Automated Data Analysis Report

Generated by: LangGraph Multi-Agent System
Modules: Data Parser, Insight Generator, Visualization Agent

■ Dataset Summary

Total Rows: 244
Total Columns: 7

Columns: total_bill, tip, sex, smoker, day, time, size

■ Insights & Analysis

Key Insights and Trends:

1. **High Correlation between Total Bill and Tip**: The correlation between total bill and tip is strong (0.6757), indicating that there is a significant relationship between the amount spent and the tip left. This suggests that customers tend to leave higher tips when they spend more on food.
2. **Moderate Correlation between Total Bill and Size of Party**: The correlation between total bill and size of party is also moderate (0.5983), indicating that larger parties tend to spend more on food. However, this correlation is lower than the correlation between total bill and tip, suggesting that the size of party is not the primary driver of total bill.
3. **Moderate Correlation between Tip and Size of Party**: The correlation between tip and size of party is moderate (0.4893), indicating that larger parties tend to leave higher tips, but this relationship is not as strong as the relationship between total bill and tip.
4. **No Missing Values**: The missing percentage is zero for all columns, indicating that the dataset is complete and there are no missing values.
5. **Summary Statistics**: The mean, standard deviation, and other summary statistics for total bill, tip, and size of party are presented. Notably, the standard deviation for tip is higher than the standard deviation for total bill, suggesting that tips are more variable than total bills.

Interesting Patterns:

* The mean tip is approximately 3%, which is relatively high compared to the US average. This may indicate that customers in this restaurant tend to be generous with their tips.
* The maximum tip is $10, which is relatively high compared to the US average.
* The size of party has a skewness towards smaller parties (around 2-3 people), with fewer larger parties (6 people or more).

Potential Areas of Investigation:

