***Importing Libraries***

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

***1.Pandas is used for data manipulation and analysis.2.Numpy is used for numerical Operations.3.Matplotlib.pylot and seaborn are used for data visualization.***

***Create the dataframe***

```
dataframe = pd.read_csv("Zomato data.csv")
print(dataframe.head())
```

```
                  name online_order book_table   rate  votes  \
0                Jalsa          Yes        Yes  4.1/5    775
1        Spice Elephant          Yes         No  4.1/5    787
2       San Churro Cafe          Yes         No  3.8/5    918
3  Addhuri Udupi Bhojana           No         No  3.7/5     88
4          Grand Village           No         No  3.8/5    166

   approx_cost(for two people) listed_in(type)
0                          800          Buffet
1                          800          Buffet
2                          800          Buffet
3                          300          Buffet
4                          600          Buffet
```

```
dataframe
```


```
{"summary":"{\n  \"name\": \"dataframe\",\n  \"rows\": 148,\n
\"fields\": [\n    {\n      \"column\": \"name\",\n
\"properties\": {\n        \"dtype\": \"string\",\n
\"num_unique_values\": 145,\n        \"samples\": [\n          \"The
Biryani Cafe\",\n          \"Melting Melodies\",\n          \"Cuppa\"\
n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"online_order\",\n      \"properties\": {\n        \"dtype\":
\"category\",\n        \"num_unique_values\": 2,\n        \"samples\":
[\n          \"No\",\n          \"Yes\"\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"book_table\",\n
\"properties\": {\n        \"dtype\": \"category\",\n
\"num_unique_values\": 2,\n        \"samples\": [\n          \"No\",\n
\"Yes\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"rate\",\n      \"properties\": {\n        \"dtype\": \"category\",\n
\"num_unique_values\": 20,\n        \"samples\": [\n
\"4.1/5\",\n          \"2.6/5\"\n        ],\n
```

\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"votes\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 653,\n        \"min\": 0,\n        \"max\": 4884,\n        \"num_unique_values\": 90,\n        \"samples\": [\n          244,\n          31\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"approx_cost(for two people)\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 223,\n        \"min\": 100,\n        \"max\": 950,\n        \"num_unique_values\": 18,\n        \"samples\": [\n          800,\n          300\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"listed_in(type)\",\n      \"properties\": {\n        \"dtype\": \"category\",\n        \"num_unique_values\": 4,\n        \"samples\": [\n          \"Cafes\",\n          \"Dining\"\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    }\n  ]\n}","type":"dataframe","variable_name":"dataframe"}

***Data Cleaning***

***Convert the datatype of column Rate to float and remove denominator***

```
#Convert the datatype of column Rate
def handleRate(value):
  value = str(value).split("/")
  value = value[0]
  return float(value)

dataframe["rate"] = dataframe["rate"].apply(handleRate)
print(dataframe.head())
```

```
                  name online_order book_table  rate  votes  \
0                Jalsa          Yes        Yes   4.1    775
1        Spice Elephant          Yes         No   4.1    787
2       San Churro Cafe          Yes         No   3.8    918
3  Addhuri Udupi Bhojana           No         No   3.7     88
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   approx_cost(for two people) listed_in(type)
0                          800          Buffet
1                          800          Buffet
2                          800          Buffet
3                          300          Buffet
4                          600          Buffet
```

```
dataframe.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 148 entries, 0 to 147
Data columns (total 7 columns):
```

```
 #   Column                       Non-Null Count  Dtype  
---  ------                       --------------  -----  
 0   name                         148 non-null    object 
 1   online_order                 148 non-null    object 
 2   book_table                   148 non-null    object 
 3   rate                         148 non-null    float64
 4   votes                        148 non-null    int64  
 5   approx_cost(for two people)  148 non-null    int64  
 6   listed_in(type)              148 non-null    object 
dtypes: float64(1), int64(2), object(4)
memory usage: 8.2+ KB
```

