EDA Of Swiggy Sales Data

1. Load and Inspect Data – Read the dataset into a Pandas DataFrame and check for missing values, data types, and basic statistics.

In [57]:
```
import pandas as pd
import matplotlib.pylab as plt

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

Check Missing Values in dataset

In [58]:
```
x=df.isnull().any()
print(x)
# there is no null value in a dataset
```

```
ID              False
Area            False
City            False
Restaurant      False
Price           False
Avg ratings     False
Total ratings   False
Food type       False
Address         False
Delivery time   False
dtype: bool
```

Check Data Type

In [59]:
```
y=df.dtypes
print(y)
```

```
ID               int64
Area            object
City            object
Restaurant      object
Price            int64
Avg ratings    float64
Total ratings    int64
Food type       object
Address         object
Delivery time    int64
dtype: object
```

Basic Statistics

In [60]:
```
print(df.describe())
```

```
                ID         Price  Avg ratings  Total ratings  Delivery time
count  8680.000000  8680.000000  8680.000000    8680.000000    8680.000000
mean   244812.071429   348.444470     3.655104     156.634793      53.967051
std    158671.617188   230.940074     0.647629     391.448014      14.292335
min       211.000000     0.000000     2.000000      20.000000      20.000000
25%     72664.000000   200.000000     2.900000      50.000000      44.000000
50%    283442.000000   300.000000     3.900000      80.000000      53.000000
75%    393425.250000   400.000000     4.200000     100.000000      64.000000
max    466928.000000  2500.000000     5.000000   10000.000000     109.000000
```

2. Summary Statistics – Generate summary statistics for Price, Avg ratings, and Total ratings.

In [61]:
```
z=df[["Price","Avg ratings","Total ratings"]]
print(z.describe())
```

```
             Price  Avg ratings  Total ratings
count  8680.000000  8680.000000    8680.000000
mean    348.444470     3.655104     156.634793
std     230.940074     0.647629     391.448014
min       0.000000     2.000000      20.000000
25%     200.000000     2.900000      50.000000
50%     300.000000     3.900000      80.000000
75%     400.000000     4.200000     100.000000
max    2500.000000     5.000000   10000.000000
```

3.Handle Missing Values – Identify and fill or remove missing values if any.

We already check missing values , so there is no any missing value

4. Convert Data Types – Ensure numerical columns (Price, Avg ratings, Total ratings) are in the correct format.

In [62]:
```
df["Price"].astype(int)
df["Avg ratings"].astype(float)
df["Total ratings"].astype(int)
```

Out[62]:
```
0       100
1       100
2       100
3       500
4        50
       ...
8675     80
8676     80
8677     80
8678     80
8679     80
Name: Total ratings, Length: 8680, dtype: int32
```

5. Standardize Column Names – Convert column names to lowercase and replace spaces with underscores.

In [63]:
```
df.columns=df.columns.str.lower().str.replace(" ","_")
print(df)
```

```
          id                    area       city                restaurant  \
0        211              Koramangala  Bangalore              Tandoor Hut
1        221              Koramangala  Bangalore            Tunday Kababi
2        246                Jogupalya  Bangalore                  Kim Lee
3        248              Indiranagar  Bangalore        New Punjabi Hotel
4        249              Indiranagar  Bangalore                      Nh8
...      ...                      ...        ...                      ...
8675  464626  Panjarapole Cross Road  Ahmedabad               Malt Pizza
8676  465835                   Rohini      Delhi  Jay Mata Ji Home Kitchen
8677  465872                   Rohini      Delhi      Chinese Kitchen King
8678  465990                   Rohini      Delhi    Shree Ram Paratha Wala
8679  466488              Navrangpura  Ahmedabad              Sassy Street

      price  avg_ratings  total_ratings  \
0       300          4.4            100
1       300          4.1            100
2       650          4.4            100
3       250          3.9            500
4       350          4.0             50
...     ...          ...            ...
8675    500          2.9             80
8676    200          2.9             80
8677    150          2.9             80
8678    150          2.9             80
8679    250          2.9             80

