RESTAURANT DATA REPORT

This dataset represents restaurant bill transactions, focusing on several key attributes related to pelanggan behavior and the service provided. The columns in the dataset are as follows:

1. Total Bill: The total amount of the bill for the meal.
2. Tip: The amount of the tip given by the pelanggan.
3. Sex: The gender of the pelanggan (Male/Female).
4. Smoker: Indicates whether the pelanggan was a smoker (Yes/No).
5. Day: The day of the week the transaction took place (e.g., Sun, Sat).
6. Time: Whether the meal was during lunch or dinner (Dinner).
7. Size: The number of people at the table.

The dataset seems to include records of multiple transactions from a restaurant, where for each transaction, data on the total bill, tip, gender of the pelanggan, smoking status, day, time of day, and party size are recorded. This data can be used for analyzing tipping patterns based on gender, smoking habits, day of the week, or group size. Additionally, correlations between total bill and tip can be explored.

Let's dive into the information from this data.
we can find out which day of the week the restaurant receives more bills or transactions from customers. Each bill is recorded along with the day the transaction occurred, so to determine which day has the most transactions, we can count the frequency of each day's occurrence.

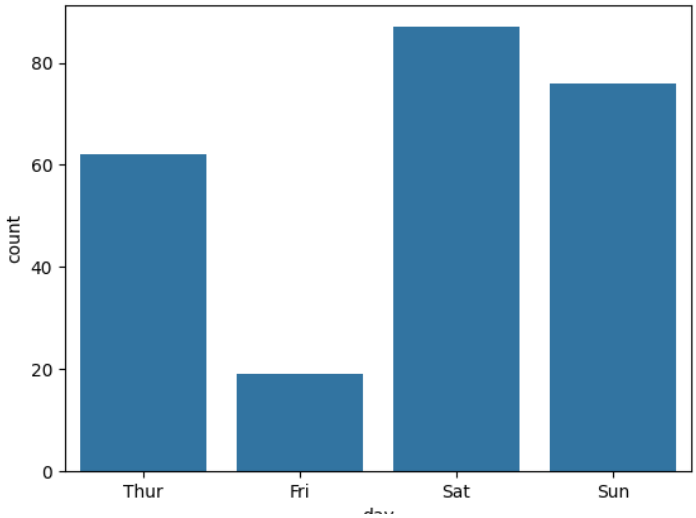

Figure 1 Frequency of day occurrences to determine the number of transactions

From the graph above, it is clear that Saturday has the most transactions compared to the other days, followed by Sunday, Thursday, and Friday.

From this, we can infer that the restaurant is typically busier on Saturdays than on other days. We can even go further by adding other categories such as sex, smoker, and time.

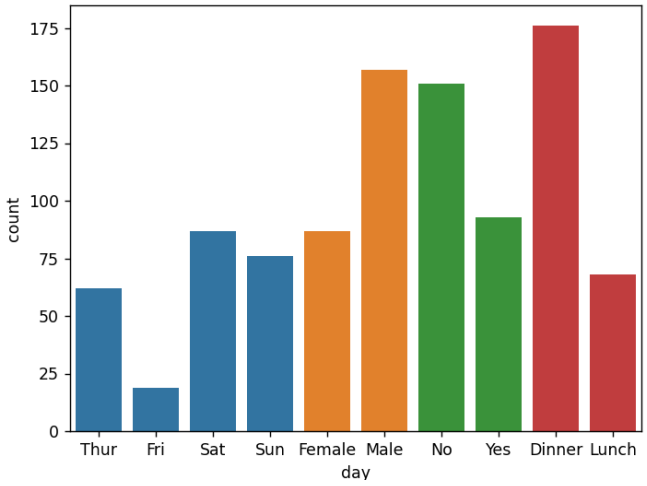

Figure 2 Advanced graph for deeper insights

What do we find? The information we gather becomes more detailed as we consider customer habits at the restaurant, such as :

1. The restaurant has more male customers than female.
2. There are more non-smoking customers than smoking customers.
3. The restaurant is busier during dinner than lunch hours.

