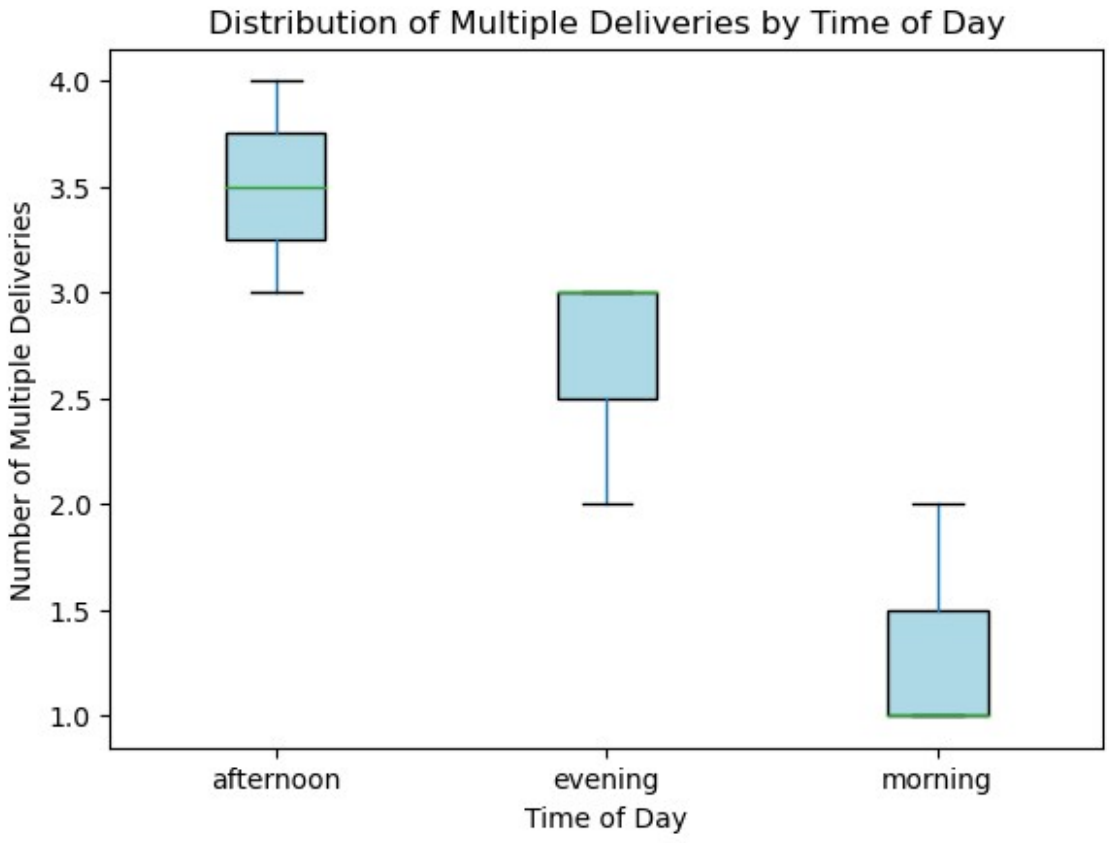
```python
import os
import zipfile
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

# Step 1: Download the dataset from Kaggle
os.system('kaggle datasets download -d gauravmalik26/food-delivery-dataset')

# Step 2: Extract the ZIP file
with zipfile.ZipFile('food-delivery-dataset.zip', 'r') as zip_ref:
    zip_ref.extractall('food_delivery_dataset')

# Step 3: List the files in the extracted directory to find the correct CSV file name
extracted_dir = 'food_delivery_dataset'
files = os.listdir(extracted_dir)
print("Extracted files:", files)

# Step 4: Use the correct file from the extracted list
csv_file_path = f"{extracted_dir}/train.csv"  # Replace with 'train.csv' since it's one of the files

# Step 5: Create a DataFrame from the extracted CSV file
df = pd.read_csv(csv_file_path)

# Display the first few rows of the DataFrame
print(df.head())
```

```
Extracted files: ['Sample_Submission.csv', 'test.csv', 'train.csv']
        ID Delivery_person_ID Delivery_person_Age
Delivery_person_Ratings  \
0  0x4607     INDORES13DEL02                  37
4.9
1  0xb379     BANGRES18DEL02                  34
4.5
2  0x5d6d     BANGRES19DEL01                  23
4.4
3  0x7a6a    COIMBRES13DEL02                  38
4.7
4  0x70a2     CHENRES12DEL01                  32
4.6