1. **Analyze the relationship between total bill, tip, and size of party in more detail**. For example, how do larger parties allocate their tips compared to smaller parties?
2. **Investigate the reasons behind the high mean tip**. Is this due to a high-income demographic, excellent customer service, or other factors?
3. **Explore the distribution of tips and total bills**. For example, are there any outliers or anomalies in the data that may warrant further investigation?
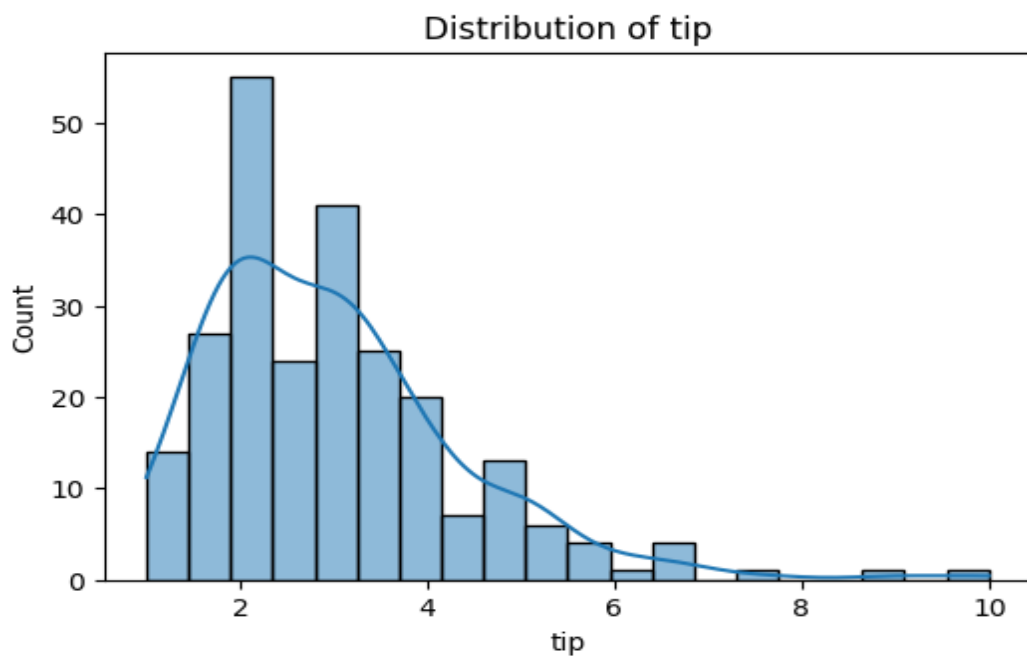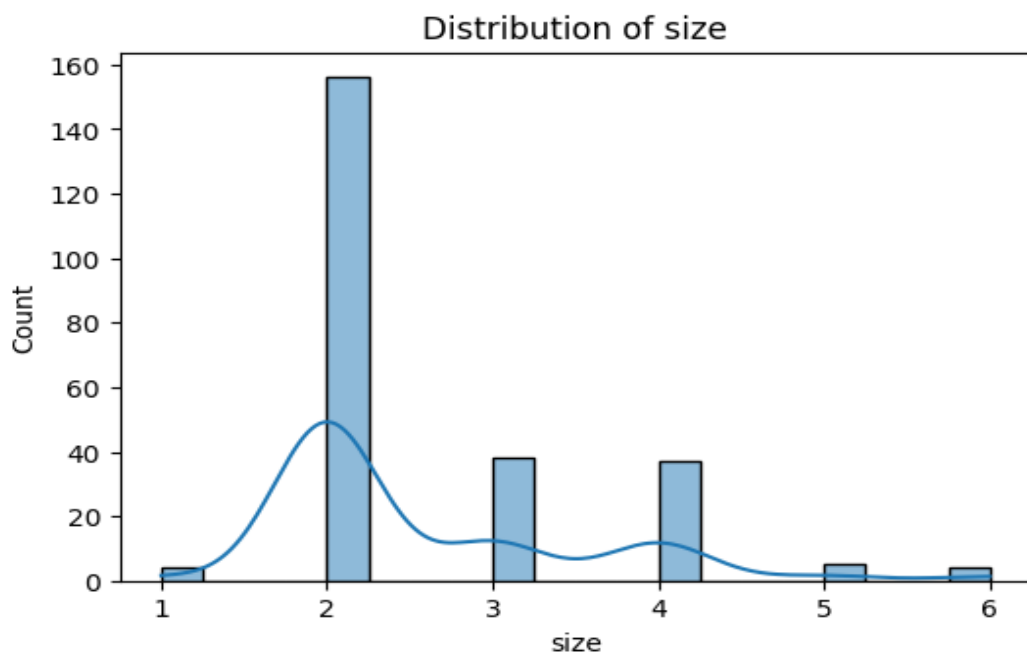
■ Visualizations
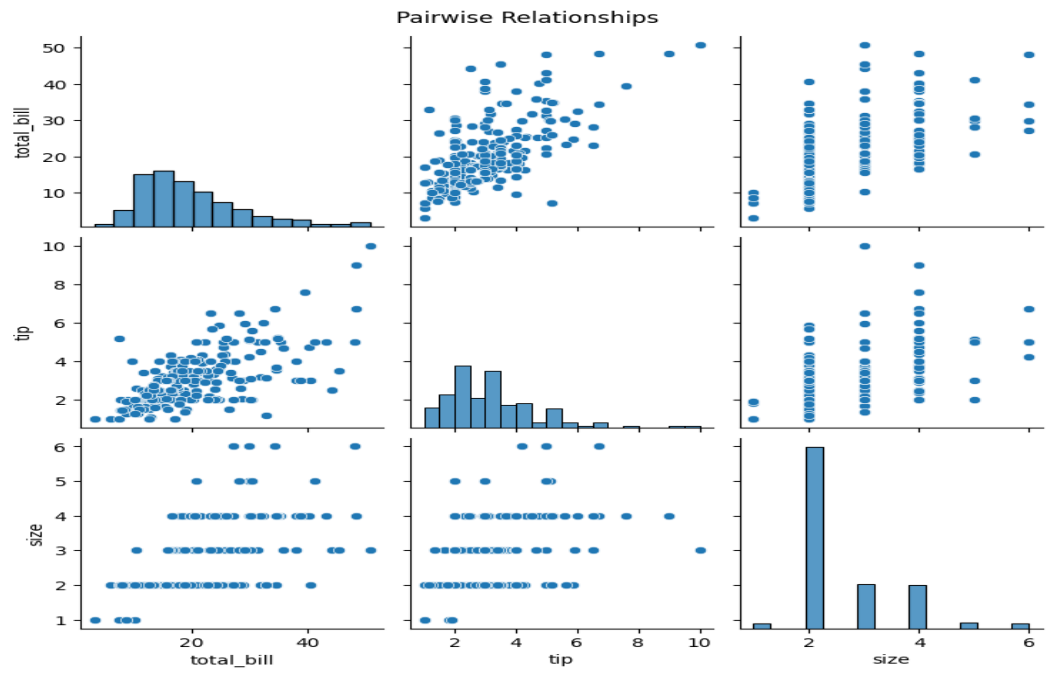
Correlation Heatmap
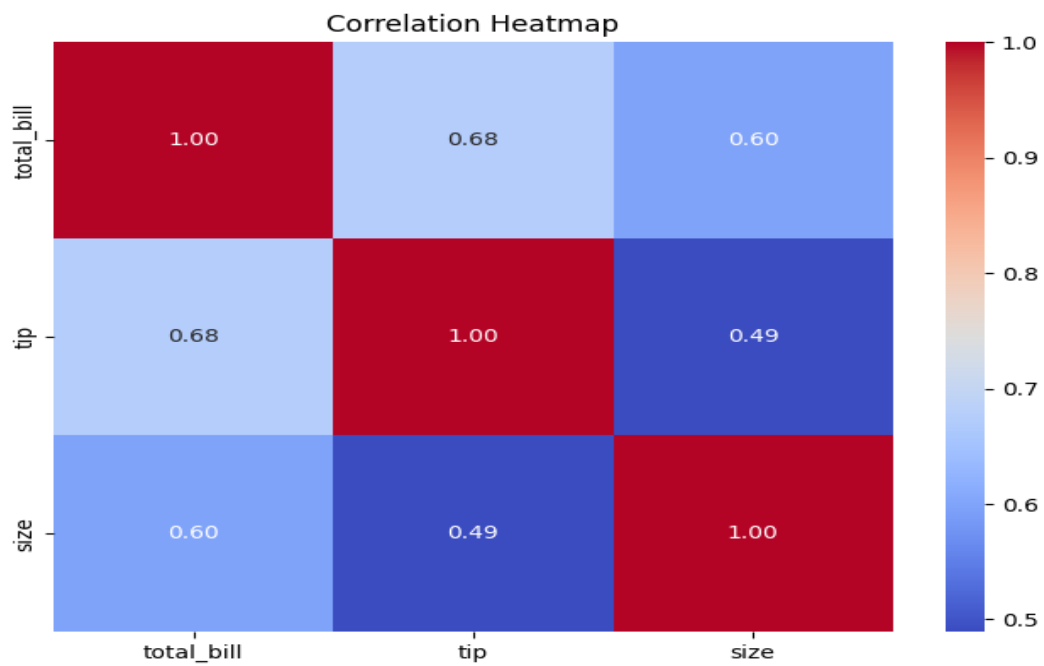
Total Bill Distribution