Therefore, based on this brief analysis, we can conclude that weekends tend to be busier, likely related to family or social dinners. The majority of customers are male and non-smokers, possibly indicating that this group consists mostly of non-smoking employees.

we can extract information about the distribution of data. Let's start by categorizing the data by day and analyze the total bill distribution.

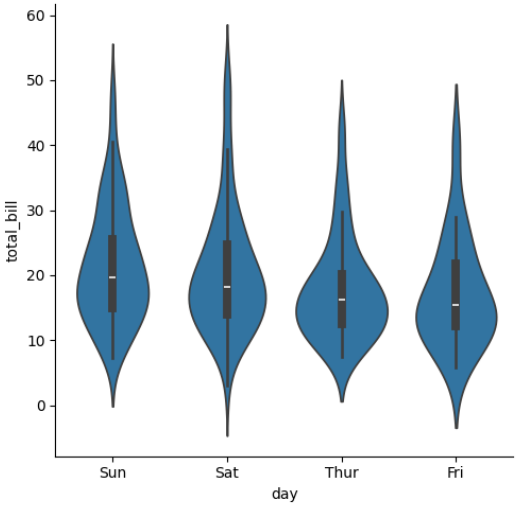

Figure 3 Distribution of Total Bill based on Day

From the diagram in Figure 3, several observations can be made:

1. Sunday, The total bill tends to be higher compared to other days, with more variation in bill amounts.
2. Saturday, The bill distribution shows a wider peak, indicating that many customers spent within a certain range.
3. Thursday and Friday, The distribution is narrower compared to Sunday and Saturday, suggesting that customers may spend less on these days than on weekends.

Based on this brief analysis, we can conclude that customers prefer to spend more money at the restaurant on weekends, particularly on Sundays. This could be related to family dining habits or increased social activities over the weekend. Meanwhile, Thursday shows a more homogeneous spending pattern, with customers spending similar amounts.

Now, let's examine the tip distribution by looking at the relationship between day and tip amounts, as shown in the graph below.

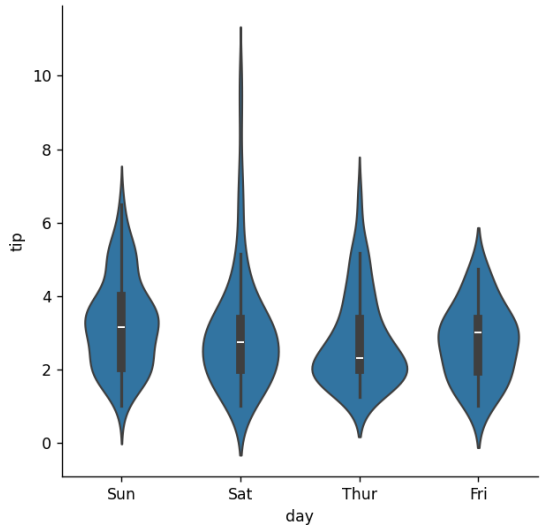

Figure 4 Distribution of Tip based on Day

From the graph above, we can note several key points by day :

1. Sunday, Tips tend to be higher, as indicated by the data spread from Q3 to Q4.
2. Saturday, The highest tip exceeds $10, but the distribution shows that this tip was likely given by a specific customer.
3. Thursday, The data is densely spread from Q1 to Q3, especially around Q2, indicating that many customers tipped between $1 and $3. However, a small group of customers tipped around $8.
4. Friday, Although the highest tip is lower than the others, Friday has a more even distribution of tips from Q1 to Q3.

Based on this brief analysis, we can conclude that customers tend to tip higher on weekends, especially on Sunday. This may also be because more customers prefer to dine at the restaurant on weekends for dinners with family or friends. On Thursday, customers tend to tip lower, which might be because it is not the last workday of the week like Friday, which has a better tip distribution than Thursday.

We have now analyzed total bills and tips by day, so how about we explore the relationship between total bill and tip through the two graphs below?