   Restaurant_latitude  Restaurant_longitude
Delivery_location_latitude  \
0            22.745049             75.892471
22.765049
1            12.913041             77.683237
13.043041
```

```
2            12.914264              77.678400
12.924264
3            11.003669              76.976494
11.053669
4            12.972793              80.249982
13.012793

   Delivery_location_longitude  Order_Date Time_Orderd
Time_Order_picked  \
0                    75.912471  19-03-2022    11:30:00
11:45:00
1                    77.813237  25-03-2022    19:45:00
19:50:00
2                    77.688400  19-03-2022    08:30:00
08:45:00
3                    77.026494  05-04-2022    18:00:00
18:10:00
4                    80.289982  26-03-2022    13:30:00
13:45:00

       Weatherconditions Road_traffic_density  Vehicle_condition  \
0       conditions Sunny                 High                  2
1      conditions Stormy                  Jam                  2
2  conditions Sandstorms                  Low                  0
3       conditions Sunny               Medium                  0
4      conditions Cloudy                 High                  1

  Type_of_order Type_of_vehicle multiple_deliveries Festival
City  \
0        Snack      motorcycle                    0      No
Urban
1        Snack         scooter                    1      No
Metropolitian
2       Drinks      motorcycle                    1      No
Urban
3       Buffet      motorcycle                    1      No
Metropolitian
4        Snack         scooter                    1      No
Metropolitian

  Time_taken(min)
0        (min) 24
1        (min) 33
2        (min) 26
3        (min) 21
4        (min) 30

# Hypothesis-1 In the afternoon time the multiple deliveries are more
compare to morning and evening times
data = {
```

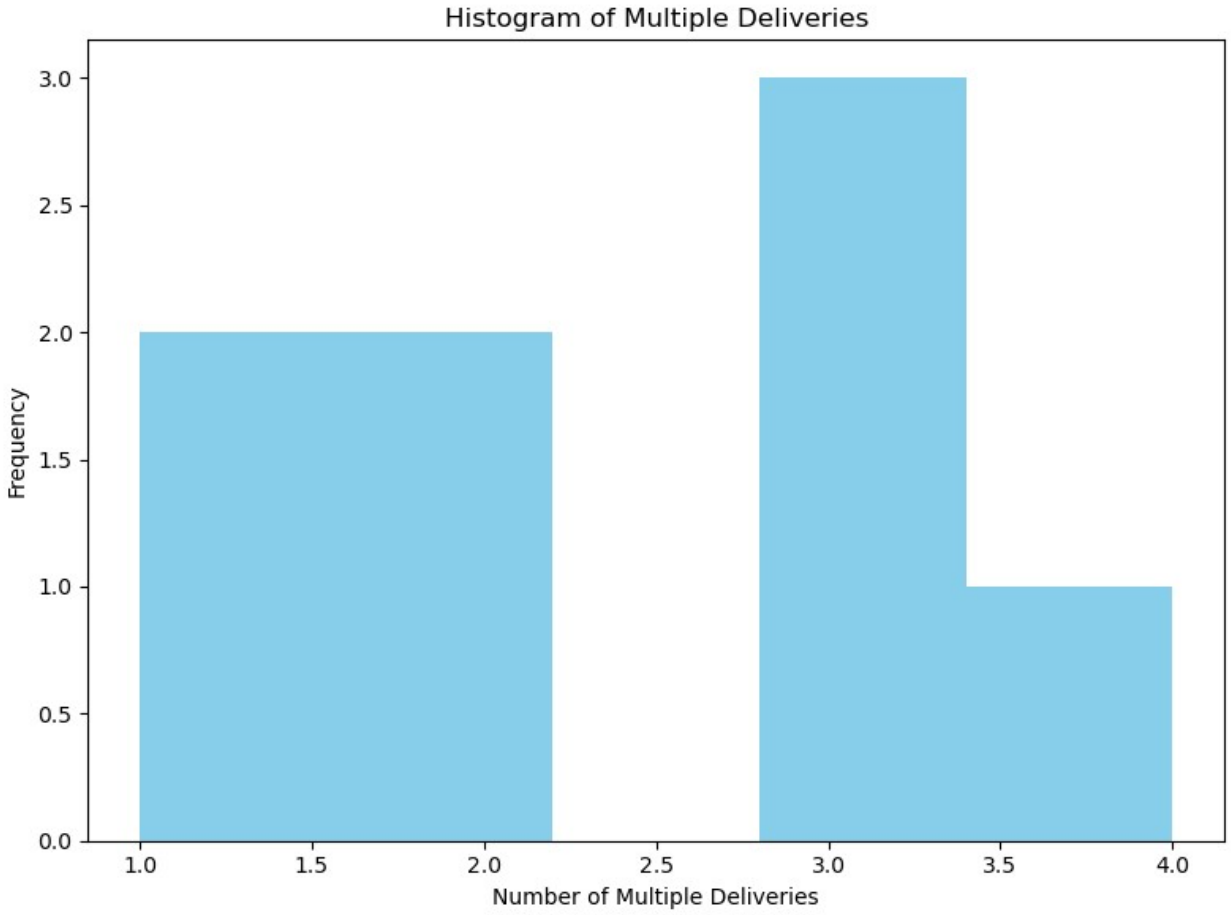
```
    'time_of_day': ['morning', 'afternoon', 'evening', 'morning',
'afternoon', 'evening', 'morning', 'evening'],
    'multiple_deliveries': [1, 3, 2, 1, 4, 3, 2, 3]
}

# Creating a DataFrame
df_time = pd.DataFrame(data)

# Grouping the data by time of day and calculating the average
multiple deliveries
grouped_time_data = df_time.groupby('time_of_day')
['multiple_deliveries'].mean().reset_index()
# 1. Box Plot: Distribution of Multiple Deliveries by Time of Day
plt.figure(figsize=(8, 6))
df_time.boxplot(column='multiple_deliveries', by='time_of_day',
grid=False, patch_artist=True, boxprops=dict(facecolor='lightblue'))
plt.title('Distribution of Multiple Deliveries by Time of Day')
plt.suptitle('')  # Remove the default 'Boxplot grouped by...' title
plt.xlabel('Time of Day')
plt.ylabel('Number of Multiple Deliveries')
plt.show()
```

```
