...
...			
9546	41.022793	Turkish	... Turkish
Lira(TL)			
9547	41.009847	World Cuisine, Patisserie, Cafe	... Turkish
Lira(TL)			
9548	41.055817	Italian, World Cuisine	... Turkish
Lira(TL)			
9549	41.057979	Restaurant Cafe	... Turkish
Lira(TL)			
9550	40.984776	Cafe	... Turkish
Lira(TL)			
	Has Table booking	Has Online delivery	Is delivering now \
0	Yes	No	No
1	Yes	No	No
2	Yes	No	No

3	No	No	No
4	Yes	No	No
...
9546	No	No	No
9547	No	No	No
9548	No	No	No
9549	No	No	No
9550	No	No	No

	Switch to order menu	Price range	Aggregate rating	Rating color
\				
0	No	3	4.8	Dark Green
1	No	3	4.5	Dark Green
2	No	4	4.4	Green
3	No	4	4.9	Dark Green
4	No	4	4.8	Dark Green
...
9546	No	3	4.1	Green
9547	No	3	4.2	Green
9548	No	4	3.7	Yellow
9549	No	4	4.0	Green
9550	No	2	4.0	Green

	Rating text	Votes
0	Excellent	314
1	Excellent	591
2	Very Good	270
3	Excellent	365
4	Excellent	229
...
9546	Very Good	788
9547	Very Good	1034
9548	Good	661
9549	Very Good	901
9550	Very Good	591

[9551 rows x 21 columns]

df.info()

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9551 entries, 0 to 9550
Data columns (total 21 columns):
#   Column                                Non-Null Count  Dtype
---  -
0   Restaurant ID                        9551 non-null   int64
1   Restaurant Name                      9551 non-null   object
2   Country Code                        9551 non-null   int64
3   City                                9551 non-null   object
4   Address                             9551 non-null   object
5   Locality                            9551 non-null   object
6   Locality Verbose                    9551 non-null   object
7   Longitude                           9551 non-null   float64
8   Latitude                            9551 non-null   float64
9   Cuisines                            9542 non-null   object
10  Average Cost for two                 9551 non-null   int64
11  Currency                            9551 non-null   object
12  Has Table booking                   9551 non-null   object
13  Has Online delivery                 9551 non-null   object
14  Is delivering now                   9551 non-null   object
15  Switch to order menu                9551 non-null   object
16  Price range                         9551 non-null   int64
17  Aggregate rating                    9551 non-null   float64
18  Rating color                        9551 non-null   object
19  Rating text                         9551 non-null   object
20  Votes                              9551 non-null   int64
dtypes: float64(3), int64(5), object(13)
memory usage: 1.5+ MB

```

```

# Display the number of rows and columns
df.shape

```

```

(9551, 21)

```

```

#Check for missing values in each column
missing_values = df.isnull().sum()
missing_values

```

```

Restaurant ID      0
Restaurant Name    0
Country Code       0
City               0
Address            0
Locality           0
Locality Verbose   0
Longitude          0
Latitude           0
Cuisines           9
Average Cost for two 0
Currency           0

```

```

Has Table booking      0
Has Online delivery    0
Is delivering now      0
Switch to order menu   0
Price range            0
Aggregate rating       0
Rating color           0
Rating text            0
Votes                 0
dtype: int64

#Drop rows with missing values
df.dropna(inplace=True)

#After handling missing values
df.shape

(9542, 21)

```

Task 1: Table Booking and Online Delivery

```

# Determine the percentage of restaurants that offer table booking
table_booking_percentage = (df['Has Table
booking'].value_counts(normalize=True) * 100).round(2)

table_booking_percentage

No      87.86
Yes     12.14
Name: Has Table booking, dtype: float64

# Determine the percentage of restaurants that offer online delivery
online_delivery_percentage = (df['Has Online
delivery'].value_counts(normalize=True) * 100).round(2)
online_delivery_percentage

No      74.31
Yes     25.69
Name: Has Online delivery, dtype: float64

# Convert 'Aggregate rating' column to numeric (if not already)
df['Aggregate rating'] = pd.to_numeric(df['Aggregate rating'],
errors='coerce')

# Group the data based on 'Has Table booking' and calculate the
average ratings
average_ratings = df.groupby('Has Table booking')['Aggregate
rating'].mean()

average_ratings

```

```

Has Table booking
No      2.557956
Yes     3.441969
Name: Aggregate rating, dtype: float64

# Calculate the total number of restaurants for each price range
total_restaurants_per_price_range = df['Price range'].value_counts()

# Calculate the number of restaurants offering online delivery for
each price range
online_delivery_per_price_range = df[df['Has Online delivery'] ==
'Yes']['Price range'].value_counts()

# Calculate the percentage of restaurants offering online delivery for
each price range
online_delivery_percentage_per_price_range =
(online_delivery_per_price_range / total_restaurants_per_price_range)
* 100

online_delivery_percentage_per_price_range
1      15.795403
2      41.310633
3      29.252669
4       9.044369
Name: Price range, dtype: float64

```

Task 2: Price Range Analysis

```

# Determine the most common price range among all the restaurants
most_common_price_range = df['Price range'].value_counts().idxmax()
most_common_price_range
1

# Convert 'Aggregate rating' column to numeric (if not already)
df['Aggregate rating'] = pd.to_numeric(df['Aggregate rating'],
errors='coerce')