                                           food_type       address  \
0             Biryani,Chinese,North Indian,South Indian     5Th Block
1                                     Mughlai,Lucknowi     5Th Block
2                                              Chinese   Double Road
3                 North Indian,Punjabi,Tandoor,Chinese  80 Feet Road
4     Rajasthani,Gujarati,North Indian,Snacks,Desser...  80 Feet Road
...                                                 ...           ...
8675                                           Pizzas   Navrangpura
8676                                     South Indian        Rohini
8677                         Chinese,Snacks,Tandoor        Rohini
8678                   North Indian,Indian,Snacks        Rohini
8679                        Chaat,Snacks,Chinese   Navrangpura

      delivery_time
0                59
1                56
2                50
3                57
4                63
...             ...
8675             40
8676             28
8677             58
8678             28
8679             44

[8680 rows x 10 columns]
```

6. Top 5 Expensive Restaurants – Find the five most expensive restaurants based on Price.

In [64]:
```
sorted_price=df.sort_values(by="price",ascending=False).head(5)
print(sorted_price[["restaurant","price"]])
```

```
                                restaurant  price
3079            Malgudi - The Savera Hotel   2500
2934          Itc Windsor - Gourmet Couch    2500
4718  Origami Japanese & Korean Restaurant   2500
1377                    Cafe Delhi Heights   2000
8485     Lubov Patisserie By Frozen Bottle   2000
```

7. Top Rated Restaurants – List restaurants with an Avg ratings of 4.5 and above.

In [65]:
```
top_rating=df[df["avg_ratings"]>=4.5].sort_values(by="avg_ratings",ascending=Fal
print(top_rating[["restaurant","avg_ratings"]])
```

```
             restaurant  avg_ratings
8571             Afresh          5.0
5519        Cafe Kokomo          5.0
5425  The Asian Pavilion         5.0
5424    Get In My Belly          5.0
5684          Papacream          5.0
...                 ...          ...
3306       Rocket Momos          4.5
3293   Cafe Coffee Hutt          4.5
3291  That Waffle Place!         4.5
3268  New Famous Chinese         4.5
4386    Pimlico Kothrud          4.5

[662 rows x 2 columns]
```

8. Average Price by Food Type – Calculate the average price of different Food type categories.

In [66]:
```
avg_by_food=df.groupby("food_type")["price"].mean()
print(avg_by_food)
```

```
food_type
Afghani,Arabian,Indian,Tandoor                                 850.000000
Afghani,Biryani                                                400.000000
Afghani,Mughlai                                                300.000000
American                                                       405.714286
American  Beverages  Fast Food                                 350.000000
                                                                  ...
Tibetan,Lebanese,Fast Food,Tandoor                             200.000000
Tribal,Seafood,Chinese                                        1200.000000
Turkish                                                        883.333333
Turkish,Arabian                                                300.000000
Turkish,Mediterranean,Middle Eastern,Lebanese,Arabian         1500.000000
Name: price, Length: 3734, dtype: float64
```

9. Most Popular Cities – Find which cities have the most restaurants.

In [67]:
```
most_rest=df.groupby("city")["restaurant"].count()
print(most_rest)
```

