ZOMATO RESTAURANT SUCCESS FACTORS ANALYSIS

In [1]:
```
## Importing the libraries.
```

In [12]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
import plotly.express as px
import warnings
warnings.filterwarnings('ignore')
from collections import Counter
```

In [2]:
```
## Importing the file.
```

In [13]:
```
df=pd.read_csv('C:/Users/Mayank Parashari/Downloads/Indian-Resturants.csv')
```

In [3]:
```
## Getting the view of the data.¶
```

In [14]:
```
df.head(5)
```

Out[14]:

	res_id	name	establishment	url	address	city
0	3400299	Bikanervala	['Quick Bites']	https://www.zomato.com/agra/bikanervala-khanda...	Kalyani Point, Near Tulsi Cinema, Bypass Road,...	Agra
1	3400005	Mama Chicken Mama Franky House	['Quick Bites']	https://www.zomato.com/agra/mama-chicken-mama-...	Main Market, Sadar Bazaar, Agra Cantt, Agra	Agra
2	3401013	Bhagat Halwai	['Quick Bites']	https://www.zomato.com/agra/bhagat-halwai-2-sh...	62/1, Near Easy Day, West Shivaji Nagar, Goalp...	Agra
3	3400290	Bhagat Halwai	['Quick Bites']	https://www.zomato.com/agra/bhagat-halwai-civi...	Near Anjana Cinema, Nehru Nagar, Civil Lines, ...	Agra
4	3401744	The Salt Cafe Kitchen & Bar	['Casual Dining']	https://www.zomato.com/agra/the-salt-cafe-kitc...	1C,3rd Floor, Fatehabad Road, Tajganj, Agra	Agra

5 rows × 26 columns

In [4]:
```
## For analyzing the data types of the different coluumns.¶
```

In [15]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 211944 entries, 0 to 211943
Data columns (total 26 columns):
 #   Column                Non-Null Count   Dtype  
---  ------                --------------   -----  
 0   res_id                211944 non-null  int64  
 1   name                  211944 non-null  object 
 2   establishment         211944 non-null  object 
 3   url                   211944 non-null  object 
 4   address               211810 non-null  object 
 5   city                  211944 non-null  object 
 6   city_id               211944 non-null  int64  
 7   locality              211944 non-null  object 
 8   latitude              211944 non-null  float64
 9   longitude             211944 non-null  float64
 10  zipcode               48757 non-null   object 
 11  country_id            211944 non-null  int64  
 12  locality_verbose      211944 non-null  object 
 13  cuisines              210553 non-null  object 
 14  timings               208070 non-null  object 
 15  average_cost_for_two  211944 non-null  int64  
 16  price_range           211944 non-null  int64  
 17  currency              211944 non-null  object 
 18  highlights            211944 non-null  object 
 19  aggregate_rating      211944 non-null  float64
 20  rating_text           211944 non-null  object 
 21  votes                 211944 non-null  int64  
 22  photo_count           211944 non-null  int64  
 23  opentable_support     211896 non-null  float64
 24  delivery              211944 non-null  int64  
 25  takeaway              211944 non-null  int64  
dtypes: float64(4), int64(9), object(13)
memory usage: 42.0+ MB
```

In [5]:
```
## Describing the 5 point summary of the data.
```

In [16]:
```
df.describe()
```

Out[16]:

	res_id	city_id	latitude	longitude	country_id
count	2.119440e+05	211944.000000	211944.000000	211944.000000	211944.0
mean	1.349411e+07	4746.785434	21.499758	77.615276	1.0
std	7.883722e+06	5568.766386	22.781331	7.500104	0.0
min	5.000000e+01	1.000000	0.000000	0.000000	1.0
25%	3.301027e+06	11.000000	15.496071	74.877961	1.0
50%	1.869573e+07	34.000000	22.514494	77.425971	1.0
75%	1.881297e+07	11306.000000	26.841667	80.219323	1.0
max	1.915979e+07	11354.000000	10000.000000	91.832769	1.0

In [6]:
```python
## Describing summary statistics for all columns
```

In [18]:
```python
df.describe(include='object')
```

Out[18]:

	name	establishment	url	address	city	local
count	211944	211944	211944	211810	211944	2119
unique	41100	27	55568	50657	99	37
top	Domino's Pizza	['Quick Bites']	https://www.zomato.com/chennai/3bs-buddies-bar...	Laxman Jhula, Tapovan, Rishikesh	Chennai	C Lin
freq	3108	64390	169	299	11630	36

In [7]:
```python
## Dexcribing the shape of the dataset.
```

In [19]:
```python
df.shape
```

Out[19]:
```
(211944, 26)
```

In [8]:
```python
## Value count of the data.
```

In [20]:
```python
df['res_id'].value_counts()[df['res_id'].value_counts() > 1]
```

Out[20]:
```
res_id
18631911    169
68976       161
18598737    156
72245       154
18921640    154
           ...
3100179       2
2700801       2
19116862      2
2701455       2
310816        2
Name: count, Length: 30304, dtype: int64
```

In [9]:
```python
## Dropping the duplicate value from the data.
```

In [21]:
```python
df = df.drop_duplicates(subset='res_id')
```

In [22]:
```python
duplicates = df.duplicated().sum()
print("\nTotal Duplicate Rows:", duplicates)
```

```
Total Duplicate Rows: 0
```

In [23]:
```python
df.shape
```

```
Out[23]: (55568, 26)
```

```
In [24]: df.isnull().sum()
```

```
Out[24]: res_id                      0
         name                        0
         establishment               0
         url                         0
         address                    18
         city                        0
         city_id                     0
         locality                    0
         latitude                    0
         longitude                   0
         zipcode                 44623
         country_id                  0
         locality_verbose            0
         cuisines                  470
         timings                  1003
         average_cost_for_two        0
         price_range                 0
         currency                    0
         highlights                  0
         aggregate_rating            0
         rating_text                 0
         votes                       0
         photo_count                 0
         opentable_support          12
         delivery                    0
         takeaway                    0
         dtype: int64
```

```
In [25]: ## Replacing the missing values of the zipcode with most common zipcode in a p
         df['zipcode'] = df.groupby('city')['zipcode'].transform(
                             lambda x: x.fillna(x.mode()[0] if not x.mode().empty else
                         )
```

```
In [26]: ## Checking for unique values in different columns.
         for col in ['city','locality','establishment','rating_text']:
             print(col, df[col].nunique())
             print(df[col].value_counts().head(), '\n')
```

```
city 99
city
Bangalore    2247
Mumbai       2022
Pune         1843
Chennai      1827
New Delhi    1704
Name: count, dtype: int64

locality 3731
locality
Civil Lines      752
Model Town       447
Shastri Nagar    392
Vijay Nagar      380
Gomti Nagar      274
Name: count, dtype: int64

establishment 27
establishment
['Quick Bites']        14032
['Casual Dining']      12270
['Café']                4123
['Bakery']              3741
['Dessert Parlour']     3675
Name: count, dtype: int64

rating_text 33
rating_text
Average      16313
Good         16019
Very Good    10905
Not rated    10058
Excellent     1609
Name: count, dtype: int64
```

In [27]:
```
## Managing the missing time values.
df['timings'] = df.groupby('locality')['timings'].transform(
    lambda x: x.fillna(x.mode()[0] if not x.mode().empty else x)
)
```

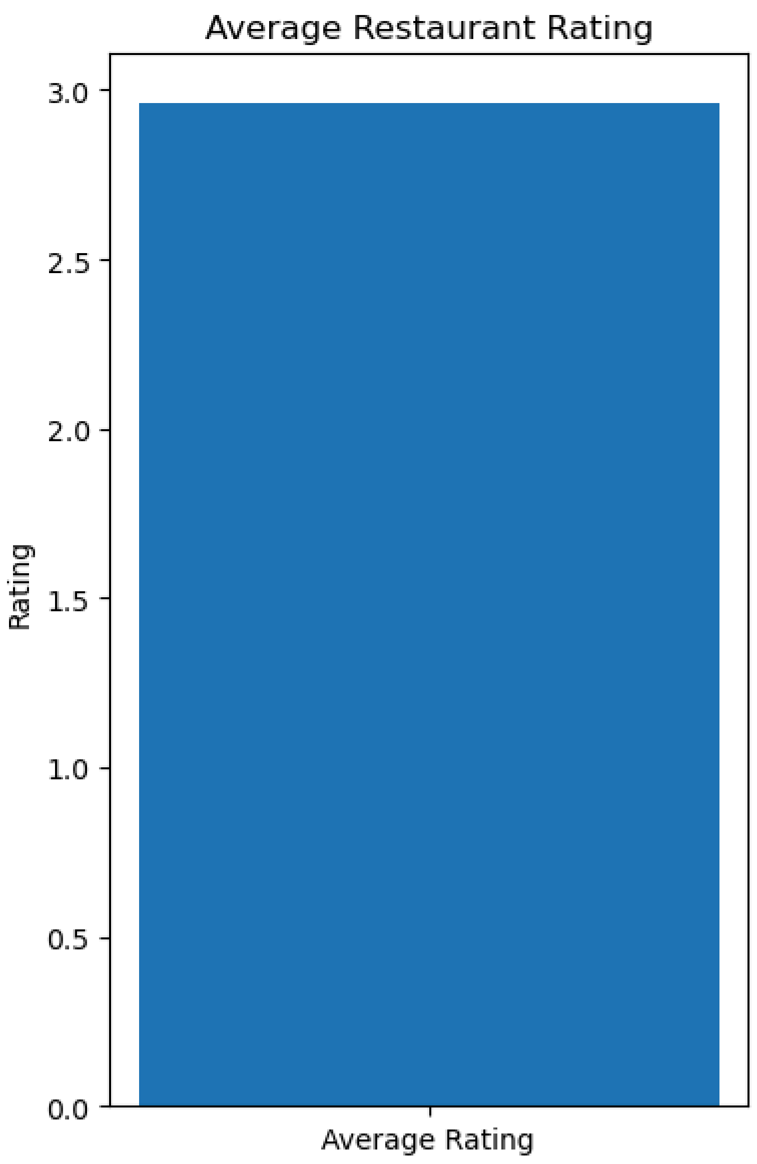
In [28]:
```
df.isnull().sum()
```

Out[28]:
```
res_id                    0
name                      0
establishment             0
url                       0
address                  18
city                      0
city_id                   0
locality                  0
latitude                  0
longitude                 0
zipcode                 395
country_id                0
locality_verbose          0
cuisines                470
timings                   5
average_cost_for_two      0
price_range               0
currency                  0
highlights                0
aggregate_rating          0
rating_text               0
votes                     0
photo_count               0
opentable_support        12
delivery                  0
takeaway                  0
dtype: int64
```

In [29]:
```
## Average rating of the restaurants.
avg_rating = df['aggregate_rating'].mean()
print("Average Rating:", avg_rating)
```

```
Average Rating: 2.958593075151166
```

In [30]:
```
plt.figure(figsize=(4,6))
plt.bar(['Average Rating'], [avg_rating])
plt.ylabel('Rating')
plt.title('Average Restaurant Rating')
plt.tight_layout()
plt.show()
```