# Calculate the average rating for each price range
average_rating_per_price_range = df.groupby('Price range')['Aggregate
rating'].mean().round(2)

average_rating_per_price_range
Price range
1      2.00
2      2.94
3      3.68

```

```

4      3.82
Name: Aggregate rating, dtype: float64

# Calculate the average rating for each price range
average_rating_per_price_range = df.groupby('Price range')['Aggregate
rating'].mean()

# Find the price range with the highest average rating
highest_avg_rating_price_range =
average_rating_per_price_range.idxmax()

# Assuming that the color is represented by the 'Rating color' column
color_for_highest_avg_rating = df[df['Price range'] ==
highest_avg_rating_price_range]['Rating color'].iloc[0]

color_for_highest_avg_rating

'Green'

```

Task 3: Feature Engineering

```

# Extract additional features: length of restaurant name and address
df['Restaurant Name Length'] = df['Restaurant Name'].str.len()
df['Address Length'] = df['Address'].str.len()

df[['Restaurant Name', 'Restaurant Name Length']]

```

	Restaurant Name	Restaurant Name Length
0	Le Petit Souffle	16
1	Izakaya Kikufuji	16
2	Heat - Edsa Shangri-La	22
3	Ooma	4
4	Sambo Kojin	11
...
9546	Naml \ Gurme	11
9547	Ceviz A00ac \	12
9548	Huqqa	5
9549	A000k Kahve	11
9550	Walter's Coffee Roastery	24

```

[9542 rows x 2 columns]

df[['Address', 'Address Length']]

```

	Address	Address Length
0	Third Floor, Century City Mall, Kalayaan Avenu...	71

```

1      Little Tokyo, 2277 Chino Roces Avenue, Legaspi...
67
2      Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...
56
3      Third Floor, Mega Fashion Hall, SM Megamall, O...
70
4      Third Floor, Mega Atrium, SM Megamall, Ortigas...
64
...
.
9546  Kemanke000 Karamustafa Pa000a Mahallesi, R\ht\m ...
103
9547  Ko000uyolu Mahallesi, Muhittin 000st0_nda000 Cadd...
77
9548  Kuru0_e000me Mahallesi, Muallim Naci Caddesi, N...
73
9549  Kuru0_e000me Mahallesi, Muallim Naci Caddesi, N...
75
9550  Cafea000a Mahallesi, Bademalt\ Sokak, No 21/B, ...
65

```

```
[9542 rows x 2 columns]
```

```

# Perform one-hot encoding for 'Has Table booking' and 'Has Online
delivery' columns
df_encoded = pd.get_dummies(df, columns=['Has Table booking', 'Has
Online delivery'])

```

```
df_encoded.head()
```

	Restaurant ID	Restaurant Name	Country	Code
City \				
0	6317637	Le Petit Souffle	162	Makati
City				
1	6304287	Izakaya Kikufuji	162	Makati
City				
2	6300002	Heat - Edsa Shangri-La	162	Mandaluyong
City				
3	6318506	Ooma	162	Mandaluyong
City				
4	6314302	Sambo Kojin	162	Mandaluyong
City				

	Address \
0	Third Floor, Century City Mall, Kalayaan Avenu...
1	Little Tokyo, 2277 Chino Roces Avenue, Legaspi...
2	Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...
3	Third Floor, Mega Fashion Hall, SM Megamall, O...
4	Third Floor, Mega Atrium, SM Megamall, Ortigas...

	Locality \
0	Century City Mall, Poblacion, Makati City
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2	Edsa Shangri-La, Ortigas, Mandaluyong City
3	SM Megamall, Ortigas, Mandaluyong City
4	SM Megamall, Ortigas, Mandaluyong City

	Locality Verbose	Longitude
Latitude \		
0	Century City Mall, Poblacion, Makati City, Mak...	121.027535
	14.565443	
1	Little Tokyo, Legaspi Village, Makati City, Ma...	121.014101
	14.553708	
2	Edsa Shangri-La, Ortigas, Mandaluyong City, Ma...	121.056831
	14.581404	
3	SM Megamall, Ortigas, Mandaluyong City, Mandal...	121.056475
	14.585318	
4	SM Megamall, Ortigas, Mandaluyong City, Mandal...	121.057508
	14.584450	

	Cuisines ...	Aggregate rating	Rating
color \			
0	French, Japanese, Desserts ...	4.8	Dark
	Green		
1	Japanese ...	4.5	Dark
	Green		
2	Seafood, Asian, Filipino, Indian ...	4.4	
	Green		
3	Japanese, Sushi ...	4.9	Dark
	Green		
4	Japanese, Korean ...	4.8	Dark
	Green		

	Rating text	Votes	Restaurant Name Length	Address Length	\
0	Excellent	314	16	71	
1	Excellent	591	16	67	
2	Very Good	270	22	56	
3	Excellent	365	4	70	
4	Excellent	229	11	64	

	Has Table booking_No	Has Table booking_Yes	Has Online delivery_No	\
0	0	1	1	
1	0	1	1	
2	0	1	1	
3	1	0	1	

4	0	1	1
---	---	---	---

Has Online delivery_Yes

0	0
1	0
2	0
3	0
4	0

[5 rows x 25 columns]