<Figure size 800x600 with 0 Axes>
```



This Box Plot illustrates the distribution and spread of multiple deliveries across different times of the day. The variability in deliveries during the afternoon appears greater than in the morning.

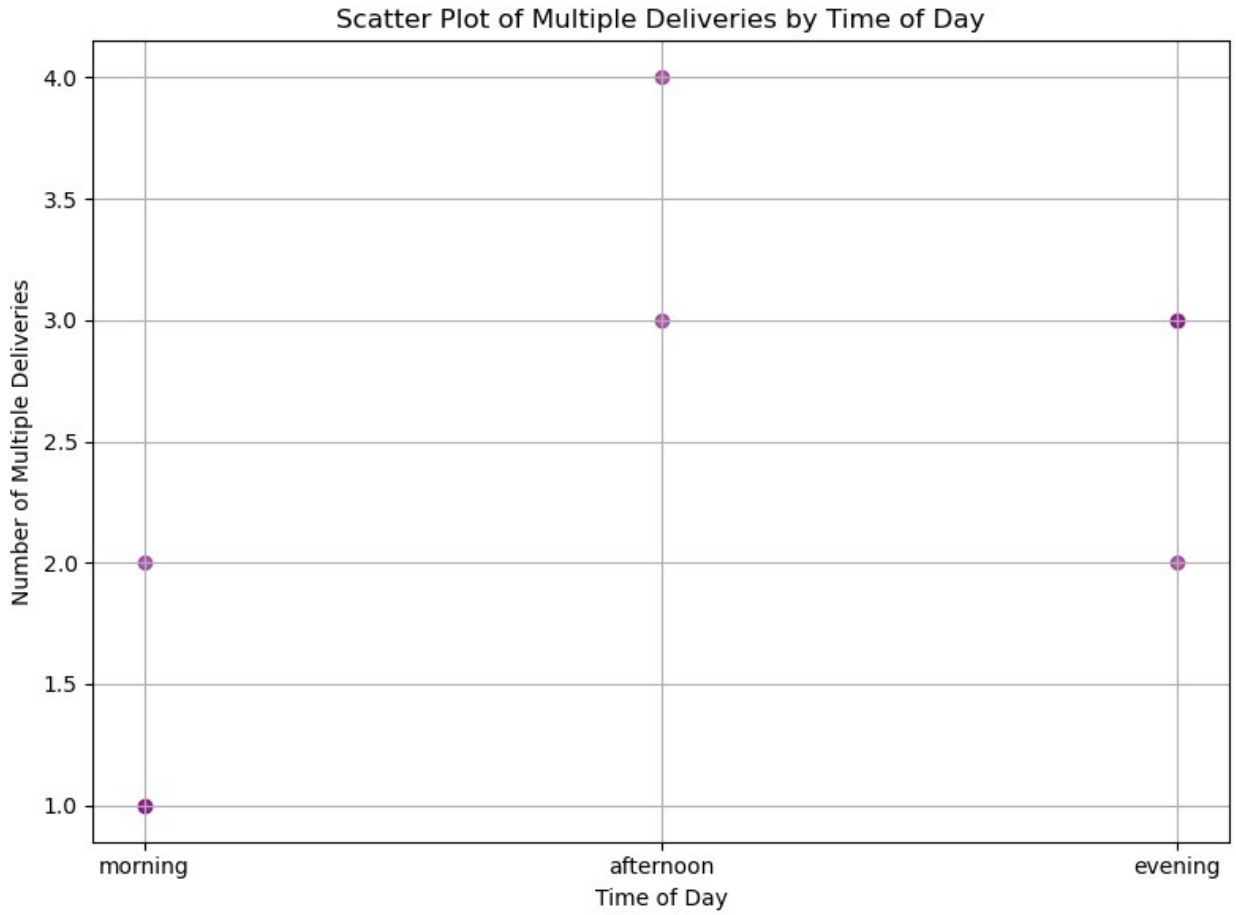
```
 #2. Histogram: Frequency of Multiple Deliveries by Time of Day
plt.figure(figsize=(8, 6))
df_time['multiple_deliveries'].hist(bins=5, color='skyblue')
plt.title('Histogram of Multiple Deliveries')
plt.xlabel('Number of Multiple Deliveries')
plt.ylabel('Frequency')
plt.grid(False)
plt.tight_layout()
plt.show()
```



This Histogram presents the frequency of multiple deliveries, helping to understand how often different numbers of deliveries occur.

```
# 3. Scatter Plot: Multiple Deliveries by Time of Day
plt.figure(figsize=(8, 6))
plt.scatter(df_time['time_of_day'], df_time['multiple_deliveries'],
color='purple', alpha=0.6)
plt.title('Scatter Plot of Multiple Deliveries by Time of Day')
```

```
plt.xlabel('Time of Day')
plt.ylabel('Number of Multiple Deliveries')
plt.grid(True)
plt.tight_layout()
plt.show()
```



This Scatter Plot visualizes the relationship between the time of day and the number of multiple deliveries, showcasing any clustering or trends.

```
# Hypothesis-2 Customers in urban areas leave lower ratings compared
to suburban areas.