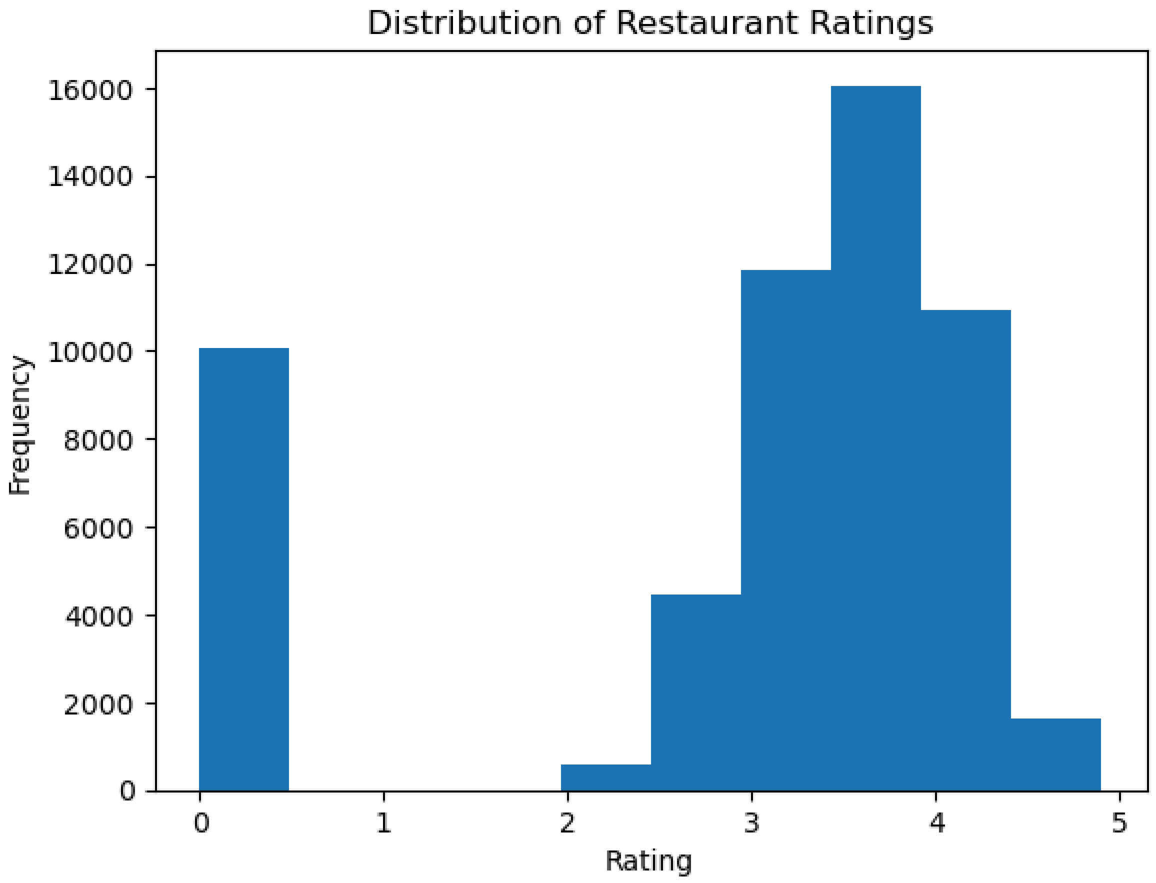


```
In [ ]:
```

```
In [31]: print(df['aggregate_rating'].describe())
```

```
count    55568.000000
mean         2.958593
std          1.464576
min          0.000000
25%          2.900000
50%          3.500000
75%          3.900000
max          4.900000
Name: aggregate_rating, dtype: float64
```

```
In [32]: plt.hist(df['aggregate_rating'].dropna(), bins=10)
         plt.xlabel("Rating")
         plt.ylabel("Frequency")
         plt.title("Distribution of Restaurant Ratings")
plt.show()
```



Insights: Most common rating of the restaurents is between 3 and 4.

In [33]:
```
city_counts = df['city'].value_counts()
```

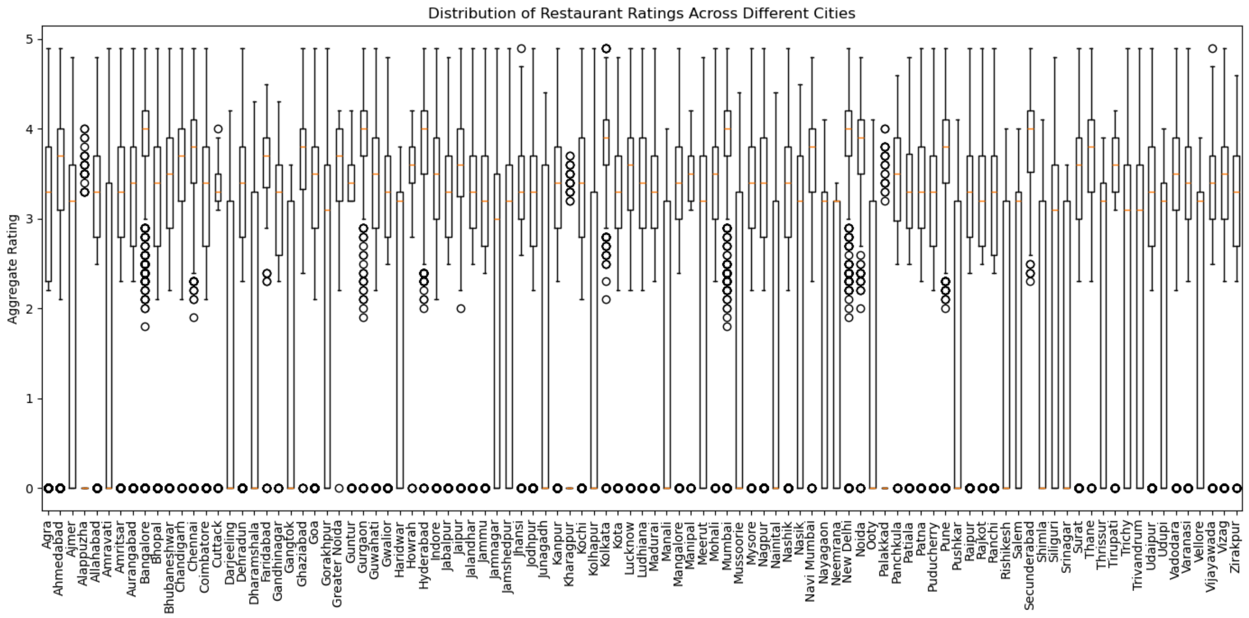
In [34]:
```
city_counts.head(5)
```

Out[34]:
```
city
Bangalore    2247
Mumbai       2022
Pune         1843
Chennai      1827
New Delhi    1704
Name: count, dtype: int64
```

In [35]:
```
df_clean = df.dropna(subset=['aggregate_rating', 'city'])
```

In [36]:
```
grouped = df_clean.groupby('city')['aggregate_rating']
data = [grouped.get_group(city) for city in grouped.groups.keys()]
labels = list(grouped.groups.keys())
```

In [37]:
```
plt.figure(figsize=(14, 7))
plt.boxplot(data, labels=labels)
plt.xticks(rotation=90)
plt.ylabel("Aggregate Rating")
plt.title("Distribution of Restaurant Ratings Across Different Cities")
plt.tight_layout()
plt.show()
```

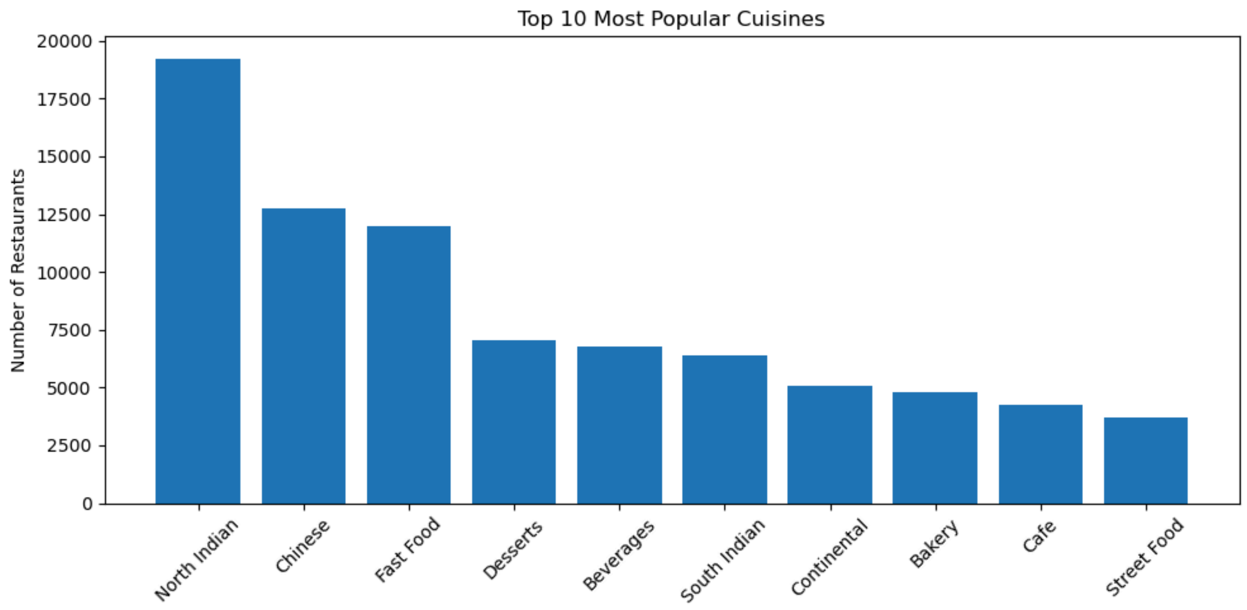


In [38]:

```
# Ensure the cuisines column exists
df = df.dropna(subset=['cuisines'])

# Split cuisines (many restaurants list multiple cuisines separated by commas)
cuisine_series = df['cuisines'].str.split(', ')

# Flatten list of cuisines into a single series
all_cuisines = cuisine_series.explode()

# Count frequency of each cuisine
cuisine_counts = all_cuisines.value_counts()

# Display top cuisines
print("Top 20 Most Popular Cuisines:")
print(cuisine_counts.head(20))
```

```
Top 20 Most Popular Cuisines:
cuisines
North Indian    19226
Chinese         12724
Fast Food       11988
Desserts         7064
Beverages        6754
South Indian     6381
Continental      5076
Bakery           4813
Cafe             4252
Street Food      3715
Italian          3673
Biryani          3207
Mithai           3144
Ice Cream        3053
Pizza            2461
Mughlai          2034
Burger           1852
Sandwich         1524
Finger Food      1336
Juices           1143
Name: count, dtype: int64
```

In [39]:
```python
top10_cuisines = cuisine_counts.head(10)

plt.figure(figsize=(10, 5))
plt.bar(top10_cuisines.index, top10_cuisines.values)
plt.xticks(rotation=45)
plt.ylabel("Number of Restaurants")
plt.title("Top 10 Most Popular Cuisines")
plt.tight_layout()
plt.show()
```



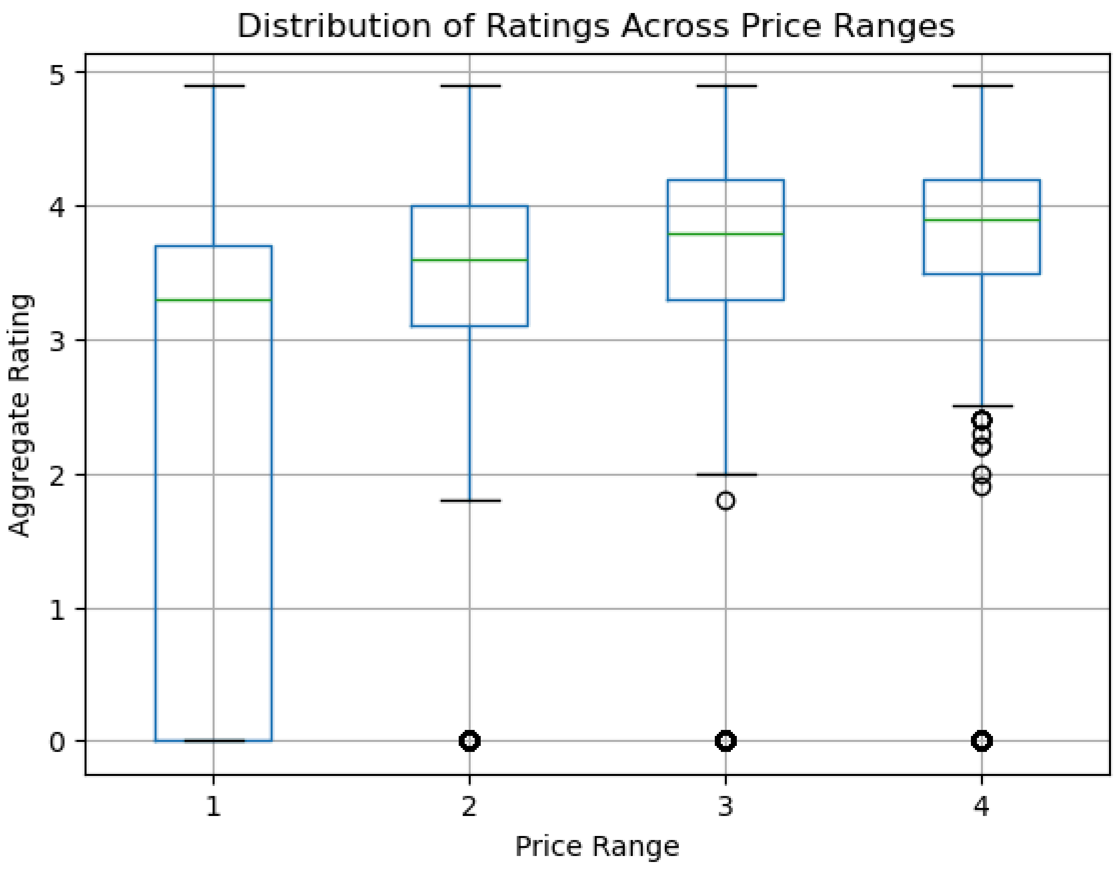
In [10]:
```python
## Most popular cousine is North Indian.
```

```
In [40]: # Keep only rows with both fields present
         df_clean1 = df.dropna(subset=['price_range', 'aggregate_rating'])

         # Compute correlation
         correlation = df_clean1['price_range'].corr(df_clean1['aggregate_rating'])
         print("Correlation between price range and ratings:", correlation)
```

```
Correlation between price range and ratings: 0.2464027186565711
```