***Summary of the dataframe Conculsion there is no Nul value in dataframe.***

***Q1. What type of restaurant do the majority of customers order from?***

```
#Type of Restaurant
dataframe.head()
```

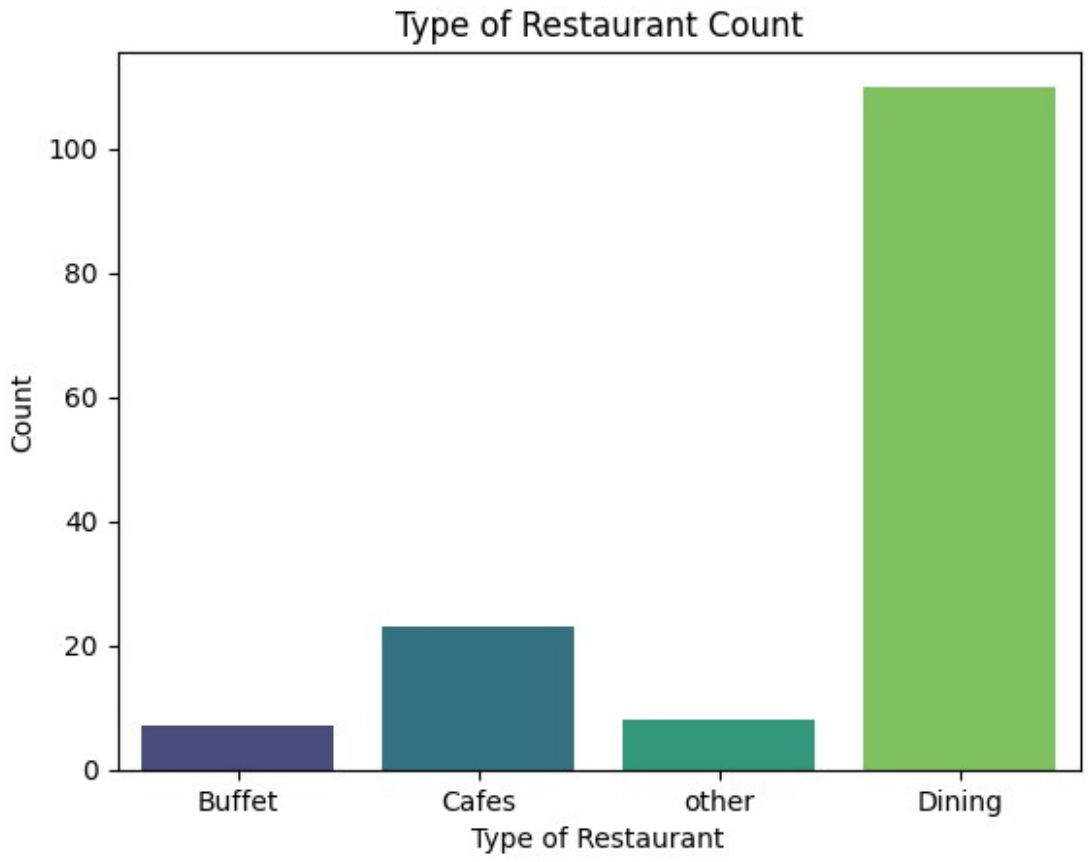

```
{"summary":"{\n  \"name\": \"dataframe\",\n  \"rows\": 148,\n  \"fields\": [\n    {\n      \"column\": \"name\",\n      \"properties\": {\n        \"dtype\": \"string\",\n        \"num_unique_values\": 145,\n        \"samples\": [\n          \"The Biryani Cafe\",\n          \"Melting Melodies\",\n          \"Cuppa\"\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"online_order\",\n      \"properties\": {\n        \"dtype\": \"category\",\n        \"num_unique_values\": 2,\n        \"samples\": [\n          \"No\",\n          \"Yes\"\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"book_table\",\n      \"properties\": {\n        \"dtype\": \"category\",\n        \"num_unique_values\": 2,\n        \"samples\": [\n          \"No\",\n          \"Yes\"\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"rate\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 0.40227051403803343,\n        \"min\": 2.6,\n        \"max\": 4.6,\n        \"num_unique_values\": 19,\n        \"samples\": [\n          4.1,\n          4.0\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"votes\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 653,\n        \"min\": 0,\n        \"max\": 4884,\n        \"num_unique_values\": 90,\n        \"samples\": [\n          244,\n          31\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"approx_cost(for two people)\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 223,\n        \"min\": 100,\n        \"max\": 950,\n        \"num_unique_values\": 18,\n        \"samples\": [\n          800,\n          300\n        ],\n
```