Tip Distribution

Distribution of tip

Size Distribution

Distribution of size

Pairplot

Pairwise Relationships
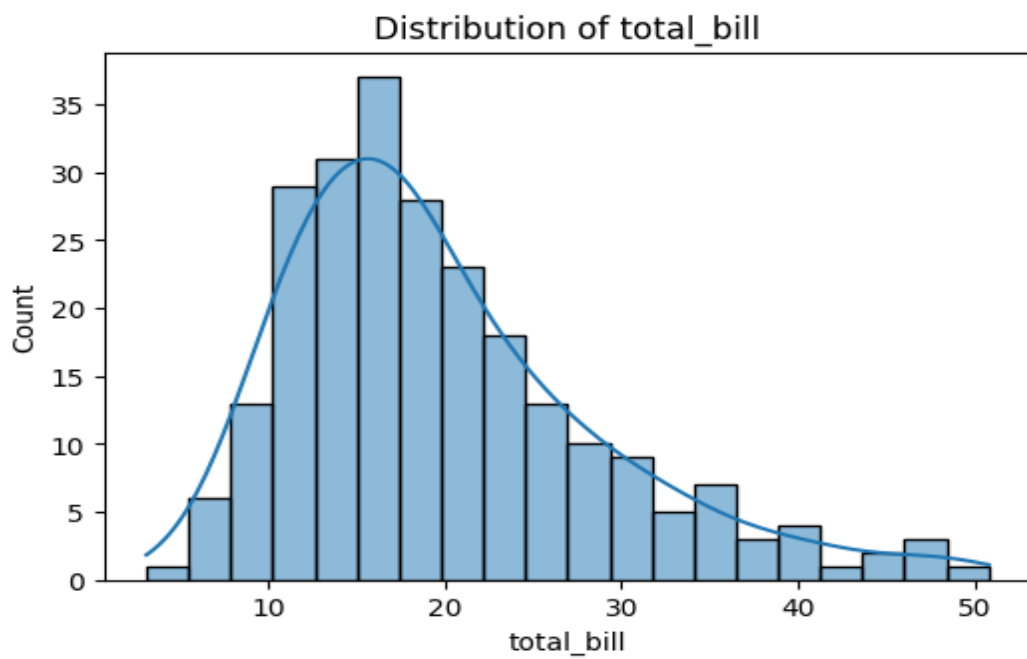
■ Report Summary

This report was automatically generated by a LangGraph-powered multi-agent pipeline. It includes insights derived from data parsing, LLM reasoning, and statistical visualization.