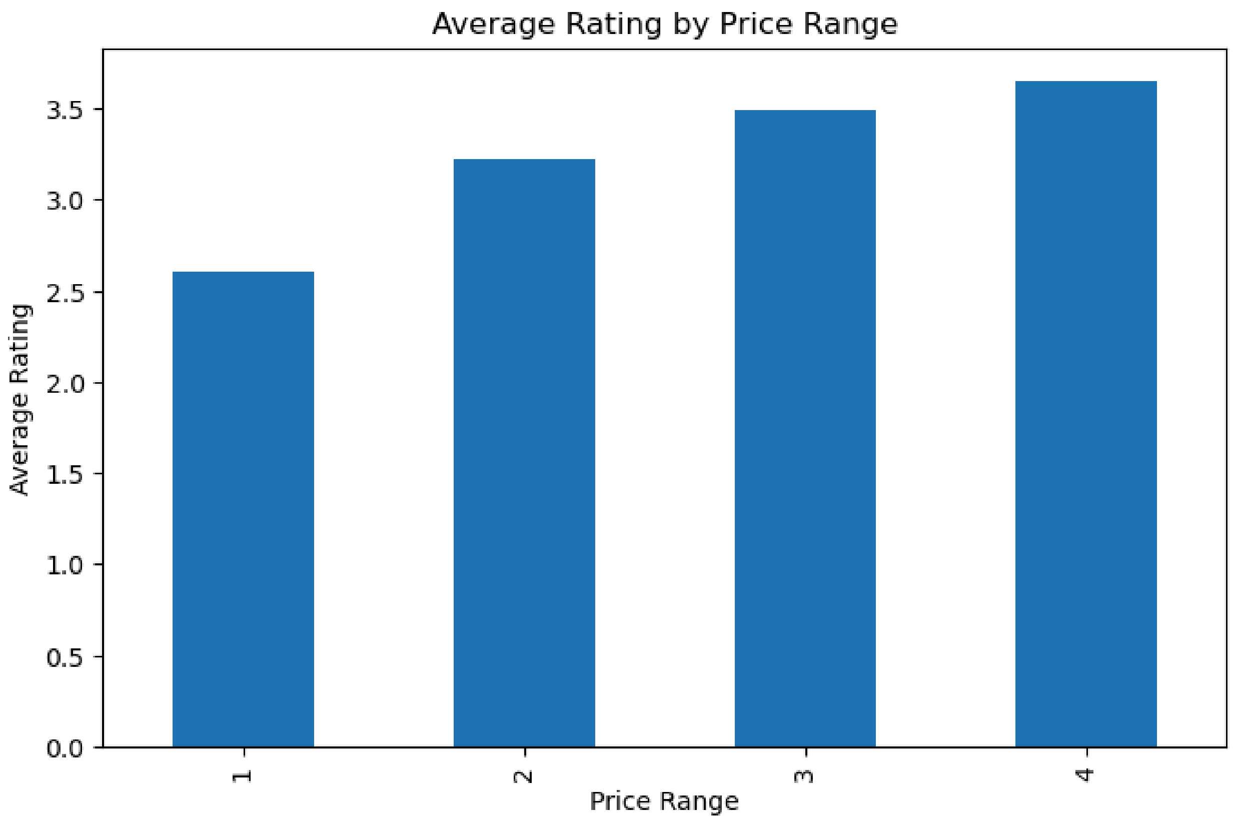
```
In [41]: plt.figure(figsize=(8, 5))
         df_clean.boxplot(column='aggregate_rating', by='price_range')
         plt.xlabel("Price Range")
         plt.ylabel("Aggregate Rating")
         plt.title("Distribution of Ratings Across Price Ranges")
         plt.suptitle("")  # removes default pandas title
         plt.show()
```

```
<Figure size 800x500 with 0 Axes>
```



```
In [29]: mean_ratings = df_clean.groupby('price_range')['aggregate_rating'].mean()
         print(mean_ratings)

         mean_ratings.plot(kind='bar', figsize=(8,5))
         plt.xlabel("Price Range")
         plt.ylabel("Average Rating")
         plt.title("Average Rating by Price Range")
         plt.show()
```

```
price_range
1    2.604473
2    3.218448
3    3.496459
4    3.649107
Name: aggregate_rating, dtype: float64
```

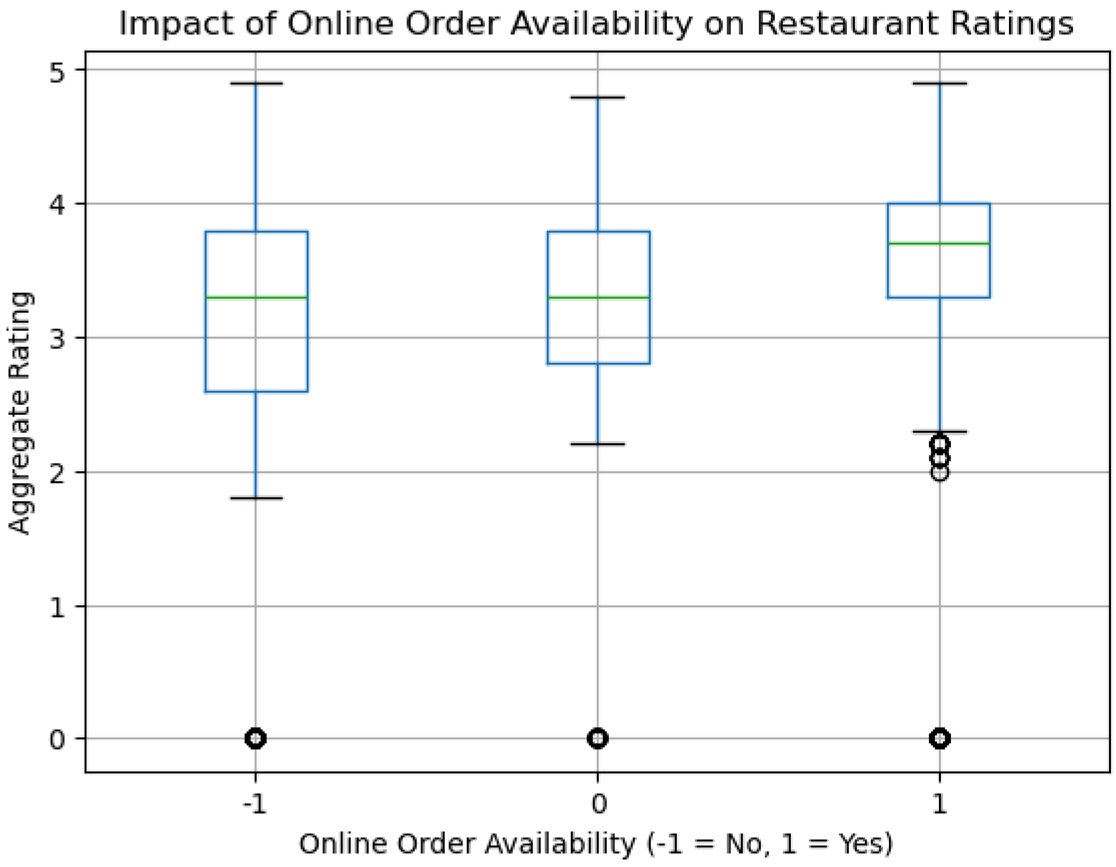


In [42]:
```
# Keep required columns only
df_clean = df.dropna(subset=['delivery', 'aggregate_rating'])

# Average rating by online order availability
avg_ratings = df_clean.groupby('delivery')['aggregate_rating'].mean()

print("Average ratings by online order availability:")
print(avg_ratings)
```

```
Average ratings by online order availability:
delivery
-1    2.739719
 0    2.833866
 1    3.476571
Name: aggregate_rating, dtype: float64
```

In [43]:
```
plt.figure(figsize=(8, 5))
df_clean.boxplot(
    column='aggregate_rating',
    by='delivery'
)
plt.xlabel("Online Order Availability (-1 = No, 1 = Yes)")
plt.ylabel("Aggregate Rating")
plt.title("Impact of Online Order Availability on Restaurant Ratings")
plt.suptitle("")
plt.show()
```

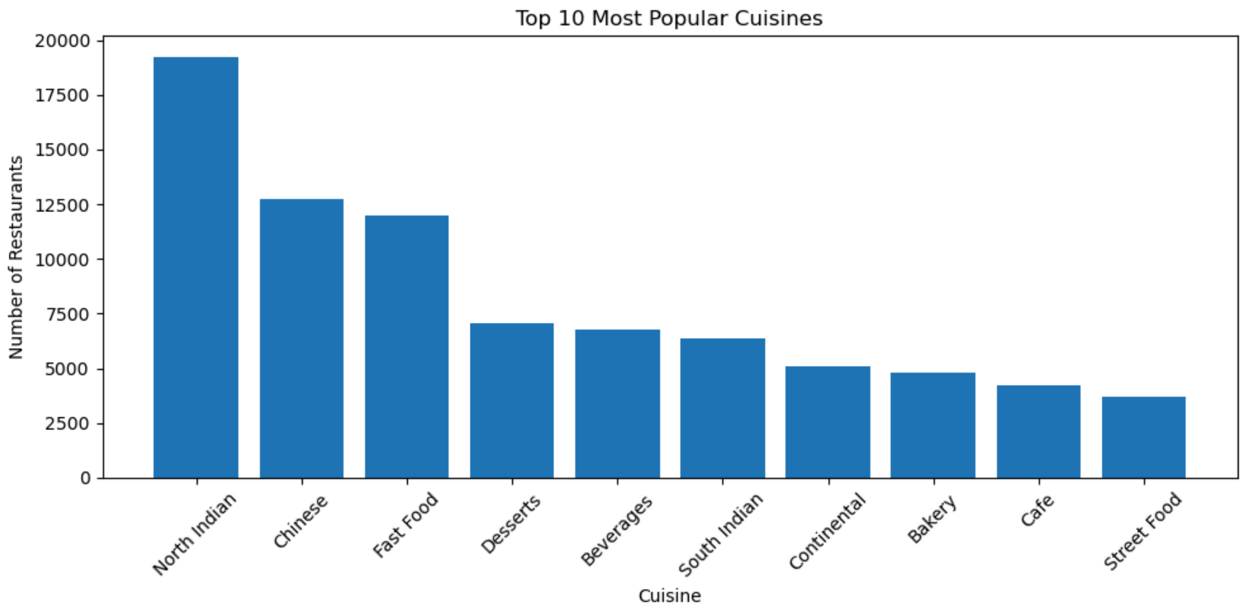
```
<Figure size 800x500 with 0 Axes>
```



In [44]:
```
# Remove missing cuisine values
df = df.dropna(subset=['cuisines'])

# Split multiple cuisines into individual entries
df['cuisines'] = df['cuisines'].str.split(', ')

# Flatten the list of cuisines
all_cuisines = df.explode('cuisines')

# Count cuisine frequency
popular_cuisines = all_cuisines['cuisines'].value_counts()

# Display top 10 cuisines
print("Top 10 Most Popular Cuisines:")
print(popular_cuisines.head(10))
```

```
Top 10 Most Popular Cuisines:
cuisines
North Indian    19226
Chinese         12724
Fast Food       11988
Desserts         7064
Beverages        6754
South Indian     6381
Continental      5076
Bakery           4813
Cafe             4252
Street Food      3715
Name: count, dtype: int64
```