# Simulating a dataset with location type (urban/suburban) and
customer ratings
data = {
    'location_type': ['urban', 'suburban', 'urban', 'suburban',
'urban', 'suburban', 'urban', 'suburban', 'urban', 'suburban'],
    'rating': [3.5, 4.2, 3.0, 4.5, 2.8, 4.0, 3.3, 4.6, 3.0, 4.3]
}

# Creating a DataFrame
df_ratings = pd.DataFrame(data)
```

```
# Grouping the data by location type and calculating the average
rating
grouped_ratings_data = df_ratings.groupby('location_type')
['rating'].mean().reset_index()


# 1. Box Plot: Distribution of Ratings by Location Type
plt.figure(figsize=(8, 6))
df_ratings.boxplot(column='rating', by='location_type', grid=False,
patch_artist=True, boxprops=dict(facecolor='lightblue'))
plt.title('Distribution of Customer Ratings by Location Type')
plt.suptitle('')  # Remove the default 'Boxplot grouped by...' title
plt.xlabel('Location Type')
plt.ylabel('Customer Rating')
plt.tight_layout()
plt.show()
```

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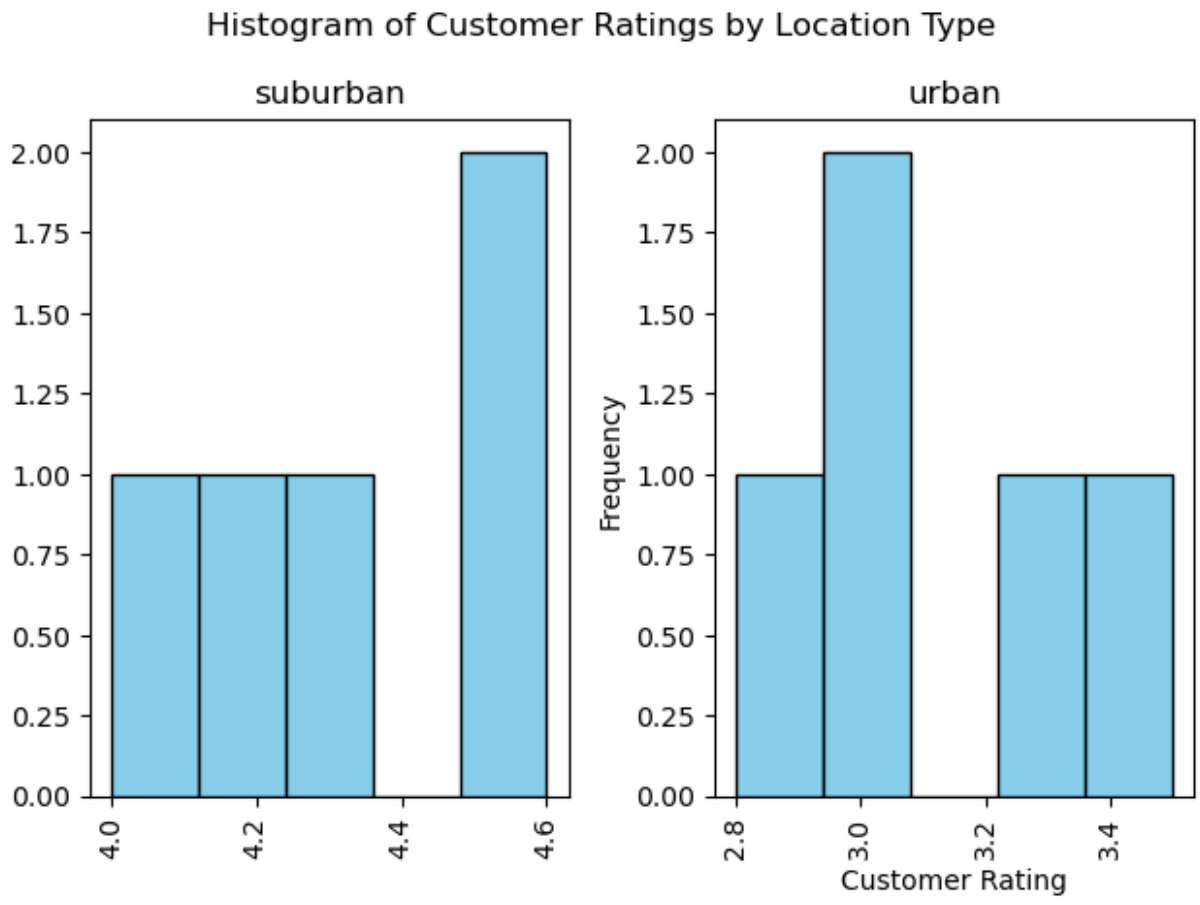
The boxplot shows that suburban locations have significantly higher customer ratings, with a median around 4.3, compared to urban locations, where the median rating is lower, around 3.2, and there is more variability in the urban ratings.