\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"listed_in(type)\",\n
\"properties\": {\n        \"dtype\": \"category\",\n
\"num_unique_values\": 4,\n        \"samples\": [\n
\"Cafes\",\n          \"Dining\"\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    }\n  ]\n}","type":"dataframe","variable_name":"dataframe"}

***Solutions:***

```
sns.countplot(x=dataframe['listed_in(type)'], palette="viridis")
plt.xlabel("Type of Restaurant")
plt.ylabel("Count")
plt.title("Type of Restaurant Count")
plt.show()
```

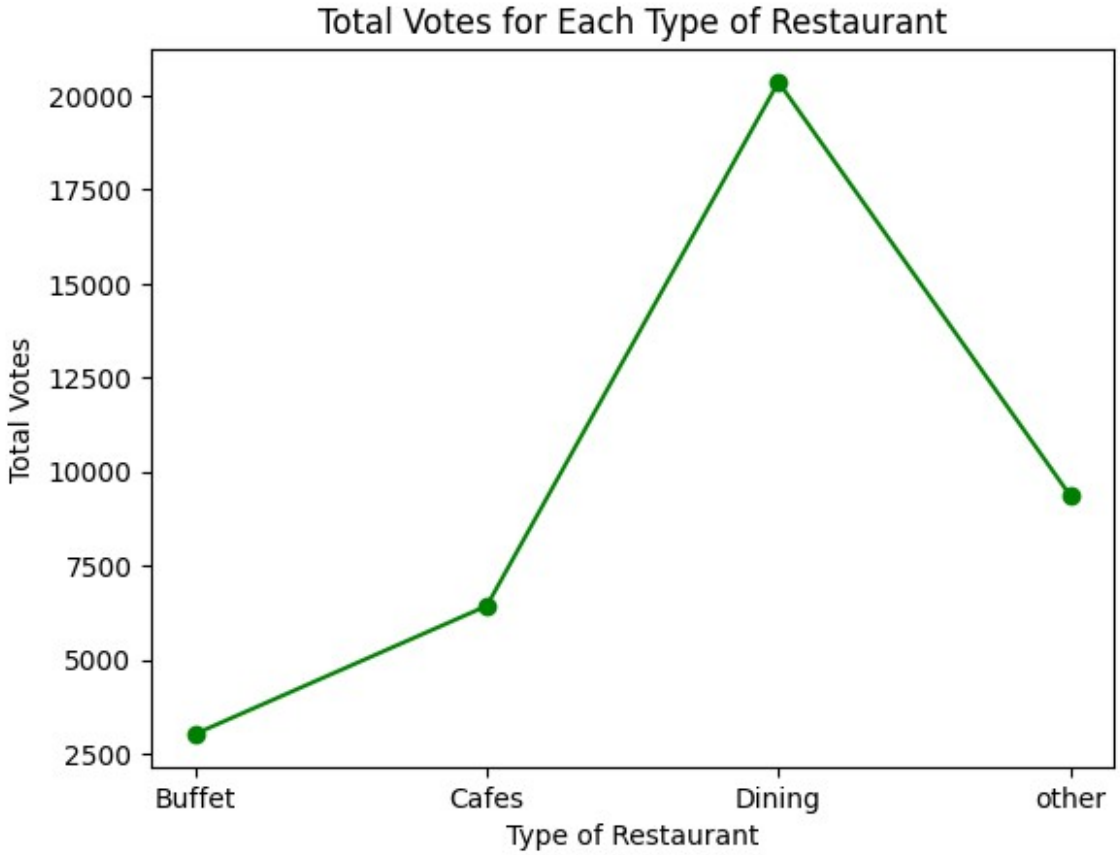
```
<ipython-input-33-05e254a78ed4>:1: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `x` variable to `hue` and set
`legend=False` for the same effect.

  sns.countplot(x=dataframe['listed_in(type)'], palette="viridis")
```