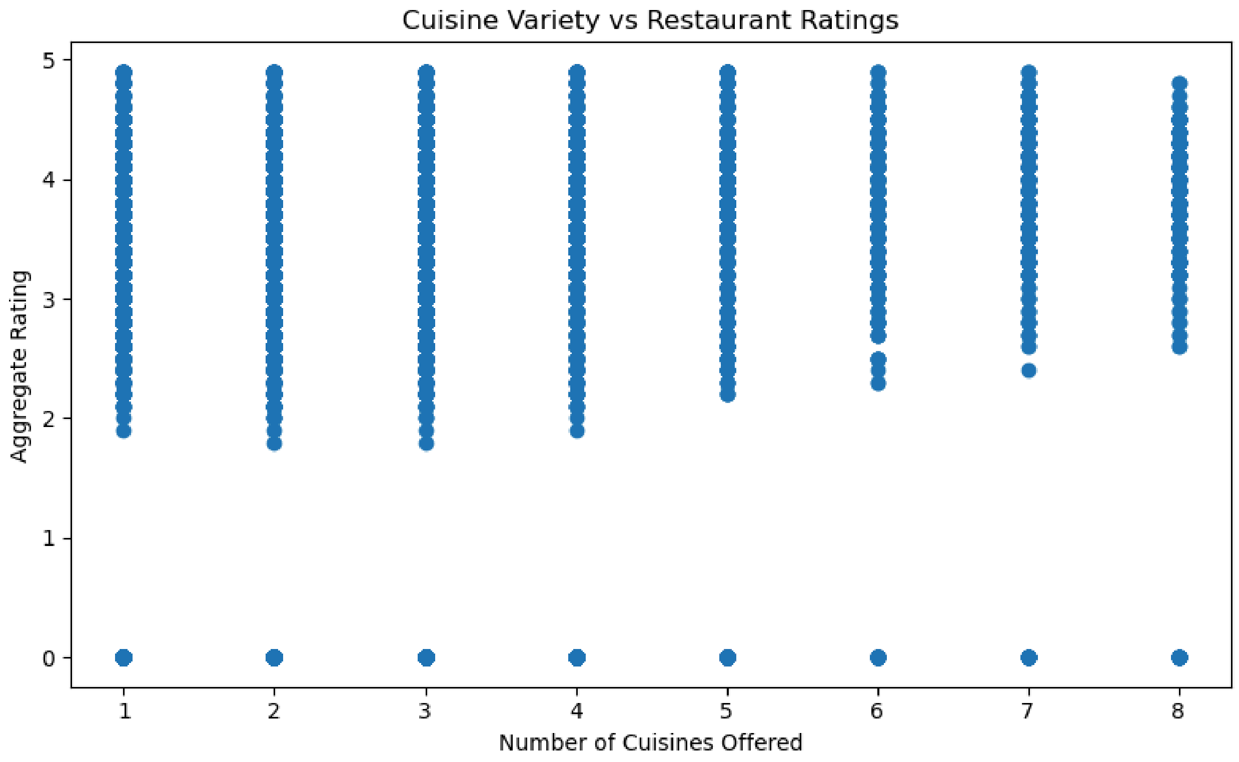
In [33]:
```
top10 = popular_cuisines.head(10)

plt.figure(figsize=(10,5))
plt.bar(top10.index, top10.values)
plt.xticks(rotation=45)
plt.xlabel("Cuisine")
plt.ylabel("Number of Restaurants")
plt.title("Top 10 Most Popular Cuisines")
plt.tight_layout()
plt.show()
```



In [46]:
```
# Drop missing values
df_clean = df.dropna(subset=['cuisines', 'aggregate_rating'])

# Count number of cuisines (list length)
df_clean['cuisine_count'] = df_clean['cuisines'].apply(len)

# Correlation
correlation = df_clean['cuisine_count'].corr(df_clean['aggregate_rating'])
print("Correlation between cuisine variety and ratings:", correlation)
```

```
Correlation between cuisine variety and ratings: 0.2491363607346406
```

```
In [47]: plt.figure(figsize=(8,5))
         plt.scatter(df_clean['cuisine_count'], df_clean['aggregate_rating'])
         plt.xlabel("Number of Cuisines Offered")
         plt.ylabel("Aggregate Rating")
         plt.title("Cuisine Variety vs Restaurant Ratings")
         plt.tight_layout()
         plt.show()
```



Insights: Average Rating increases when number of cousines offered is increased.

```
In [36]: # Remove missing values
         df_clean = df.dropna(subset=['price_range', 'aggregate_rating'])

         # View basic statistics
         print(df_clean[['price_range', 'aggregate_rating']].describe())
```

```
        price_range  aggregate_rating
count  55098.000000      55098.000000
mean       1.719591          2.979478
std        0.879407          1.449025
min        1.000000          0.000000
25%        1.000000          2.900000
50%        1.000000          3.500000
75%        2.000000          3.900000
max        4.000000          4.900000
```

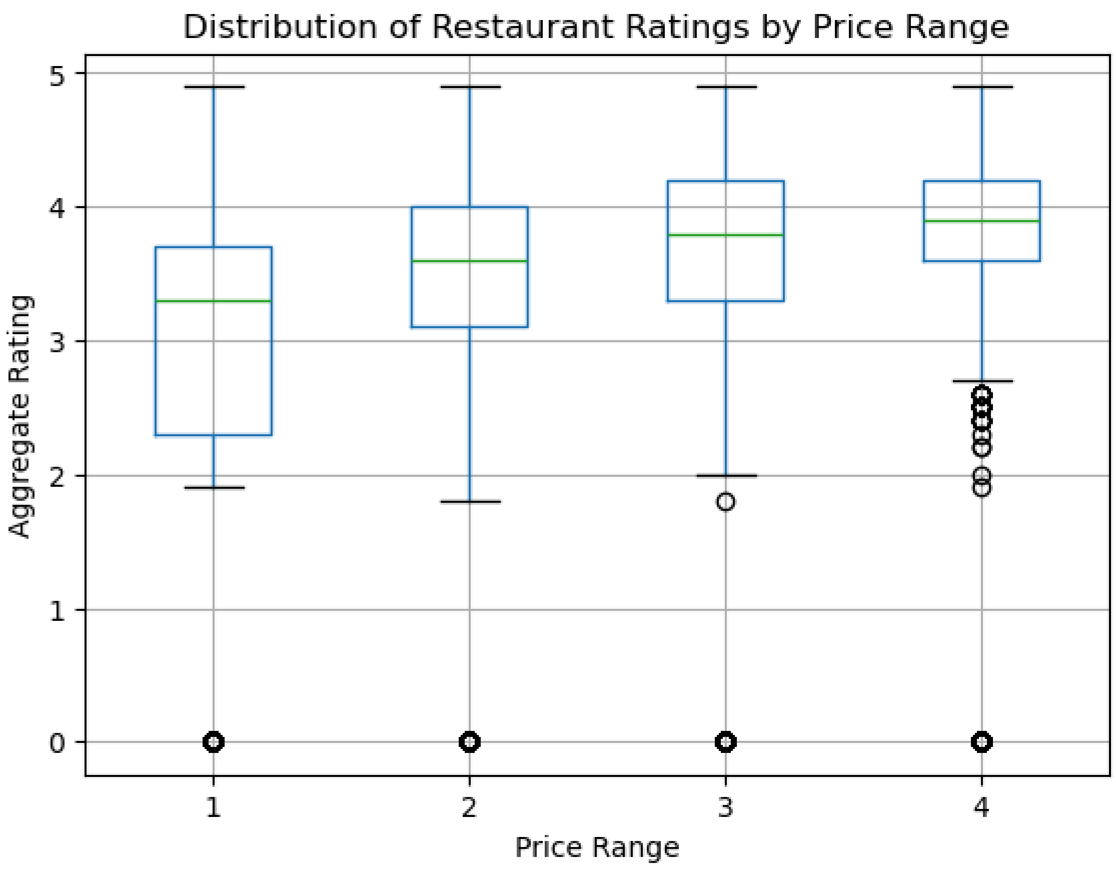
```
In [37]: avg_rating_by_price = (
             df_clean
```

```
    .groupby('price_range')['aggregate_rating']
    .mean()
)

print("Average Rating by Price Range:")
print(avg_rating_by_price)
```

```
Average Rating by Price Range:
price_range
1    2.636904
2    3.223433
3    3.498180
4    3.650698
Name: aggregate_rating, dtype: float64
```

In [42]:
```
plt.figure(figsize=(8,5))
df_clean.boxplot(column='aggregate_rating', by='price_range')
plt.xlabel("Price Range")
plt.ylabel("Aggregate Rating")
plt.title("Distribution of Restaurant Ratings by Price Range")
plt.suptitle("")
plt.show()
```

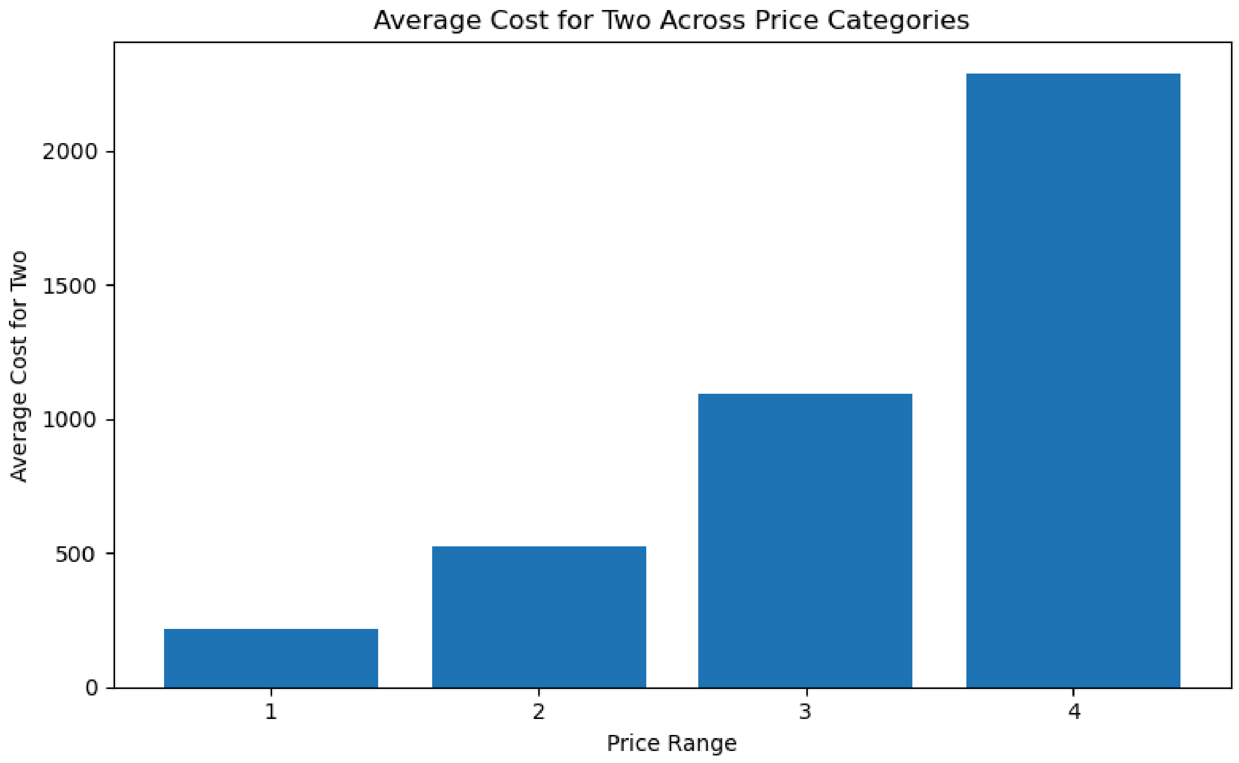
```
<Figure size 800x500 with 0 Axes>
```



In [43]:
```
correlation = df_clean['price_range'].corr(df_clean['aggregate_rating'])
print("Correlation between price range and ratings:", correlation)
```

```
Correlation between price range and ratings: 0.2464027186565711
```