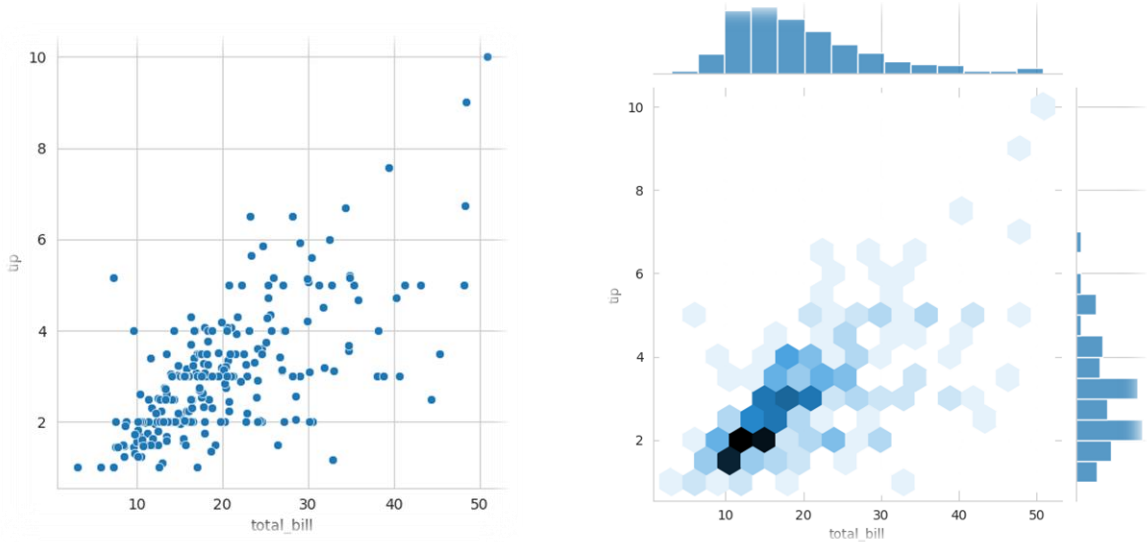

Figure 5 Relationship between Total Bill and Tip

In the two graphs above, there is a clear positive correlation between total bill and tip. The data distribution is most common in the average total bill range of $10–$20, with tips between $1.5–$4, providing insight that most restaurant customers spend within this total bill range and give tips in the $1.5–$4 range.

Now, let's examine the variables smoker and time based on total bill. What insights can we gather? Below is a graph showing the relationship between these three variables.

Smokers during dinner show the highest average total bill, exceeding $50, with a more

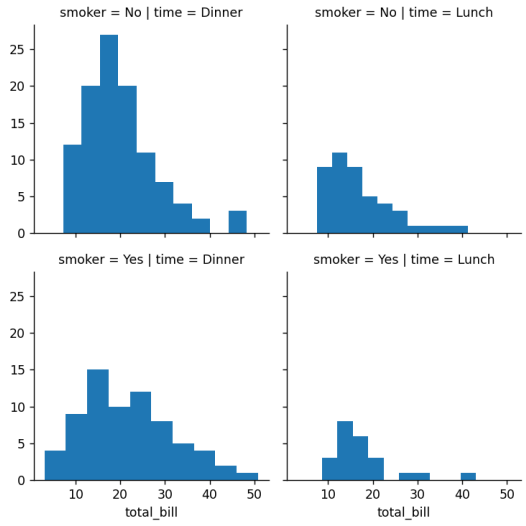

Figure 6 Relationship between smoker and time variables based on Total Bill

stable data distribution compared to non-smokers during dinner. While non-smokers also

have a fairly wide distribution in the average total bill nearing $50, their data is more concentrated in the $10–$30 range.

Finally, let's explore the relationship between total bill, tip, and smoker status. What can we uncover from this? Below is a graph showing the relationship between these three variables.

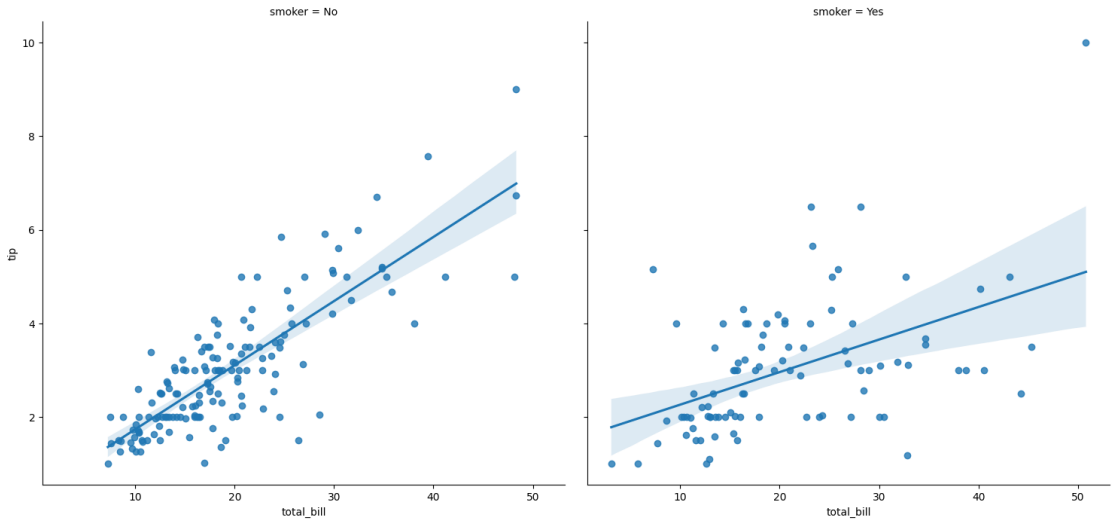

Figure 7 Relationship between tip and total bill variables based on the smoker variable

From the graph, non-smoking customers appear to be more consistent, as indicated by the steeper line and data points closer to the line, suggesting that they tend to give tips more predictably based on their total bill. In contrast, smoking customers seem more inconsistent, as shown by the less steep line and the wider spread of data points away from the line, indicating that their tipping habits are more unpredictable.

Final Conclusion

From the analysis of the provided data, we can draw several key insights about customer behavior at the restaurant:

1. Transaction Patterns by Day
    a. Saturdays and Sundays are the busiest days, with Saturday being the day with the highest number of transactions. This suggests that weekends attract more customers, possibly due to social or family dining habits.
    b. Thursdays and Fridays have fewer transactions, but Friday shows more even tip distribution, indicating a steady flow of customers preparing for the weekend.
2. Customer Demographics
    c. Male customers outnumber female customers.

d. There are more non-smokers than smokers, highlighting that a significant portion of the restaurant's customer base consists of non-smokers.

3. Spending and Tip Distribution
    e. Weekend customers (particularly on Sundays) tend to spend more and give higher tips, supporting the notion that social gatherings or family meals take place more frequently on these days.
    f. On Thursday, tips are generally lower, with a concentration in the $1–$3 range, which may indicate more conservative spending as it's still a weekday.
    g. There is a positive correlation between total bill and tips, with the majority of customers spending $10–$20 and giving tips in the $1.5–$4 range.
4. Behavior of Smokers vs. Non-Smokers
    h. Both smokers and non-smokers prefer to visit the restaurant for dinner rather than lunch, with smokers having a higher average total bill (sometimes exceeding $50).
    i. Non-smokers tend to tip more predictably based on their total bill, while smokers exhibit more variability and unpredictability in their tipping habits.
5. General Observations
    j. The restaurant is busiest during weekends and dinnertime, indicating these periods are prime for customer influx and higher earnings.
    k. Smokers spend more during dinner, but their tipping behavior is less consistent compared to non-smokers, who tend to be more stable in their spending and tipping patterns.

Overall, the data indicates that weekends, particularly Saturday and Sunday, are the most profitable days for the restaurant, with more transactions and higher tips. The majority of customers are male, non-smokers, and prefer dinner over lunch. The positive correlation between total bill and tips suggests that larger bills result in larger tips, though smokers are less predictable in their tipping. This information could help the restaurant optimize staffing, promotions, and customer service to cater to peak times and customer segments more effectively.