```
city
Ahmedabad     717
Bangalore     946
Chennai      1106
Delhi         611
Hyderabad    1075
Kolkata      1346
Mumbai       1277
Pune         1090
Surat         512
Name: restaurant, dtype: int64
```

10. Fastest Delivery Restaurant – Identify the restaurant with the least Delivery time.

In [68]:
```
fast_delivery_time=df.loc[df["delivery_time"].idxmin(),["restaurant","delivery_t
print(fast_delivery_time)
```

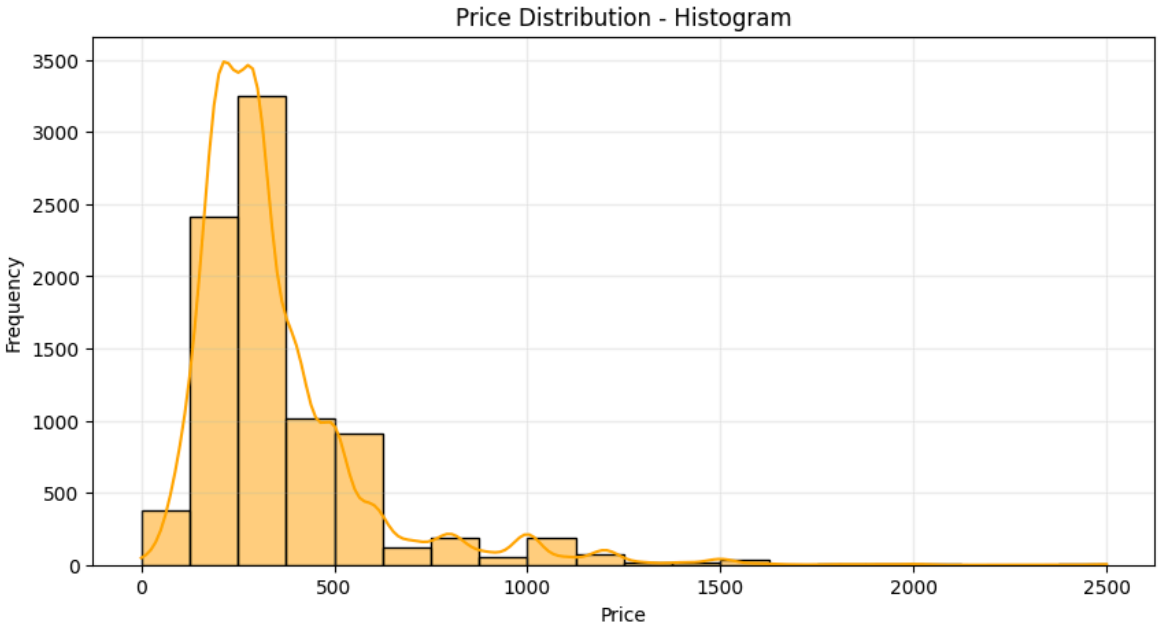
```
restaurant       Scoops
delivery_time        20
Name: 6506, dtype: object
```

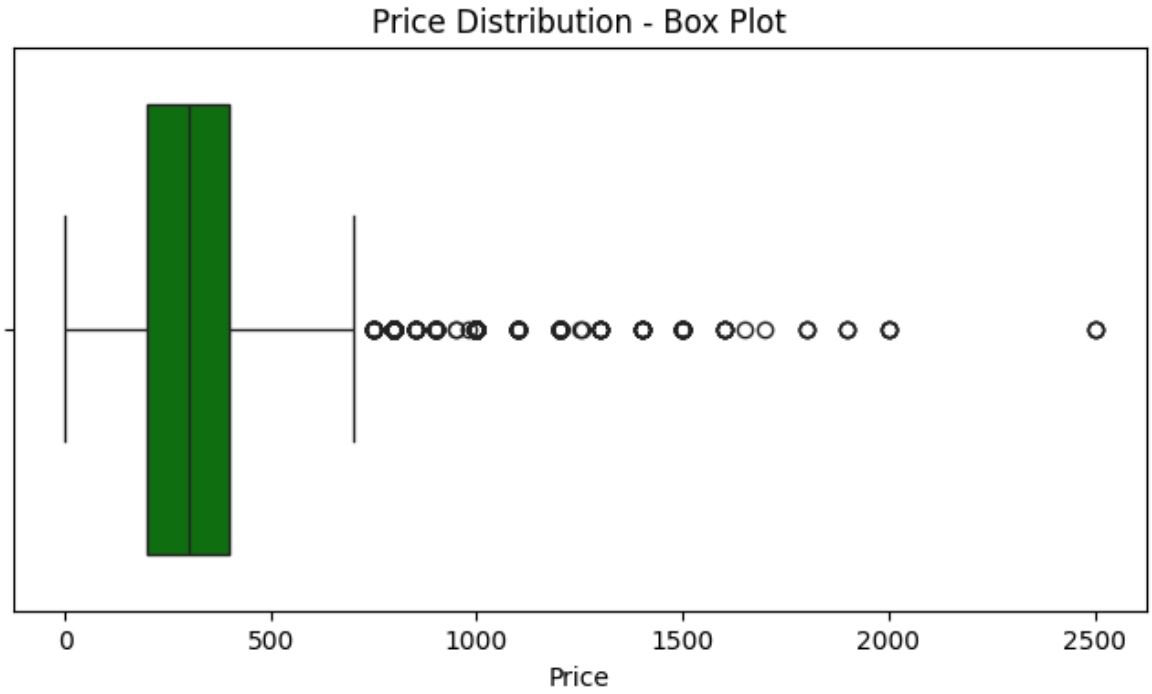
Visualization

In [69]:
```
import matplotlib.pylab as plt
import seaborn as sns
```

1. Price Distribution – Create a histogram or box plot of Price.

In [70]:
```
# create a histogram
plt.figure(figsize=(10, 5))
sns.histplot(df['price'], bins=20, kde=True, color='orange')
plt.title('Price Distribution - Histogram')
plt.xlabel('Price')
plt.ylabel('Frequency')
plt.grid(alpha=0.2)
plt.show()

# Create a box plot
plt.figure(figsize=(8, 4))
sns.boxplot(x=df['price'], color='green')
plt.title('Price Distribution - Box Plot')
plt.xlabel('Price')
plt.show()
```





Insights from the Histogram:

1. **Right-Skewed Distribution:**
   - The histogram is **positively skewed**, meaning most restaurants offer food at lower prices, while a few have higher prices.
   - The peak is around **100 to 300**, indicating that most food items fall within this price range.
2. **Most Frequent Price Range:**
   - The highest bar is between **100 to 300**, suggesting that most restaurants price their items in this range.
   - Prices beyond **600–1000** are significantly less frequent.
3. **Outliers in Higher Price Ranges:**

- There are some restaurants with prices going **above 1000, even up to 2500**, but they are rare.
- This suggests the presence of **premium restaurants** with high-end pricing.

4. **Market Competition Insight:**

- Since most prices are clustered in the lower range, the market likely has **high competition in budget-friendly restaurants**.
- Only a few restaurants cater to **high-end pricing**.

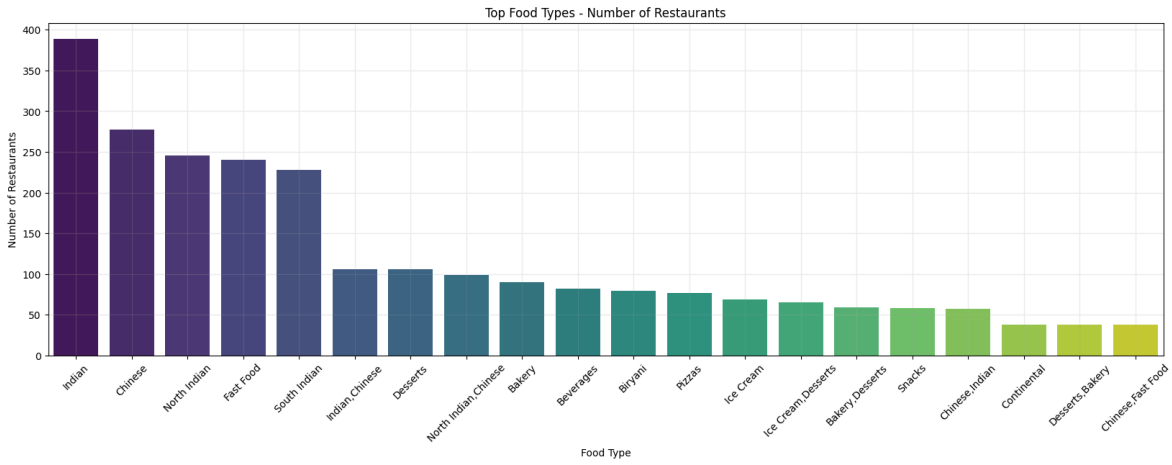
Conclusion:

The histogram suggests that the majority of Swiggy restaurants focus on **affordable pricing**, making food accessible to a larger audience. However, a small percentage of restaurants offer **premium-priced** food.

12. Top Food Types – Create a bar chart showing the number of restaurants per Food type.

In [ ]:
```
food_type_counts = df['food_type'].value_counts().head(20)

# Plotting the bar chart
plt.figure(figsize=(20, 6))
sns.barplot(x=food_type_counts.index, y=food_type_counts.values, palette="viridi
plt.xticks(rotation=45)
plt.title("Top Food Types - Number of Restaurants")
plt.xlabel("Food Type")
plt.ylabel("Number of Restaurants")
plt.grid(alpha=0.2)
plt.show()
```

```
C:\Users\DAKSH\AppData\Local\Temp\ipykernel_2568\2344947050.py:5: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v
0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effe
ct.

  sns.barplot(x=food_type_counts.index, y=food_type_counts.values, palette="virid
is")
```



Insights from the Bar Chart (Top Food Types - Number of Restaurants):

1. **Most Popular Food Types:**

- **Indian cuisine** is the most dominant, with the highest number of restaurants (~400).
- **Chinese cuisine** follows, showing its strong demand.
- **North Indian, Fast Food, and South Indian** cuisines also have a significant presence, indicating their popularity.

2. **Diversity in Food Offerings:**

- The chart highlights a **wide variety of food types**, including **Desserts, Bakery, Beverages, Pizzas, and Biryani**.
- There is a mix of both **traditional and modern** food types.

3. **Fusion & Combo Cuisines:**

- Some restaurants serve a **combination of cuisines**, such as **Indian-Chinese, North Indian-Chinese, and Bakery-Desserts**.
- This suggests a trend where restaurants offer **multi-cuisine** options to attract a wider customer base.

4. **Lesser Common Food Types:**

- **Continental, Chinese-Fast Food, and Desserts-Bakery** have relatively fewer restaurants, indicating a niche market.
- While they have a smaller share, they cater to a specific customer segment.

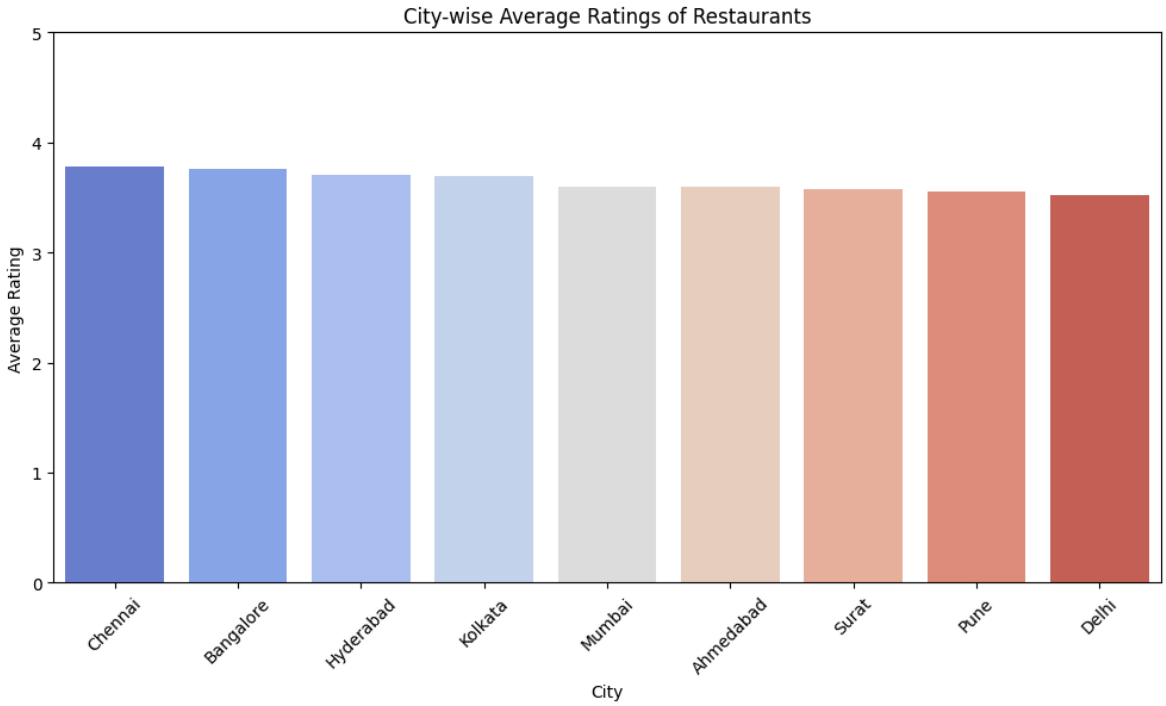
Conclusion:

The Swiggy dataset reveals that **Indian, Chinese, and Fast Food** are the most widely available cuisines. Meanwhile, **desserts and bakery items** also have a notable presence, catering to snack and sweet lovers. The presence of **fusion food types** indicates an evolving food market where restaurants are adapting to diverse customer preferences. 🚀

13. City-wise Avg Ratings – Plot a bar chart showing the average rating of restaurants in each city.

In [ ]:
```
rest_avg_rating= df.groupby("city")["avg_ratings"].mean().sort_values(ascending=

plt.figure(figsize=(12, 6))
sns.barplot(x=rest_avg_rating.index, y=rest_avg_rating.values, palette="coolwarm
plt.xticks(rotation=45)
plt.title("City-wise Average Ratings of Restaurants")
plt.xlabel("City")
plt.ylabel("Average Rating")
plt.ylim(0, 5)
plt.show()
```

```
C:\Users\DAKSH\AppData\Local\Temp\ipykernel_2568\2156206695.py:4: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v
0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effe
ct.

  sns.barplot(x=rest_avg_rating.index, y=rest_avg_rating.values, palette="coolwar
m")
```



Insights from the City-wise Average Ratings of Restaurants Chart:

1. **Consistent Ratings Across Cities**
   - The average ratings across all cities appear to be within a narrow range (~3.5 to ~3.8).
   - This suggests that restaurant quality and customer satisfaction levels are fairly consistent across different locations.
2. **Top-Rated Cities**
   - **Chennai, Bangalore, and Hyderabad** have the highest average ratings, indicating a relatively better dining experience.
   - These cities might have a better food culture, quality of service, or customer satisfaction.
3. **Lower-Rated Cities**
   - **Delhi, Pune, and Surat** have slightly lower average ratings compared to other cities.
   - This could be due to higher competition, diverse restaurant quality, or different customer expectations.
4. **Possible Reasons for Rating Variations**
   - **Bigger cities like Delhi and Mumbai** may have a wider variety of restaurants, including lower-rated ones, which bring down the average.
   - Cities with **higher-rated restaurants may have more premium eateries, better food hygiene, or higher customer service standards**.

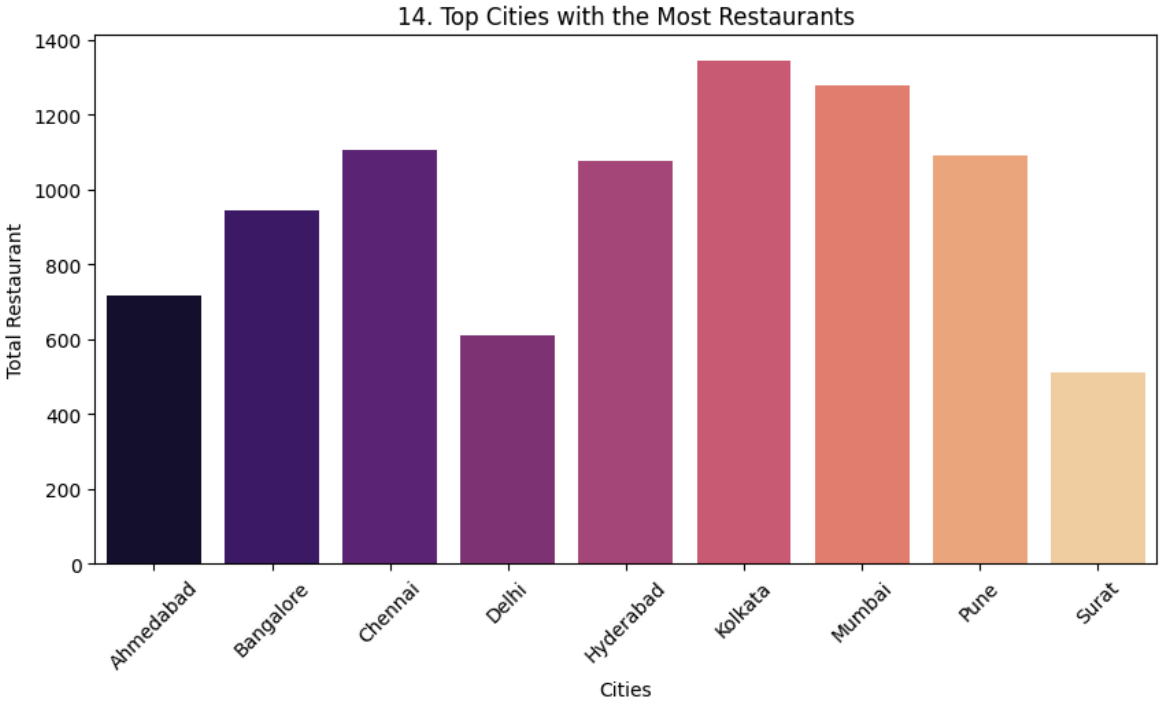
Conclusion:

The average restaurant ratings are fairly stable across cities, with **Chennai and Bangalore leading** in customer satisfaction. However, cities like **Delhi and Pune** may have more room for improvement in terms of food quality and service. 🚀

14. Top 10 Cities with the Most Restaurants - A bar chart showing the number of restaurants per city.

In [ ]:
```
most_rest_city=df.groupby("city")["restaurant"].count()

plt.figure(figsize=(10,5))
sns.barplot(x=most_rest_city.index,y=most_rest_city.values,palette="magma")
plt.title("14. Top Cities with the Most Restaurants")
plt.xticks(rotation=45)
plt.xlabel("Cities")
plt.ylabel("Total Restaurant")
plt.show()
```

```
C:\Users\DAKSH\AppData\Local\Temp\ipykernel_2568\1159140309.py:5: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v
0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effe
ct.

  sns.barplot(x=most_rest_city.index,y=most_rest_city.values,palette="magma")
```



Insights from the Bar Chart - Top Cities with the Most Restaurants

1. **Kolkata Leads** 📈
   - Kolkata has the highest number of restaurants, making it the most restaurant-dense city among the listed ones.
   - This could be due to the city's diverse food culture and high demand for dining options.
2. **Mumbai & Chennai Follow Closely** 🍽️
   - Mumbai and Chennai also have a significant number of restaurants, slightly lower than Kolkata.

- These cities are known for their bustling food scenes, with a mix of traditional and modern cuisine options.

3. **Hyderabad & Pune Have Strong Representation** 🌆
   - Hyderabad and Pune have a competitive number of restaurants, indicating a growing food culture.
   - Hyderabad, famous for its Biryani, and Pune, known for its vibrant cafe culture, contribute to their high restaurant count.
4. **Bangalore & Ahmedabad in the Mid-Range** 🏙️
   - Bangalore has a decent number of restaurants, likely driven by its tech industry and diverse population.
   - Ahmedabad, though a smaller market compared to Mumbai or Kolkata, still maintains a strong restaurant presence.
5. **Delhi Has Fewer Restaurants than Expected** ❓
   - Surprisingly, Delhi has fewer restaurants than many other cities despite being a major food hub in India.
   - This might be due to a larger number of street food vendors not categorized under restaurants.
6. **Surat Has the Lowest Number of Restaurants** 📉
   - Surat has the fewest restaurants among the listed cities, possibly due to a preference for home-cooked food and a less competitive restaurant industry.

15. City-wise Average Price : - A grouped bar chart showing the average Price for restaurants in each city.

In [ ]:
```
city_avg_price=df.groupby("city")["price"].mean()

plt.figure(figsize=(10,5))
sns.barplot(x=city_avg_price.index,y=city_avg_price.values,palette="cubehelix")
plt.title("City Wise Average Price")
plt.xlabel("City")
plt.xticks(rotation=45)
plt.ylabel("Price")
plt.show()
```

```
C:\Users\DAKSH\AppData\Local\Temp\ipykernel_2568\2800883514.py:5: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v
0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effe
ct.

  sns.barplot(x=city_avg_price.index,y=city_avg_price.values,palette="cubehelix")
```

Insights from the City-wise Average Price Chart:

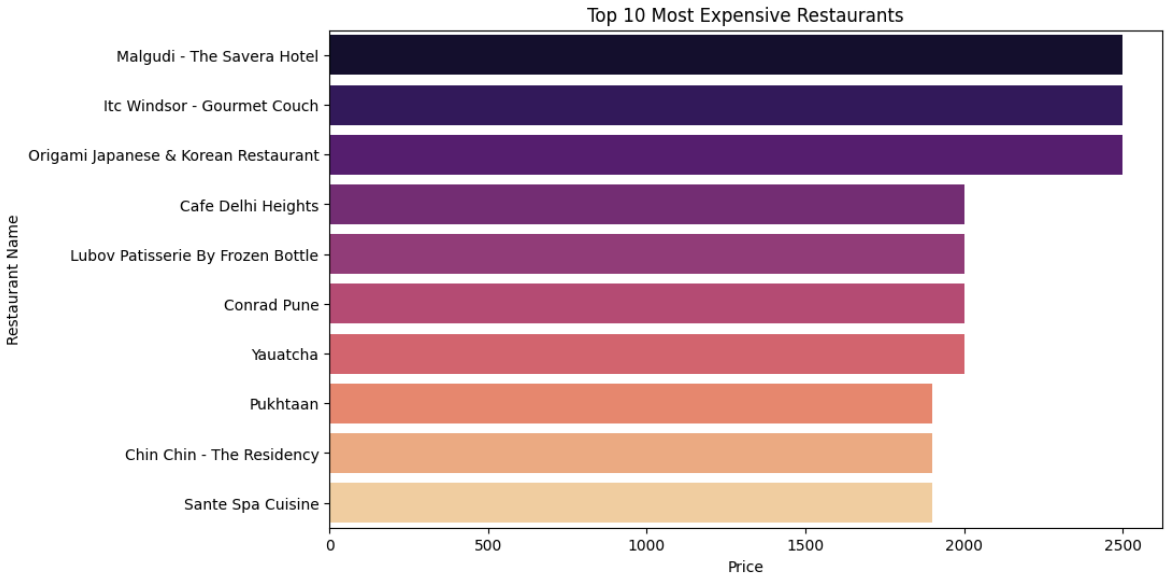
1. **Mumbai has the highest average price**, indicating that dining out in Mumbai is relatively expensive.
2. **Bangalore and Kolkata also have high average prices**, which could be due to higher demand and living costs.
3. **Surat has the lowest average restaurant price**, making it the most affordable city for dining.
4. **Hyderabad and Ahmedabad fall on the lower end of the price spectrum**, suggesting budget-friendly dining options.
5. **Chennai, Delhi, and Pune have moderate prices**, neither too high nor too low.

16. Top 10 Most Expensive Restaurants - A horizontal bar chart showing the top 10 most expensive restaurants.

In [91]:
```
most_expensive_rest=df[["restaurant","price"]].sort_values(by="price",ascending=
print(most_expensive_rest)

plt.figure(figsize=(10, 6))
sns.barplot(x='price', y='restaurant', data=most_expensive_rest, palette='magma'
plt.xlabel("Price")
plt.ylabel("Restaurant Name")
plt.title("Top 10 Most Expensive Restaurants")
plt.show()
```

	restaurant	price
3079	Malgudi - The Savera Hotel	2500
2934	Itc Windsor - Gourmet Couch	2500
4718	Origami Japanese & Korean Restaurant	2500
1377	Cafe Delhi Heights	2000
8485	Lubov Patisserie By Frozen Bottle	2000
2782	Conrad Pune	2000
2757	Yauatcha	2000
2352	Pukhtaan	1900
800	Chin Chin - The Residency	1900
5810	Sante Spa Cuisine	1900

```
C:\Users\DAKSH\AppData\Local\Temp\ipykernel_2568\2787474600.py:5: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v
0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effe
ct.

  sns.barplot(x='price', y='restaurant', data=most_expensive_rest, palette='magm
a')
```



Insights from the Top 10 Most Expensive Restaurants Chart

1. **Malgudi - The Savera Hotel** is the most expensive restaurant, with a price nearing **₹2500**.
2. **ITC Windsor - Gourmet Couch** and **Origami Japanese & Korean Restaurant** also fall in the high-end category, with prices above **₹2000**.
3. **Cafe Delhi Heights** shows a noticeable drop in price compared to the top three but remains in the premium segment.
4. The **price difference between the top and bottom of the list** is significant, with **Sante Spa Cuisine** still being relatively costly but lower than the top-tier restaurants.
5. Restaurants offering **international cuisine or luxury dining experiences** (like Japanese and gourmet hotels) tend to be the most expensive.
6. Cities like **Delhi, Pune, and Bangalore** have multiple entries in the list, indicating a trend of high-end dining options in these locations.