In [44]:
```python
# Remove missing values
df_clean = df.dropna(subset=['price_range', 'average_cost_for_two'])

# Calculate average cost for two per price range
avg_cost = df_clean.groupby('price_range')['average_cost_for_two'].mean()

# Plot
plt.figure(figsize=(8,5))
plt.bar(avg_cost.index.astype(str), avg_cost.values)
plt.xlabel("Price Range")
plt.ylabel("Average Cost for Two")
plt.title("Average Cost for Two Across Price Categories")
plt.tight_layout()
plt.show()
```

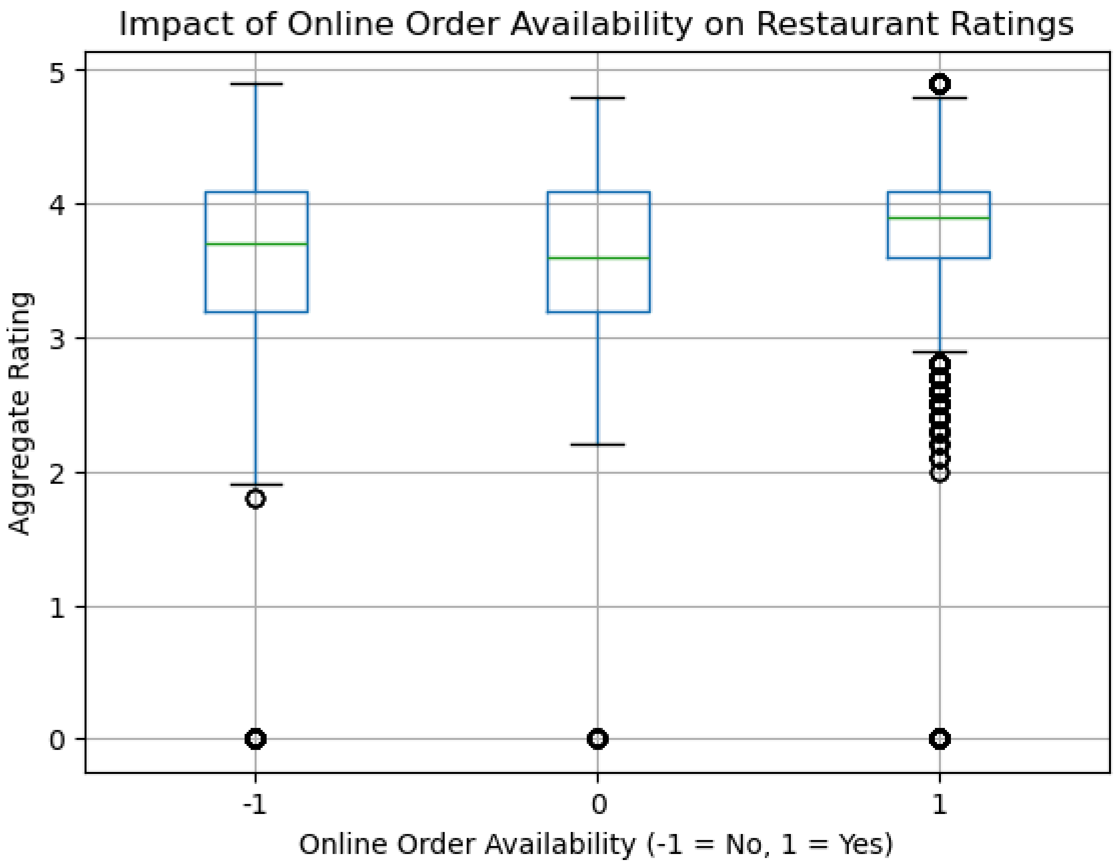


In [62]:
```python
# Remove missing values
df_clean = df.dropna(subset=['delivery', 'aggregate_rating'])

# Average ratings by online order availability
avg_ratings = df_clean.groupby('delivery')['aggregate_rating'].mean()

print("Average ratings:")
print(avg_ratings)
```

```
Average ratings:
delivery
-1    3.219751
 0    3.371567
 1    3.739921
Name: aggregate_rating, dtype: float64
```

In [63]:
```
plt.figure(figsize=(8,5))
df_clean.boxplot(column='aggregate_rating', by='delivery')
plt.xlabel("Online Order Availability (-1 = No, 1 = Yes)")
plt.ylabel("Aggregate Rating")
plt.title("Impact of Online Order Availability on Restaurant Ratings")
plt.suptitle("")
plt.show()
```

```
<Figure size 800x500 with 0 Axes>
```



In [65]:
```
correlation = df_clean['delivery'].corr(df_clean['aggregate_rating'])
print("Correlation:", correlation)
```

```
Correlation: 0.198527627958639
```

The analysis indicates that restaurants offering online ordering (coded as 1) generally receive higher and more consistent ratings compared to those without online ordering (coded as -1). This suggests that convenience and accessibility provided by online ordering positively influence customer satisfaction.

In [45]:
```
# Drop missing values
df_clean = df.dropna(subset=['opentable_support'])

# Count restaurants
table_booking_counts = df_clean['opentable_support'].value_counts()

print("Distribution of Table Booking Availability:")
print(table_booking_counts)
```

```
Distribution of Table Booking Availability:
opentable_support
0.0    55086
Name: count, dtype: int64
```

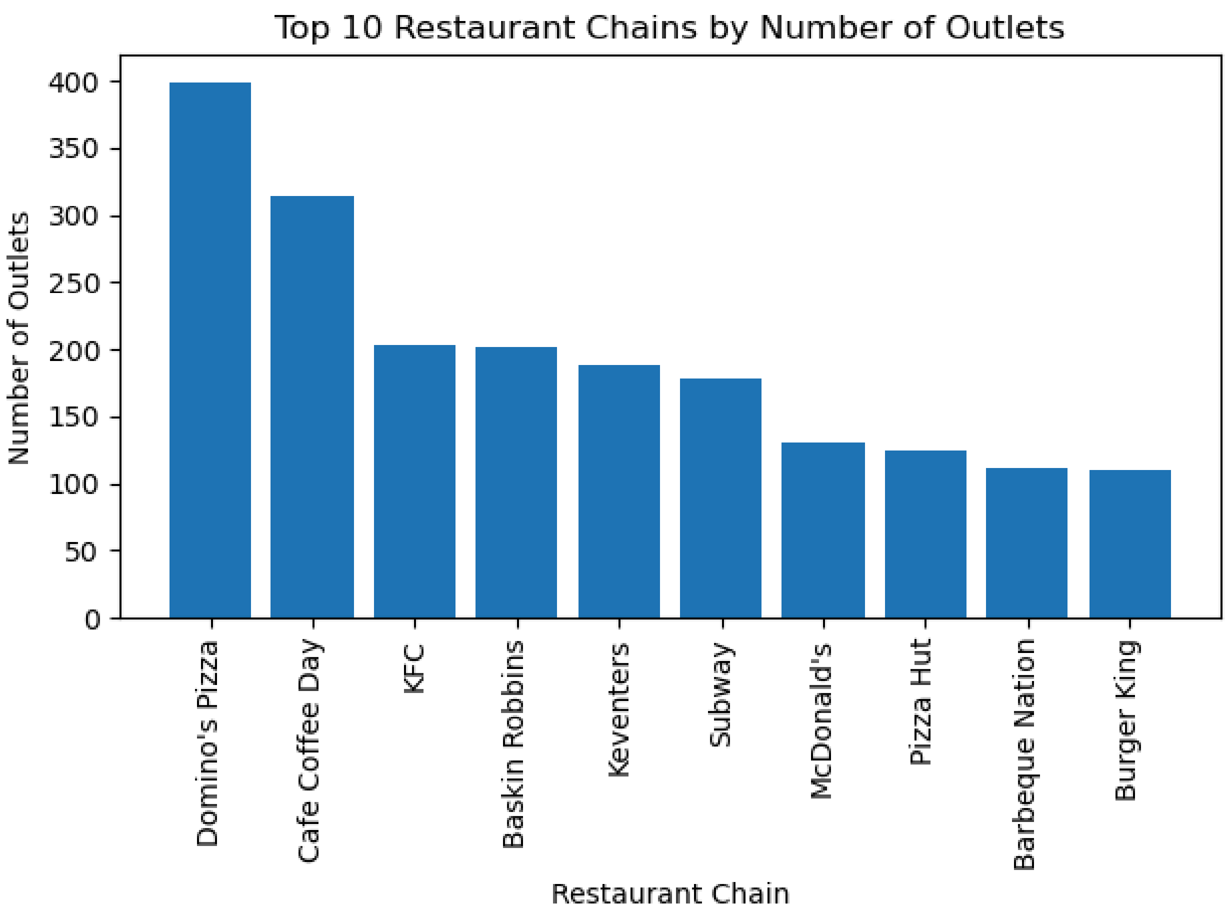
In [46]:
```
percentage_distribution = (
    table_booking_counts / table_booking_counts.sum() * 100
)

print("\nPercentage Distribution:")
print(percentage_distribution)
```

```
Percentage Distribution:
opentable_support
0.0    100.0
Name: count, dtype: float64
```

In [47]:
```
# Count number of outlets per restaurant name
chain_counts = df['name'].value_counts()

# Select top 10 chains
top_chains = chain_counts.head(10)

print("Top 10 Restaurant Chains by Number of Outlets:")
print(top_chains)
```

```
Top 10 Restaurant Chains by Number of Outlets:
name
Domino's Pizza     399
Cafe Coffee Day    315
KFC                203
Baskin Robbins     202
Keventers          189
Subway             178
McDonald's         130
Pizza Hut          125
Barbeque Nation    112
Burger King        110
Name: count, dtype: int64
```

In [39]:
```
plt.figure()
plt.bar(top_chains["name"], top_chains["outlet_count"])
plt.xticks(rotation=90)
plt.xlabel("Restaurant Chain")
plt.ylabel("Number of Outlets")
plt.title("Top 10 Restaurant Chains by Number of Outlets")
plt.tight_layout()
plt.show()
```

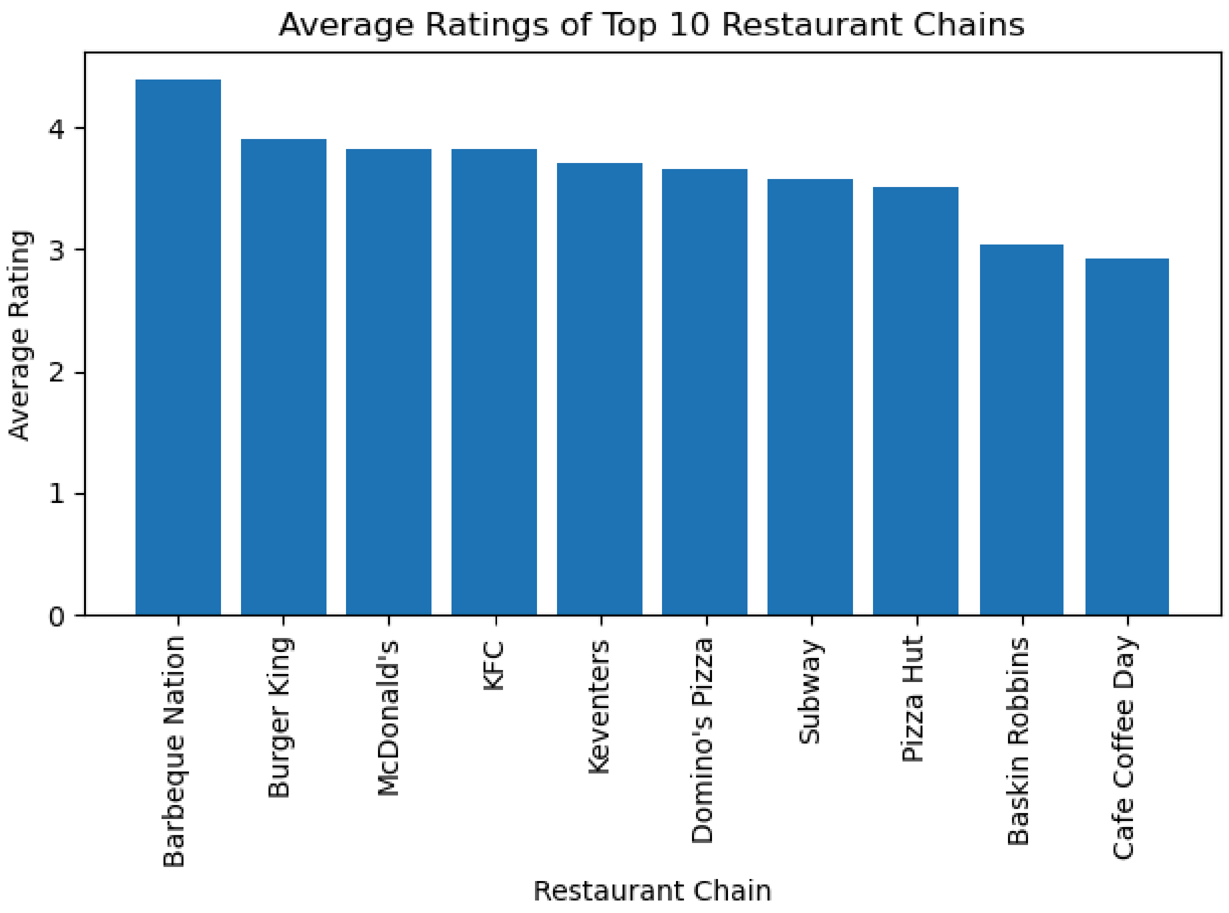


Insight: Dominos is the moost popular outlet.