***Conclusion:The majority of the restaurans fall into dining Category. Dining Restaurants are preferred by a larger number of individuals.***

***Q2.How many votes has each type of restaurant received from customers?***

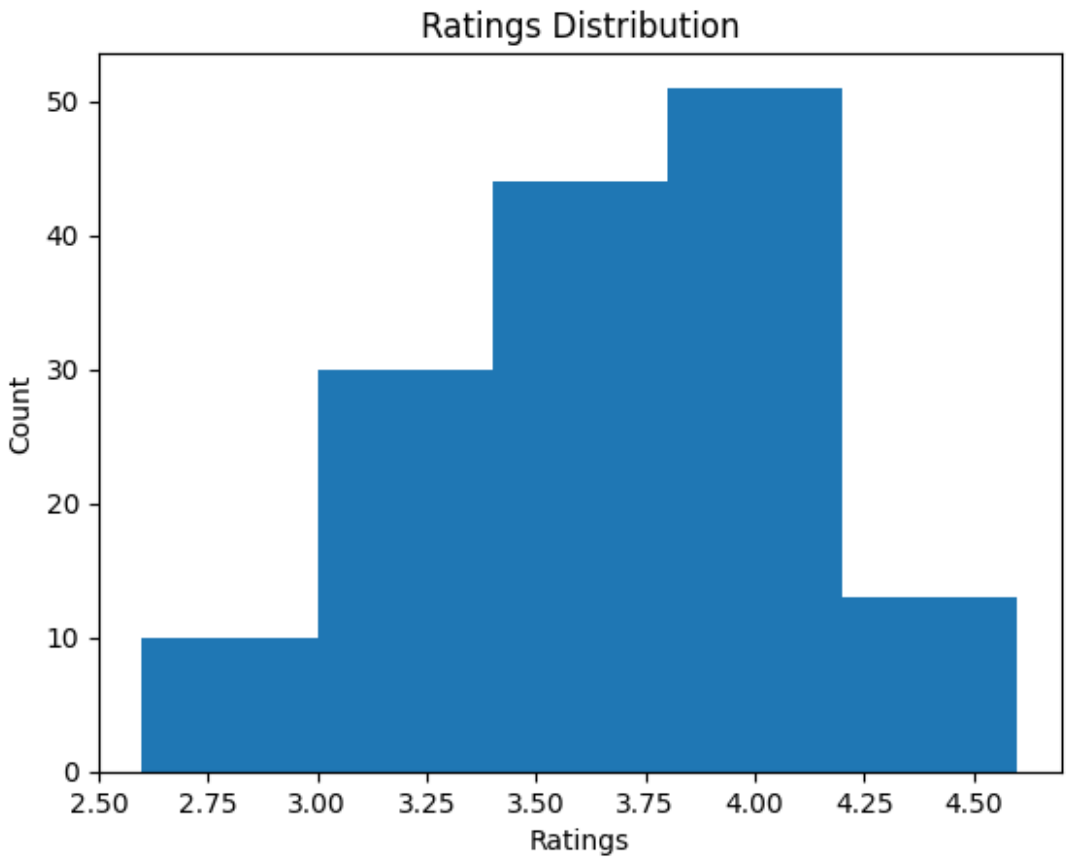
```
grouped_data = dataframe.groupby("listed_in(type)")["votes"].sum()
result = pd.DataFrame({'votes' : grouped_data})
plt.plot(result,c='green',marker='o')
plt.xlabel("Type of Restaurant")
plt.ylabel("Total Votes")
plt.title("Total Votes for Each Type of Restaurant")
plt.show()
```




***Conclusion: Dining Restaurant has Maxing Votes.***

***Q3. What are the ratings that the majority of restaurants have received?***

```
plt.hist(dataframe["rate"],bins=5)
plt.xlabel("Ratings")
plt.ylabel("Count")
plt.title("Ratings Distribution")
plt.show()
```

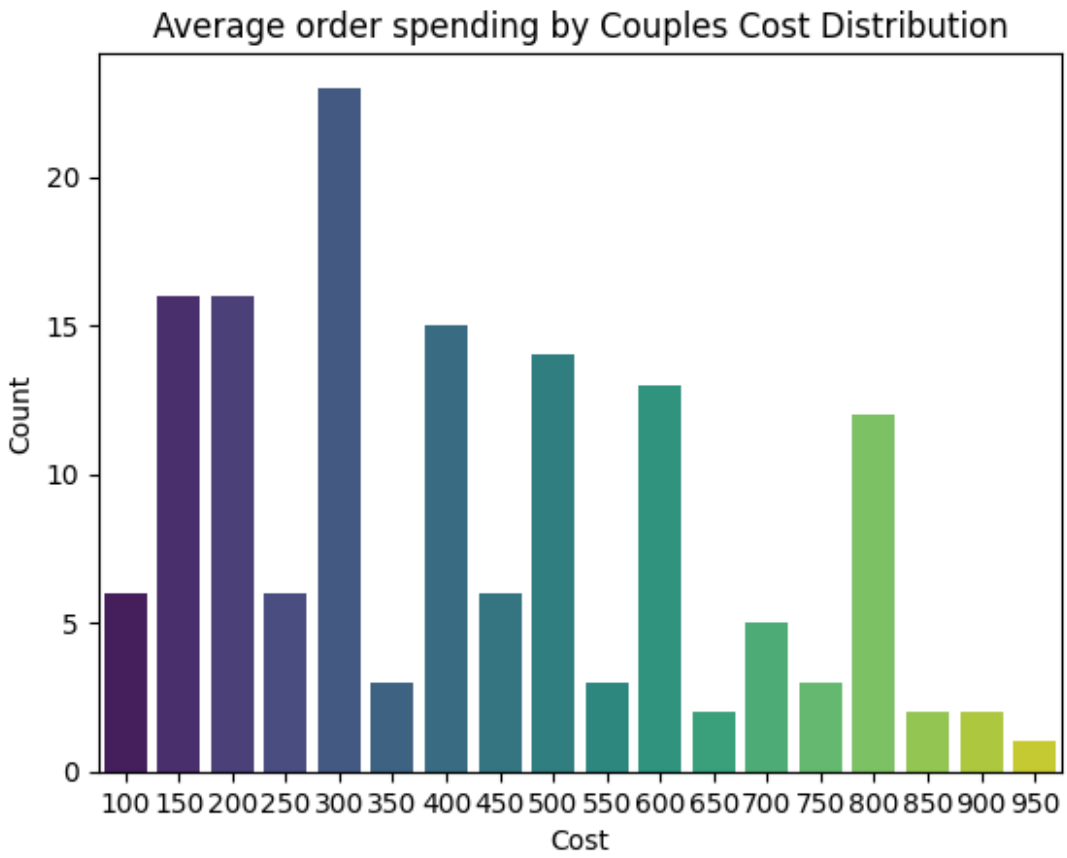



***Conclusion:The majority of restaurants received ratings ranging from 3.5 to 4.The Majority of couples prefer restaurants with approximate cost of 300 rupees.***

***Q4. Zomato has observed that most couples order most of their food online.What is the averrage spending on each order?***

```
#Average order spending by couples
couple_data = dataframe['approx_cost(for two people)']
sns.countplot(x=couple_data, palette="viridis")
plt.xlabel("Cost")
plt.ylabel("Count")
plt.title("Average order spending by Couples Cost Distribution")
plt.show()
```

```
<ipython-input-39-3d1a711b087c>:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `x` variable to `hue` and set
`legend=False` for the same effect.

  sns.countplot(x=couple_data, palette="viridis")
```

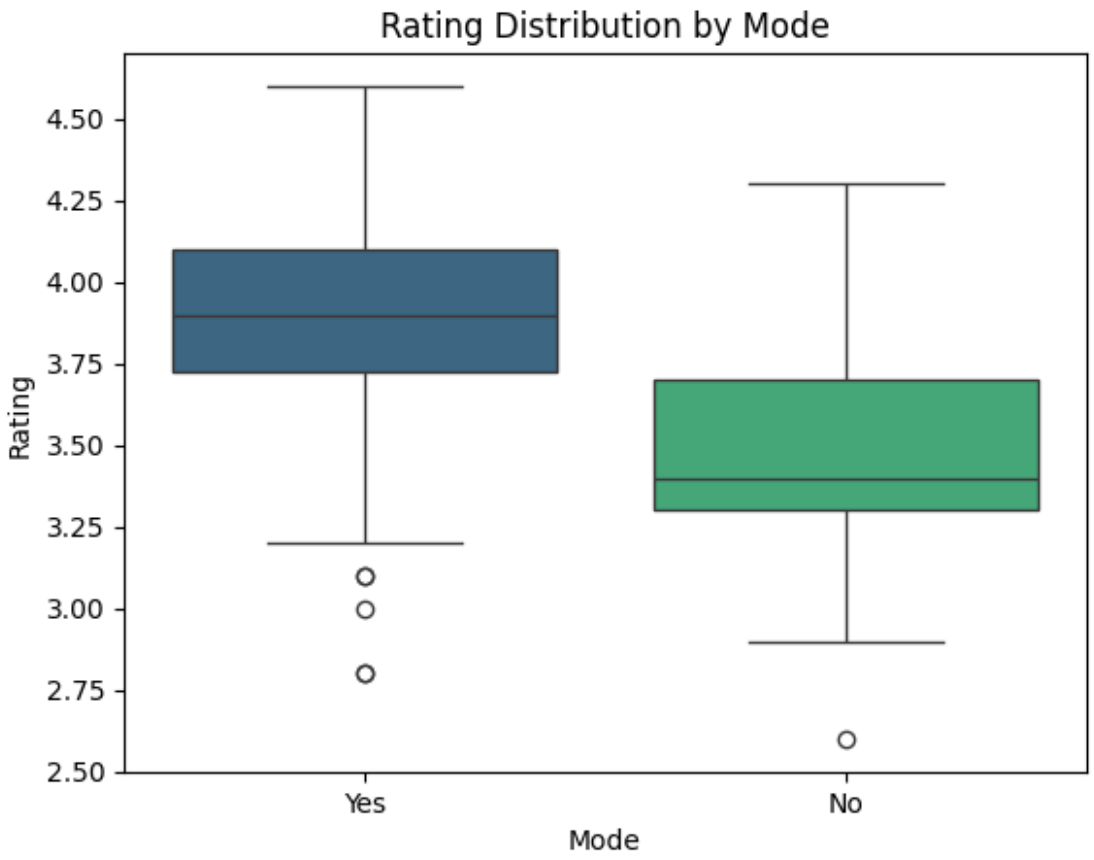



***Conclusion: The majority of couples prefer resturants with an approximate cost of 300 rupees***

***Q5.Which mode (online or offline) has received the maximum rating?***

```
plt.figure()
sns.boxplot(x=dataframe['online_order'], y=dataframe['rate'],
palette="viridis")
plt.xlabel("Mode")
plt.ylabel("Rating")
plt.title("Rating Distribution by Mode")
plt.show()
```

```
<ipython-input-43-6d3b730d79dd>:2: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `x` variable to `hue` and set
`legend=False` for the same effect.

  sns.boxplot(x=dataframe['online_order'], y=dataframe['rate'],
palette="viridis")
```




***Conclusion: Offline orders received lower ratings in comparison to online orders, which obtained excellent ratings.***

***Q6.Which type of restaurant received more offline orders.so that Zomato can provide customer with some good offers?***

```
pivot_table = dataframe.pivot_table(index='listed_in(type)',
columns='online_order', aggfunc='size', fill_value=0)
sns.heatmap(pivot_table,annot=True,cmap="viridis", fmt='d')
plt.xlabel("Online Order")
plt.ylabel("Type of Restaurant")
plt.title("Offline Orders by Type of Restaurant")
plt.show()
```


***Conclusion:Dining restaurants primarily accept offline orders,whereas cafes primarily receive online orders.This suggests that clients prefer to place orders in person at restaurants, but prefer online ordering at cafes.***