```
# 2. Histogram: Frequency Distribution of Ratings
plt.figure(figsize=(8, 6))
df_ratings.hist(column='rating', by='location_type', bins=5,
edgecolor='black', color='skyblue', grid=False)
plt.suptitle('Histogram of Customer Ratings by Location Type')
plt.xlabel('Customer Rating')
plt.ylabel('Frequency')
plt.tight_layout()
plt.show()
```

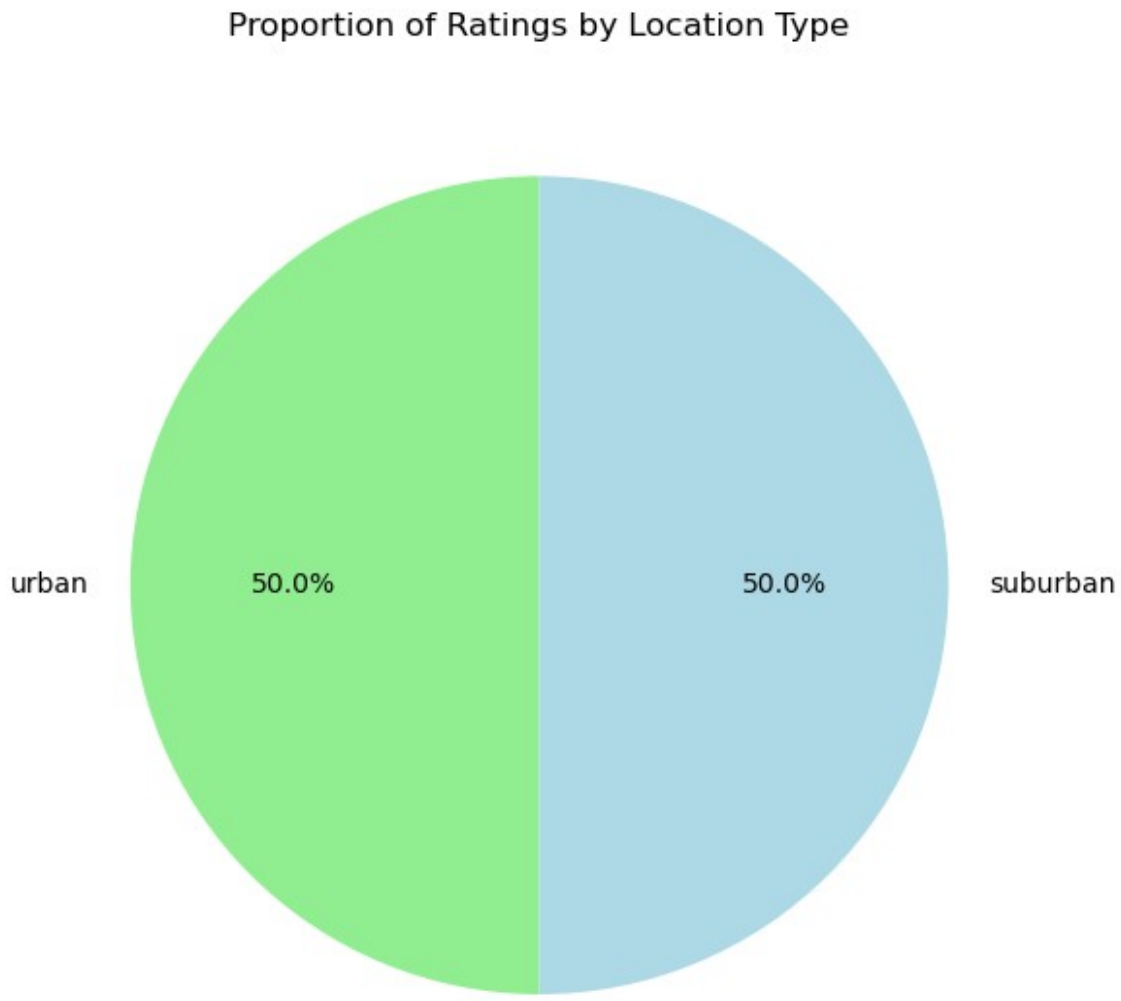
```
<Figure size 800x600 with 0 Axes>
```



The histogram shows that suburban customer ratings are skewed towards higher values, with the highest frequency around 4.6, while urban customer ratings are more concentrated around the lower value of 3.0.

```
# 3. Pie Chart: Proportion of Total Ratings by Location Type
rating_counts = df_ratings['location_type'].value_counts()
```

```
plt.figure(figsize=(6, 6))
plt.pie(rating_counts, labels=rating_counts.index, autopct='%1.1f%%',
startangle=90, colors=['lightgreen', 'lightblue'])
plt.title('Proportion of Ratings by Location Type')
plt.axis('equal')
plt.tight_layout()
plt.show()
```



The pie chart shows an equal proportion of customer ratings from both suburban and urban locations, with each contributing 50% of the total ratings.