In [40]:
```
avg_ratings = (
    df[df["name"].isin(top_chains["name"])]
    .groupby("name")["aggregate_rating"]
    .mean()
    .reset_index()
    .sort_values(by="aggregate_rating", ascending=False)
)

print(avg_ratings)
```

```
              name  aggregate_rating
0  Barbeque Nation          4.399107
2      Burger King          3.902727
7       McDonald's          3.825385
5              KFC          3.821182
6        Keventers          3.702116
4   Domino's Pizza          3.665414
9           Subway          3.587640
8        Pizza Hut          3.507200
1   Baskin Robbins          3.044554
3  Cafe Coffee Day          2.923810
```

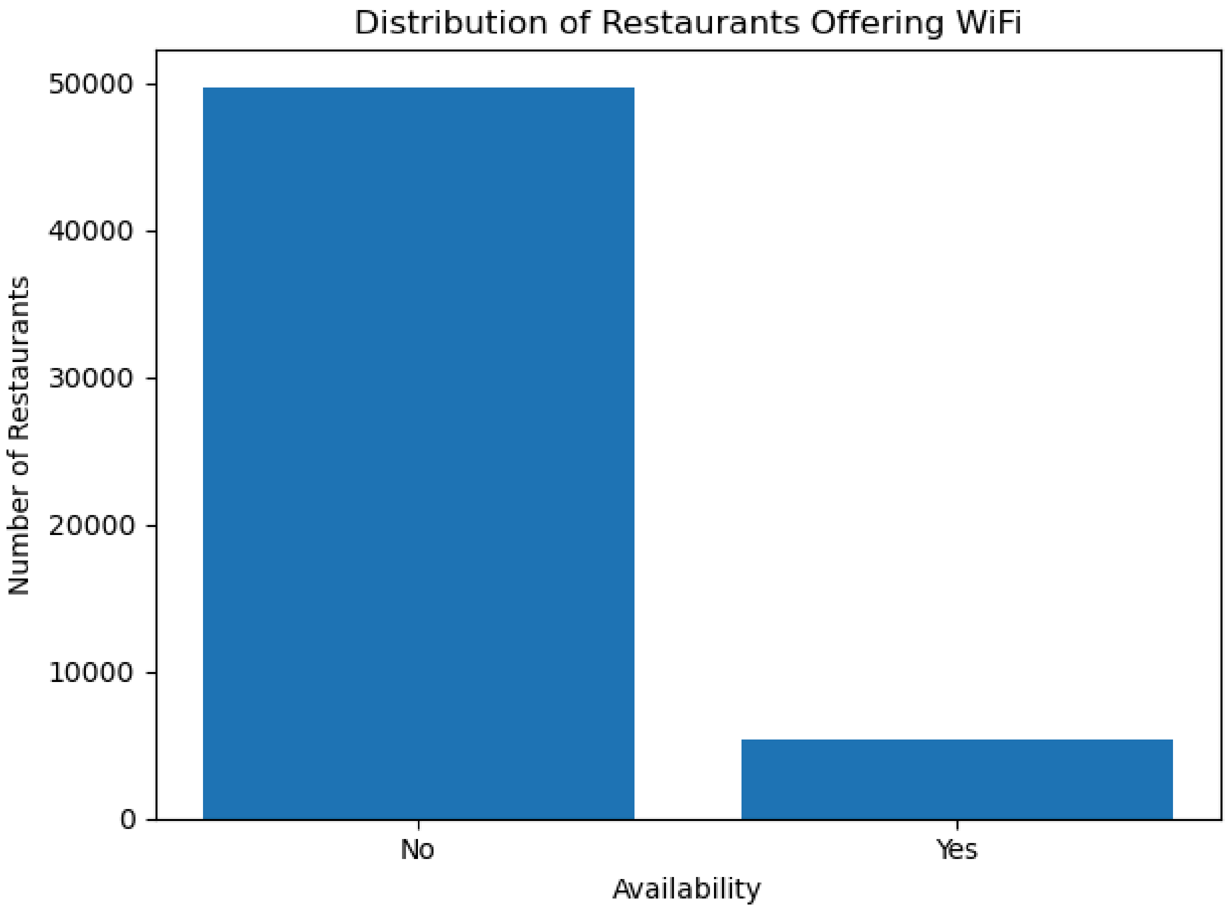
In [41]:
```
plt.figure()
plt.bar(avg_ratings["name"], avg_ratings["aggregate_rating"])
plt.xticks(rotation=90)
plt.xlabel("Restaurant Chain")
plt.ylabel("Average Rating")
plt.title("Average Ratings of Top 10 Restaurant Chains")
plt.tight_layout()
plt.show()
```

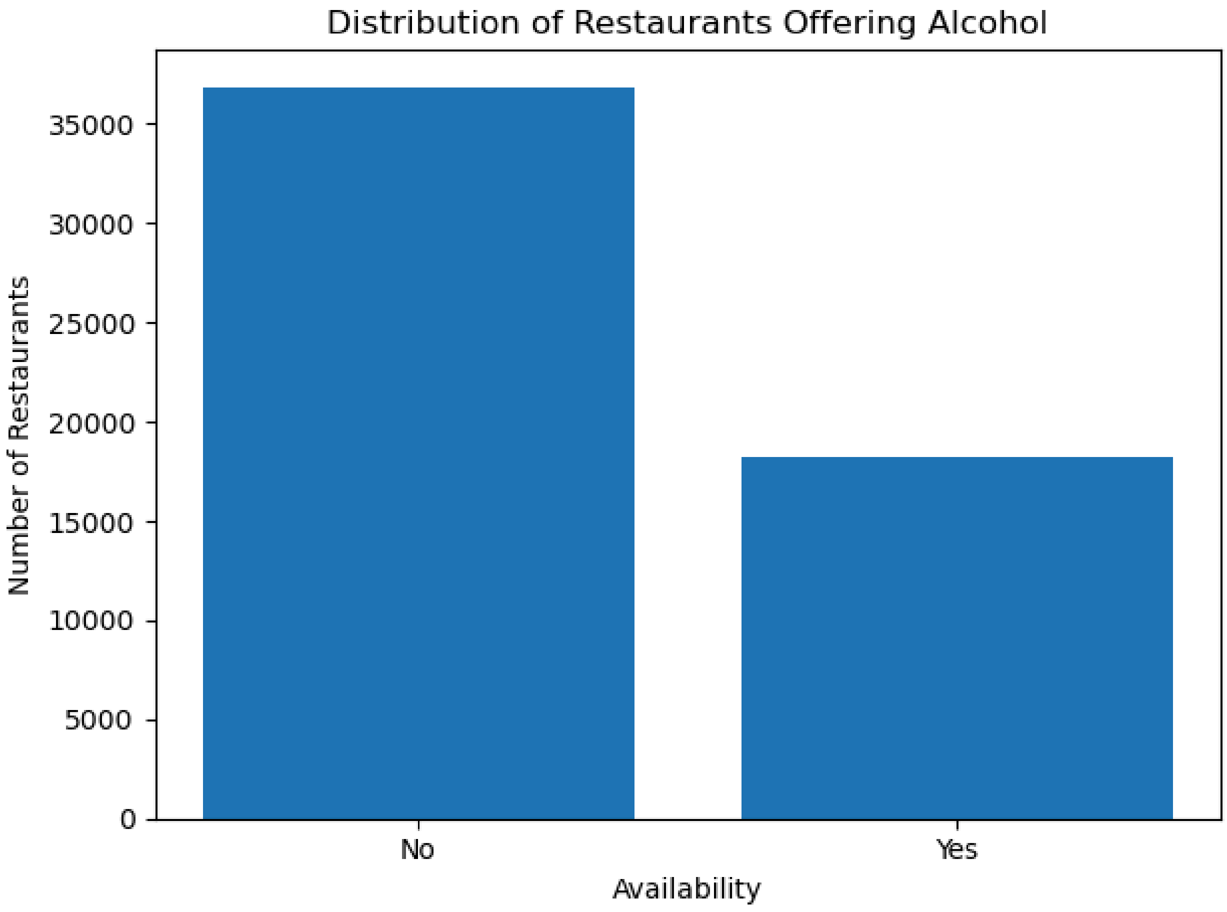


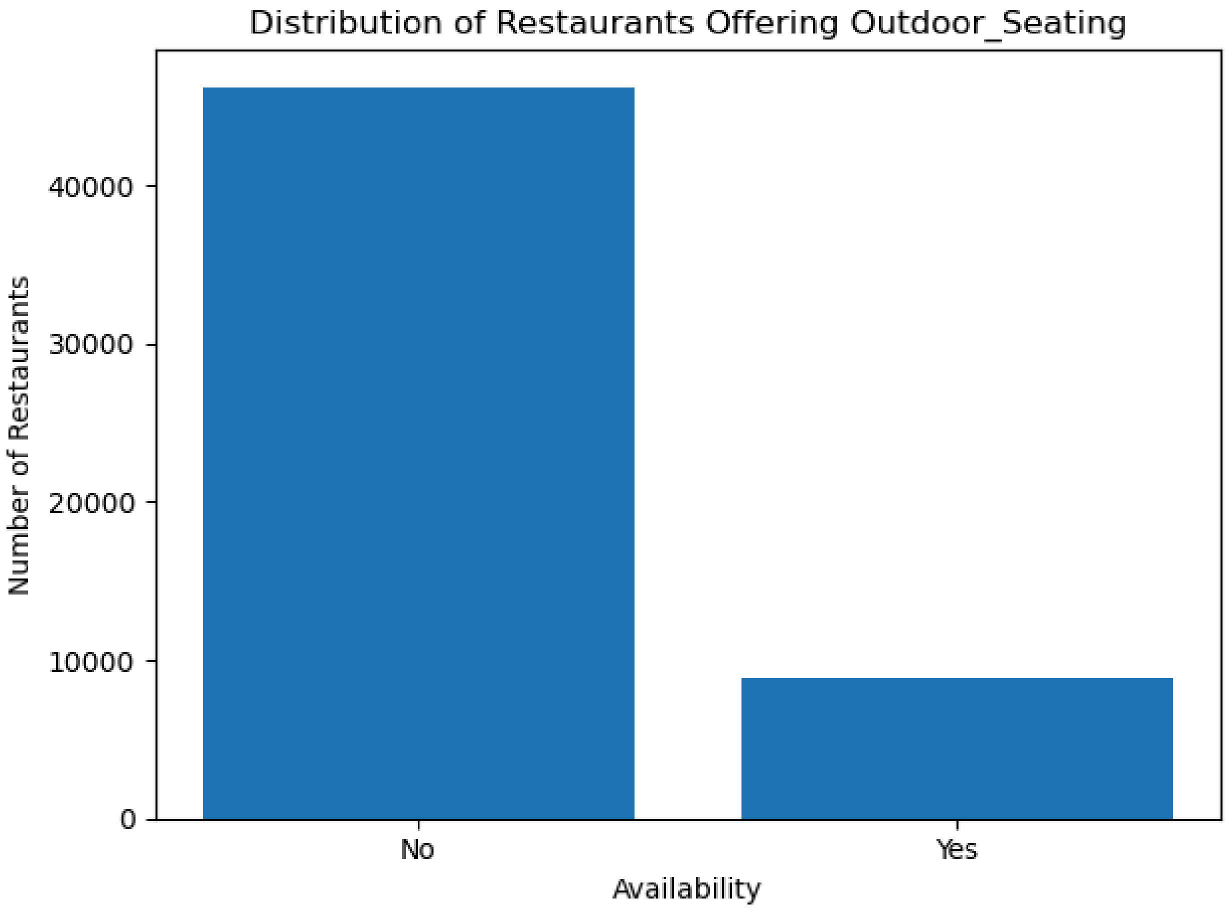
Insights: Barbeque Nation has the best rating among the food chains.

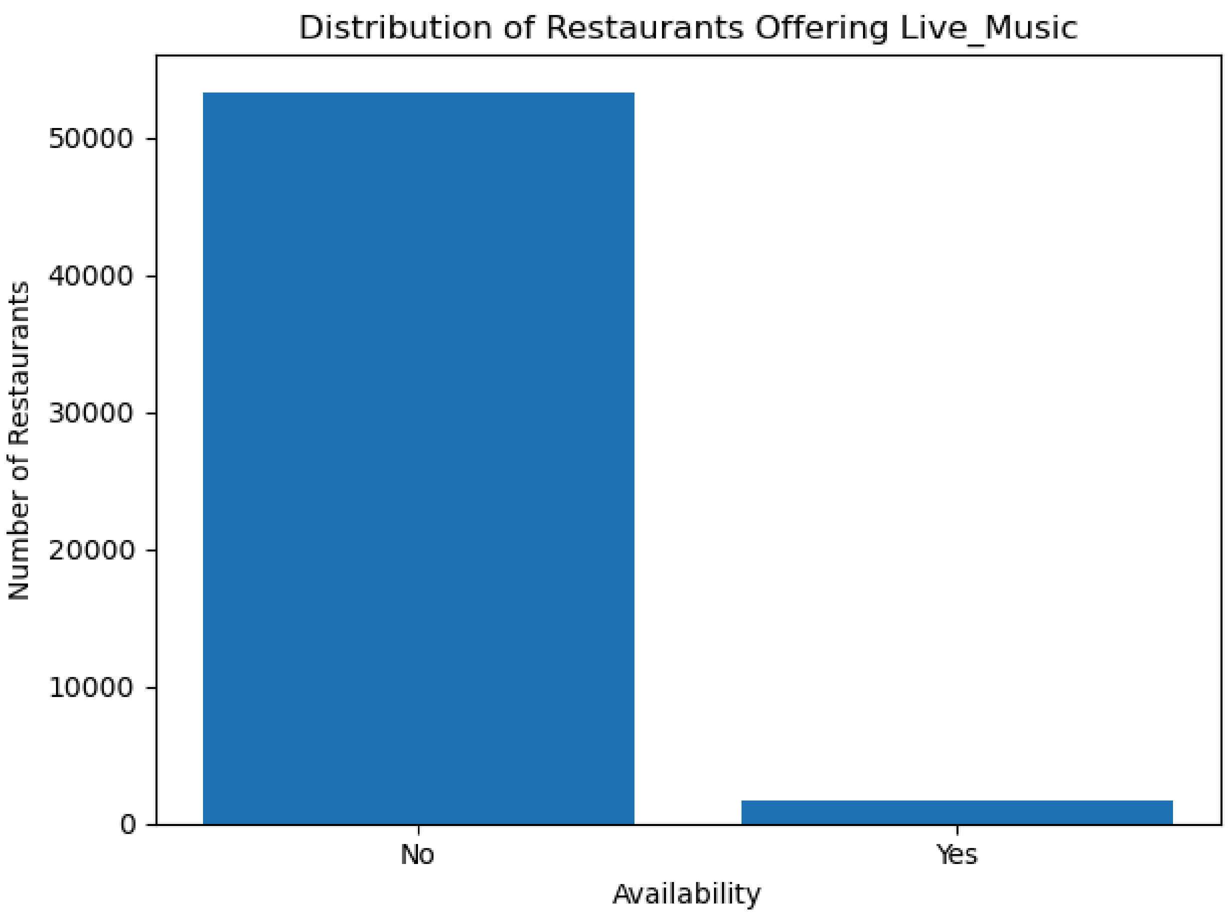
In [42]:
```
df["WiFi"] = df["highlights"].str.contains("Wifi", case=False, na=False)
df["Alcohol"] = df["highlights"].str.contains("Alcohol", case=False, na=False)
df["Outdoor_Seating"] = df["highlights"].str.contains("Outdoor Seating", case=
df["Live_Music"] = df["highlights"].str.contains("Live Music", case=False, na=
```

In [43]:
```
features = ["WiFi", "Alcohol", "Outdoor_Seating", "Live_Music"]

for feature in features:
    counts = df[feature].value_counts()

    plt.figure()
    plt.bar(["No", "Yes"], counts.values)
    plt.title(f"Distribution of Restaurants Offering {feature}")
    plt.xlabel("Availability")
    plt.ylabel("Number of Restaurants")
    plt.tight_layout()
    plt.show()
```




Distribution of Restaurants Offering Alcohol
Number of Restaurants
35000
30000
25000
20000
15000
10000
5000
0
No
Yes
Availability


Distribution of Restaurants Offering Outdoor_Seating
Number of Restaurants
40000
30000
20000
10000
0
No
Yes
Availability



In [44]:
```
feature_summary = pd.DataFrame({
    "Feature": ["Wi-Fi", "Alcohol", "Outdoor Seating", "Live Music"],
    "Restaurants_With_Feature": [
        df["WiFi"].sum(),
        df["Alcohol"].sum(),
        df["Outdoor_Seating"].sum(),
        df["Live_Music"].sum()
    ]
})

print(feature_summary)
```

```
           Feature  Restaurants_With_Feature
0            Wi-Fi                      5351
1          Alcohol                     18223
2  Outdoor Seating                      8882
3       Live Music                      1731
```

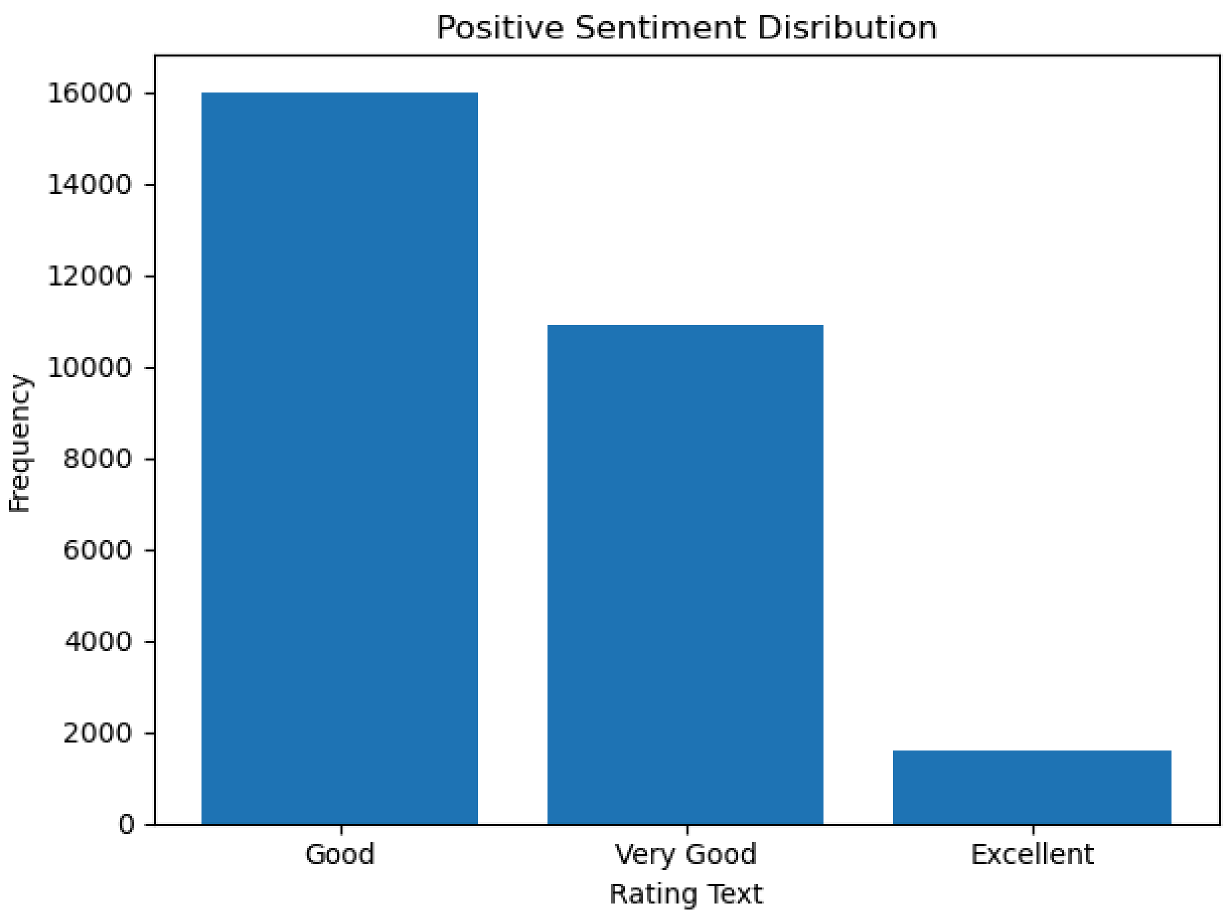
In [45]:
```
features = ["WiFi", "Alcohol", "Outdoor_Seating", "Live_Music"]

rating_comparison = []

for feature in features:
    with_feature = df[df[feature]]["aggregate_rating"].mean()
    without_feature = df[~df[feature]]["aggregate_rating"].mean()
    rating_comparison.append({
        "Feature": feature,
        "Rating_With_Feature": round(with_feature, 2),
        "Rating_Without_Feature": round(without_feature, 2),
        "Rating_Difference": round(with_feature - without_feature, 2)
    })

rating_df = pd.DataFrame(rating_comparison)
print(rating_df)
```

```
          Feature  Rating_With_Feature  Rating_Without_Feature  \
0            WiFi                 3.72                    2.90   
1         Alcohol                 3.32                    2.81   
2  Outdoor_Seating                3.27                    2.92   
3      Live_Music                 3.80                    2.95   

   Rating_Difference  
0               0.82  
1               0.50  
2               0.34  
3               0.85  
```

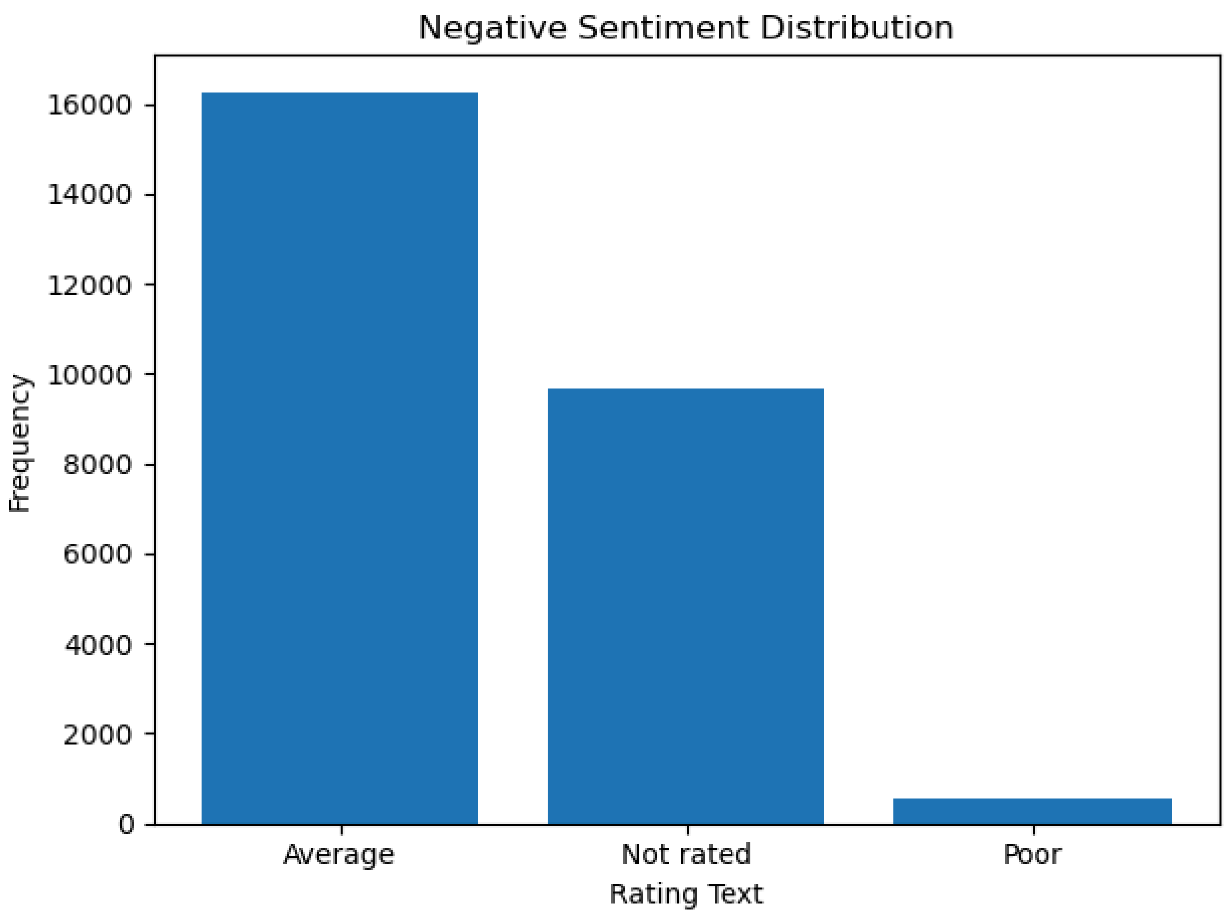
In [46]:
```
positive_reviews = df[df["rating_text"].isin(["Excellent", "Very Good", "Good"
negative_reviews = df[df["rating_text"].isin(["Average", "Poor", "Not rated"])
```

In [54]:
```
positive = df[df["rating_text"].isin(["Excellent", "Very Good", "Good"])]
negative = df[df["rating_text"].isin(["Average", "Poor", "Not rated"])]
pos_counts = positive["rating_text"].value_counts()
neg_counts = negative["rating_text"].value_counts()
```

In [55]:
```
plt.figure()
plt.bar(pos_counts.index, pos_counts.values)
plt.title("Positive Sentiment Disribution")
plt.xlabel("Rating Text")
plt.ylabel("Frequency")
plt.tight_layout()
plt.show()
```

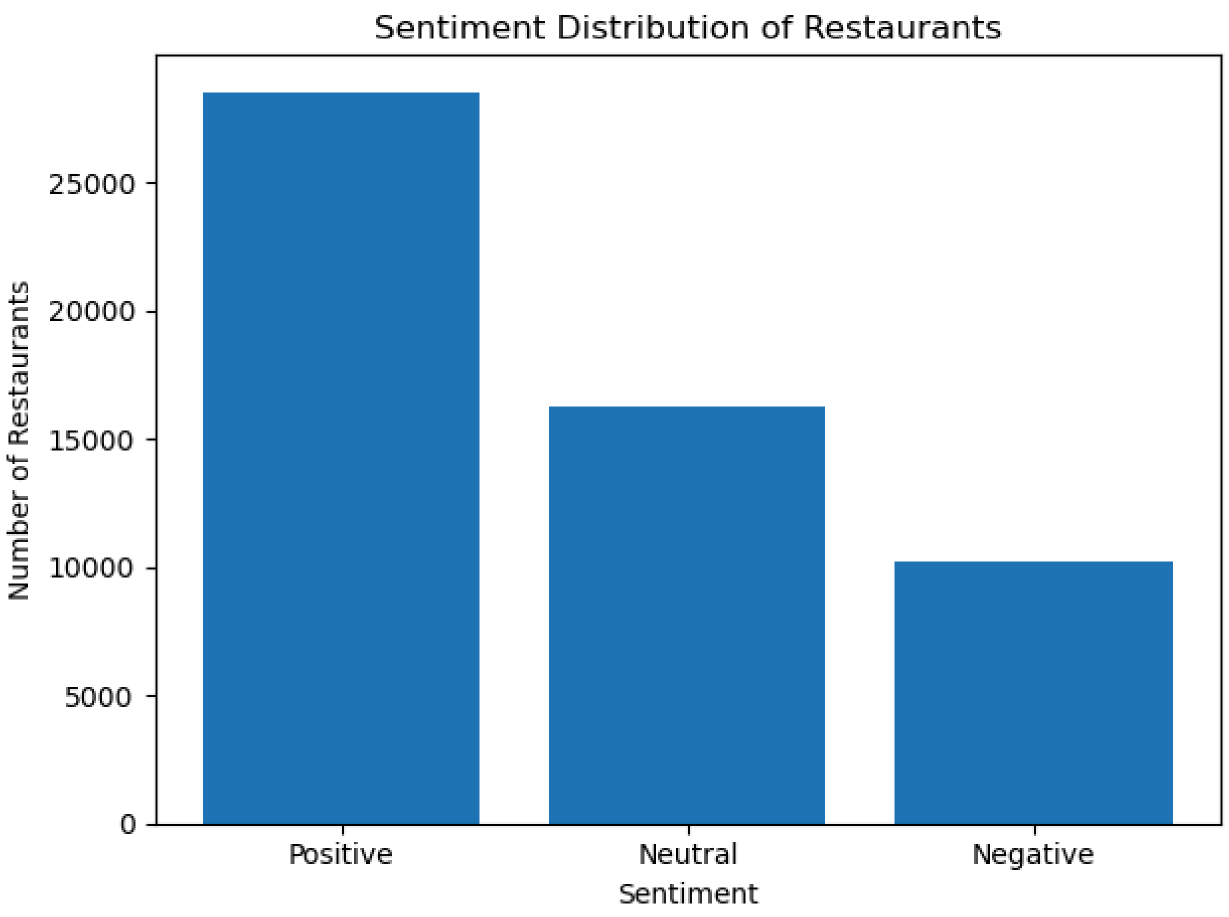


In [56]:
```
plt.figure()
plt.bar(neg_counts.index, neg_counts.values)
plt.title("Negative Sentiment Distribution")
plt.xlabel("Rating Text")
plt.ylabel("Frequency")
plt.tight_layout()
plt.show()
```



In [57]:
```
sentiment_map = {
    "Excellent": "Positive",
    "Very Good": "Positive",
    "Good": "Positive",
    "Average": "Neutral",
    "Poor": "Negative",
    "Not rated": "Negative"
}

df["sentiment"] = df["rating_text"].map(sentiment_map)
```

In [58]:
```
sentiment_counts = df["sentiment"].value_counts()

plt.figure()
plt.bar(sentiment_counts.index, sentiment_counts.values)
plt.title("Sentiment Distribution of Restaurants")
plt.xlabel("Sentiment")
plt.ylabel("Number of Restaurants")
plt.tight_layout()
plt.show()
```



Insights: Most of the restaurents have a positive review by the customer.

In [64]:
```
df["cuisines"] = df["cuisines"].astype(str)
cuisine_words = (
    df["cuisines"]
    .dropna()
    .str.lower()
    .str.split(",")
)

all_words = [word for sublist in cuisine_words for word in sublist]
```

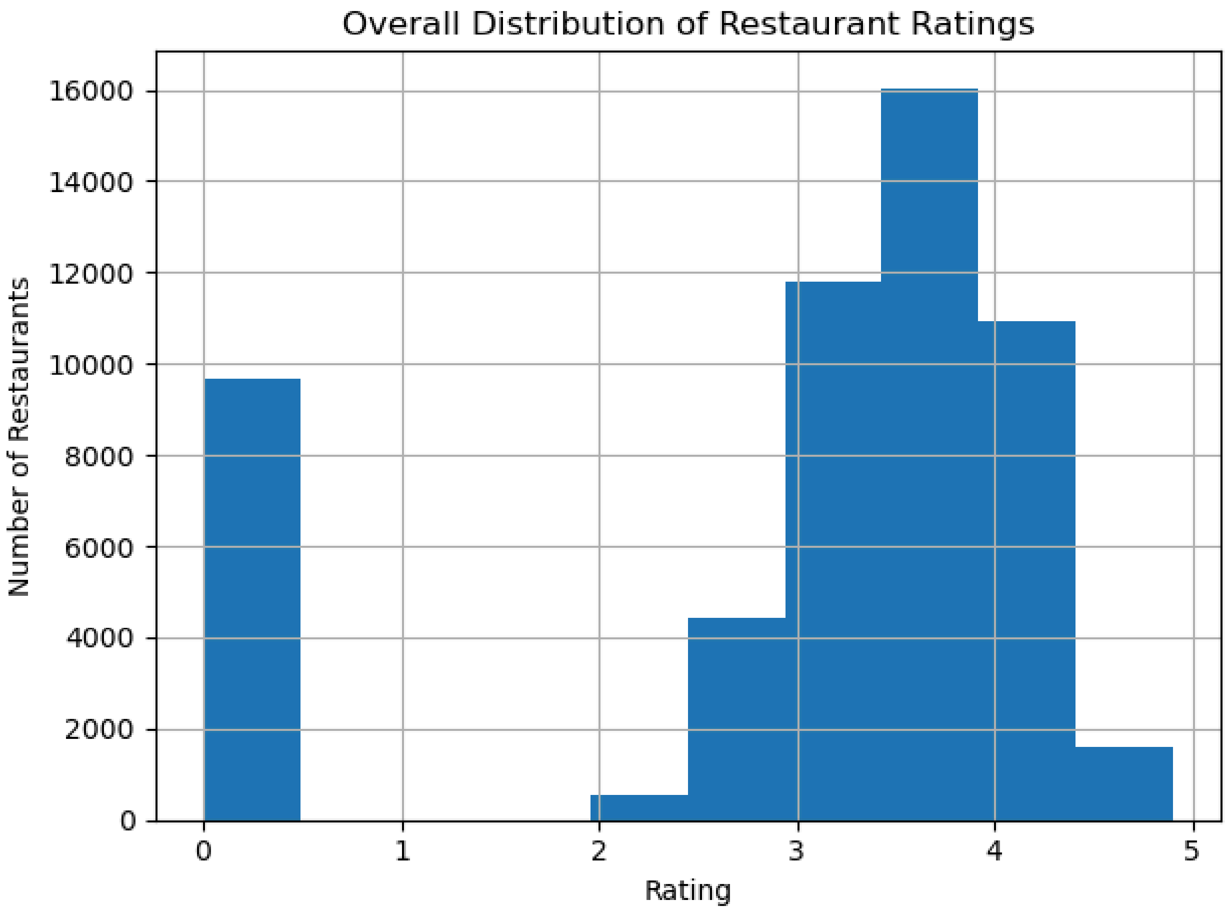
In [65]:
```
df = df[df["cuisines"].notna()]
df["cuisines"] = df["cuisines"].astype(str)
```

In [66]:
```
noise_words = ["nan", "none", ""]

filtered_words = [w for w in all_words if w not in noise_words]
```

In [67]:
```
top_words = Counter(filtered_words).most_common(15)
print(top_words)
```

```
[("['north indian'", 8591), (" 'chinese'", 5359), (" 'fast food']", 5165), ("
'chinese']", 4537), ("['north indian']", 4295), (" 'north indian'", 3810), ("
'beverages']", 3326), (" 'desserts']", 2797), (" 'fast food'", 2576), (" 'north
indian']", 2530), (" 'continental'", 2268), ("['fast food'", 2222), ("['chines
e'", 2221), ("['bakery'", 2207), ("['cafe'", 2112)]
```

In [72]:
```
plt.figure()
df["aggregate_rating"].hist(bins=10)
plt.title("Overall Distribution of Restaurant Ratings")
plt.xlabel("Rating")
plt.ylabel("Number of Restaurants")
plt.tight_layout()
plt.show()
```



Insights: Most of the restaurent have rating between 3.5-4.

In [ ]: