



AAWE

TOUCH BISTRO DATA ANALYSIS

UNDERSTANDING DATA ANALYSIS HELPS BUSINESSES
MAKE INFORMED DECISIONS, OPTIMIZE PERFORMANCE,
AND DRIVE GROWTH.



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THE PROBLEM

- The pandemic has forced all public places to shut down. As a result, **many businesses**, such as eateries, **struggle to cover financial costs** to continue with their services. To make up for severe financial debt, restaurants resort to **inflating their menu prices**.
- The problem with this action is that restaurants are attracting **fewer customers**. Customers are their main source of income, and part of it is used to cover financial costs.
- Most recently, Trump has planned to implement a **25% tariff on Canadian products**, which would deteriorate Canada's economic situation. This will also **negatively impact local businesses**.
- Human resources are also a big factor for costs that the company faces, and after the multiple layoffs during the pandemic, companies are starting to recover






OUR MISSION


Our mission is to create a model that allocates an appropriate number of staff on a given week/day/holiday/hour based on past data from the datasets. That is, if more customers show up in a given time frame, the restaurant can use the data from the model to decide to hire more or less personnel during those peak times. It is up to the restaurant to make a decision based on the data we collect.

Methodology: First, we created graphs using the python pandas library to gain insights on trends. We then found the frequency of the bills. Then, we trained a model with scikit-learn's Random Forest Regressor using those columns to predict an average number of customers that the restaurant could expect on any day when given a user inputs a concept, a date, and a time.

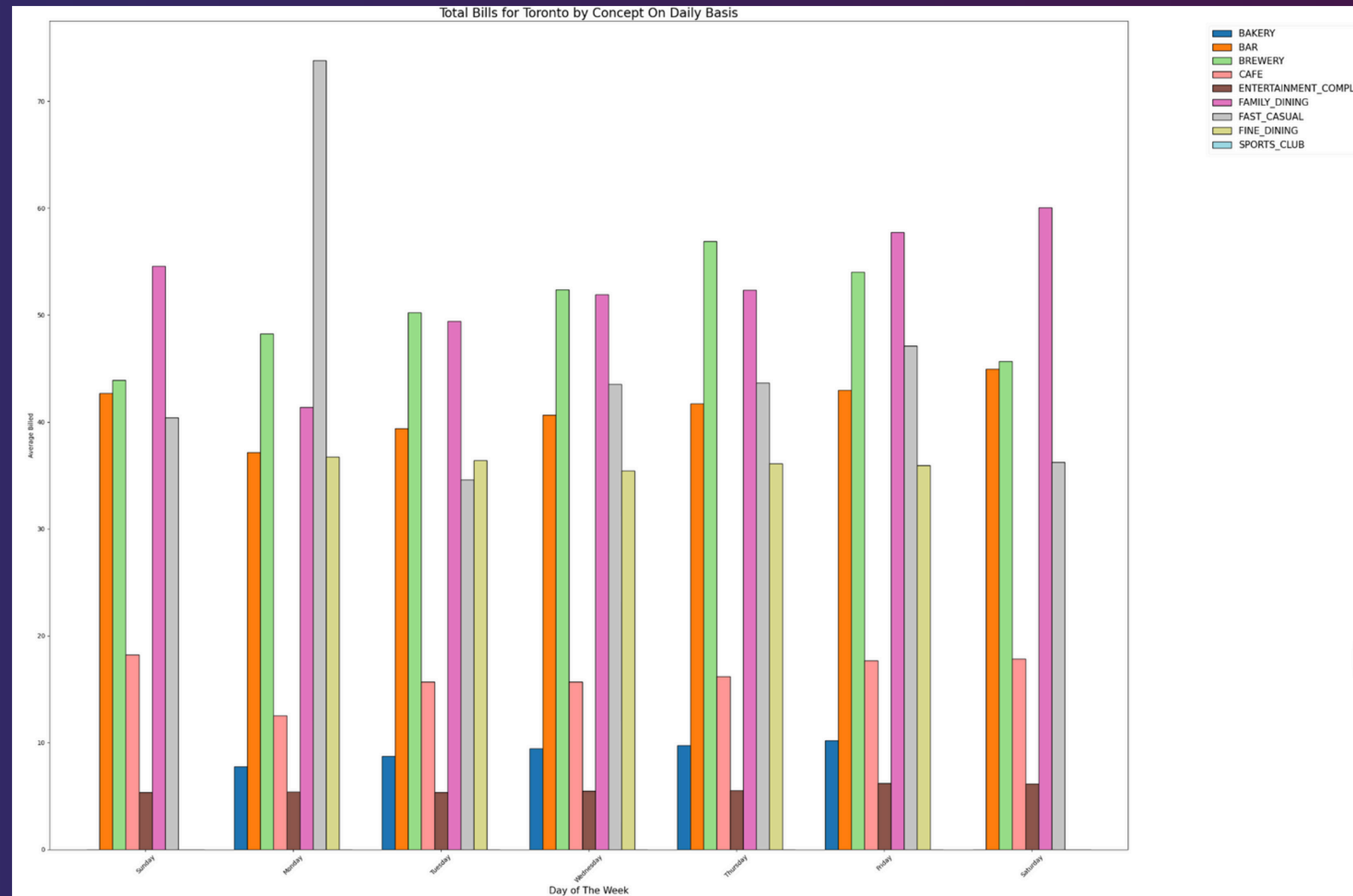




COLUMNS WE USED

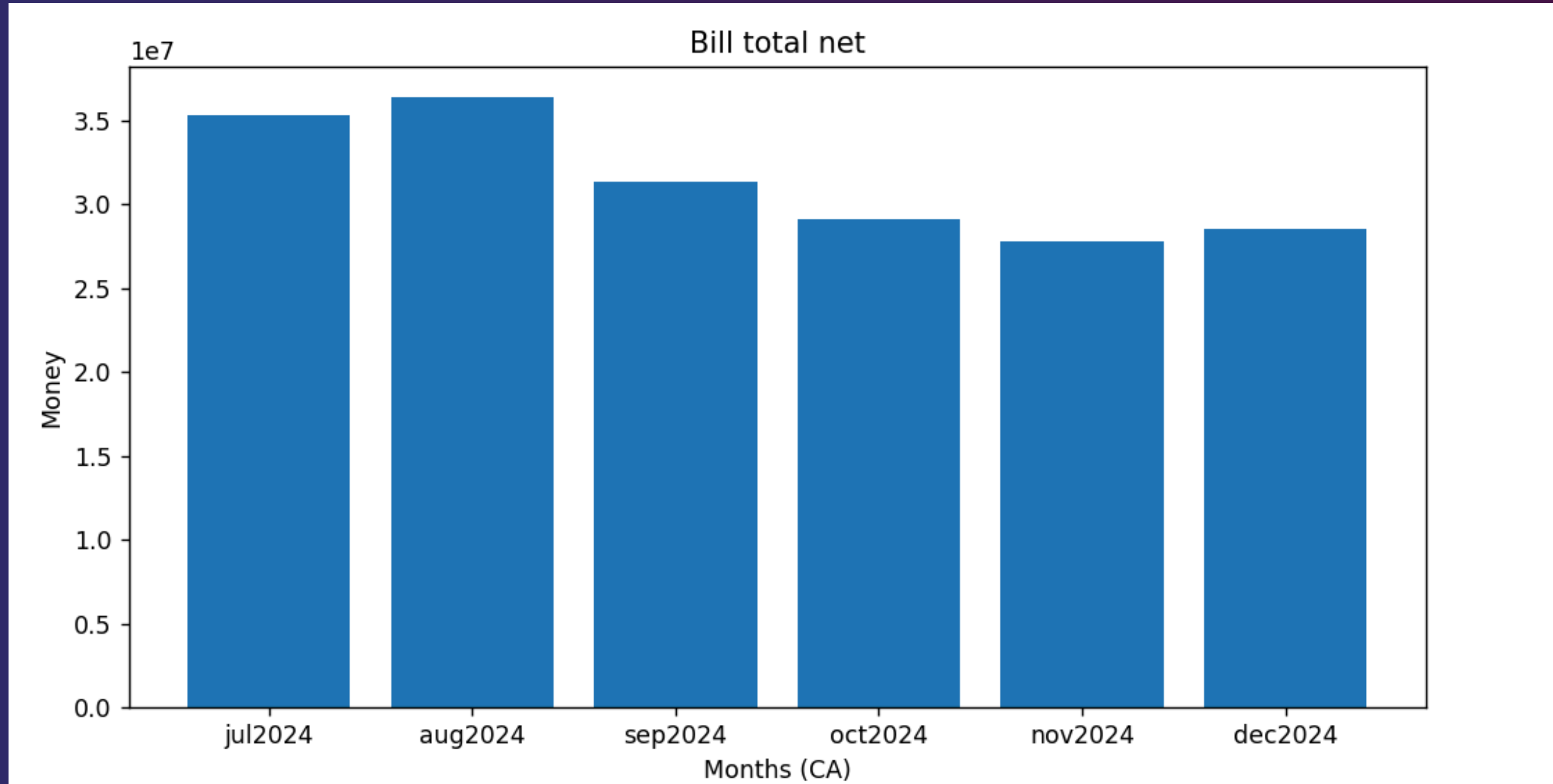
- bill_paid_at_local
 - business_date
 - concept
 - city
 - bill_total_net
 - venue_xref_id
- 

TREND FOR WEEKLY TO DETERMINE THE CITY CONCEPT WITH THE AVERAGE BILL SPANNING ACROSS WEEK



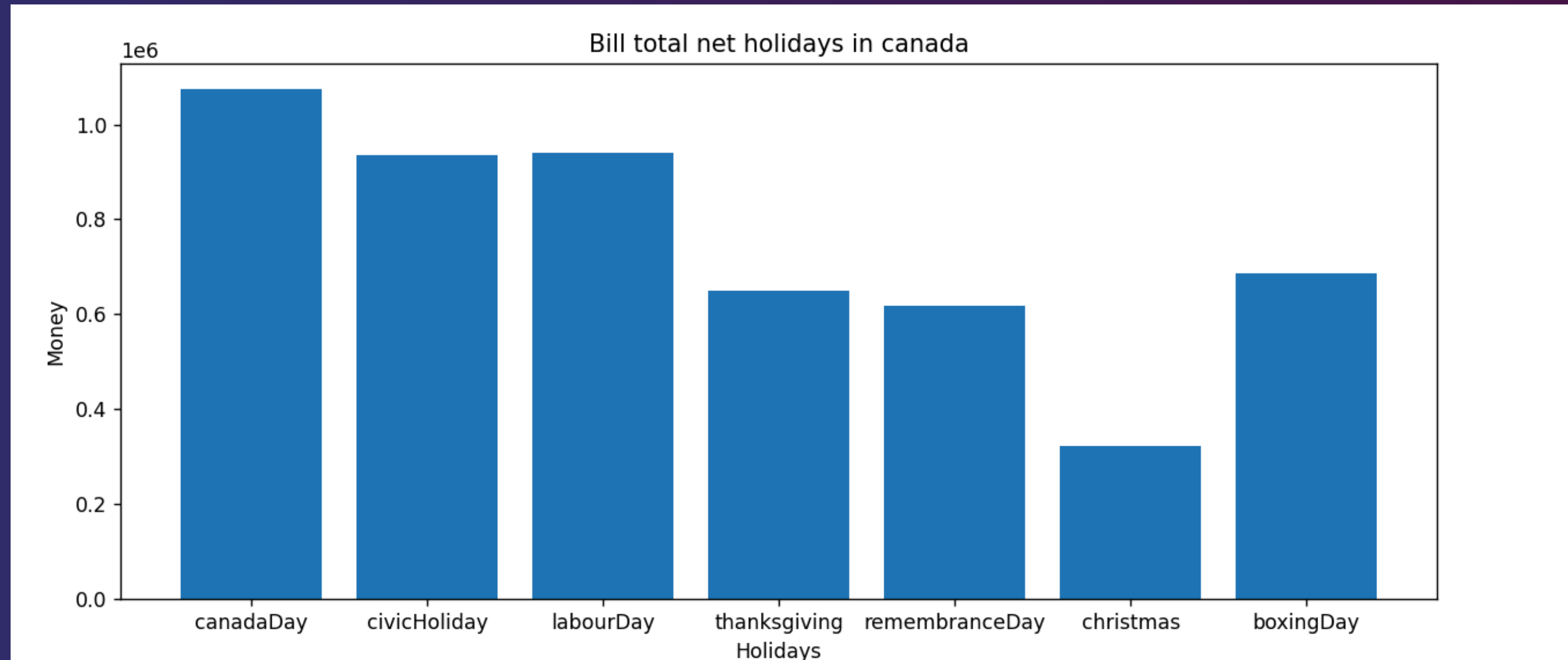
Insight: Friday and Saturday usually have more transactions. However, Monday for fast casual, it is more than all other data.

Total Bills Paid Per Month (Canada)



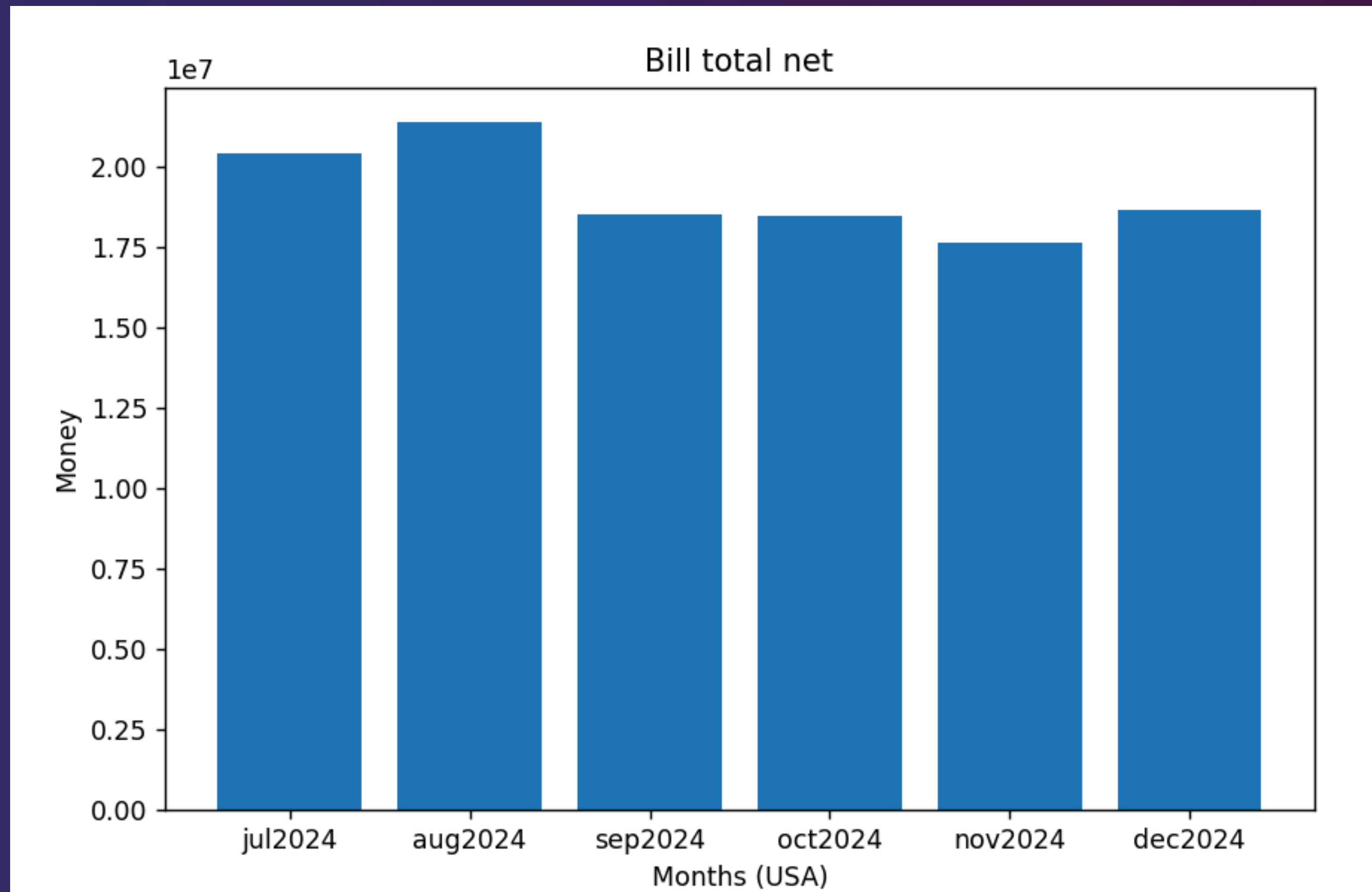
Insights: It appears that the bill net total is higher during the summer season and then gradually decrease as the seasons get colder

Trends For Which Holidays Make The Most Money (Canada)



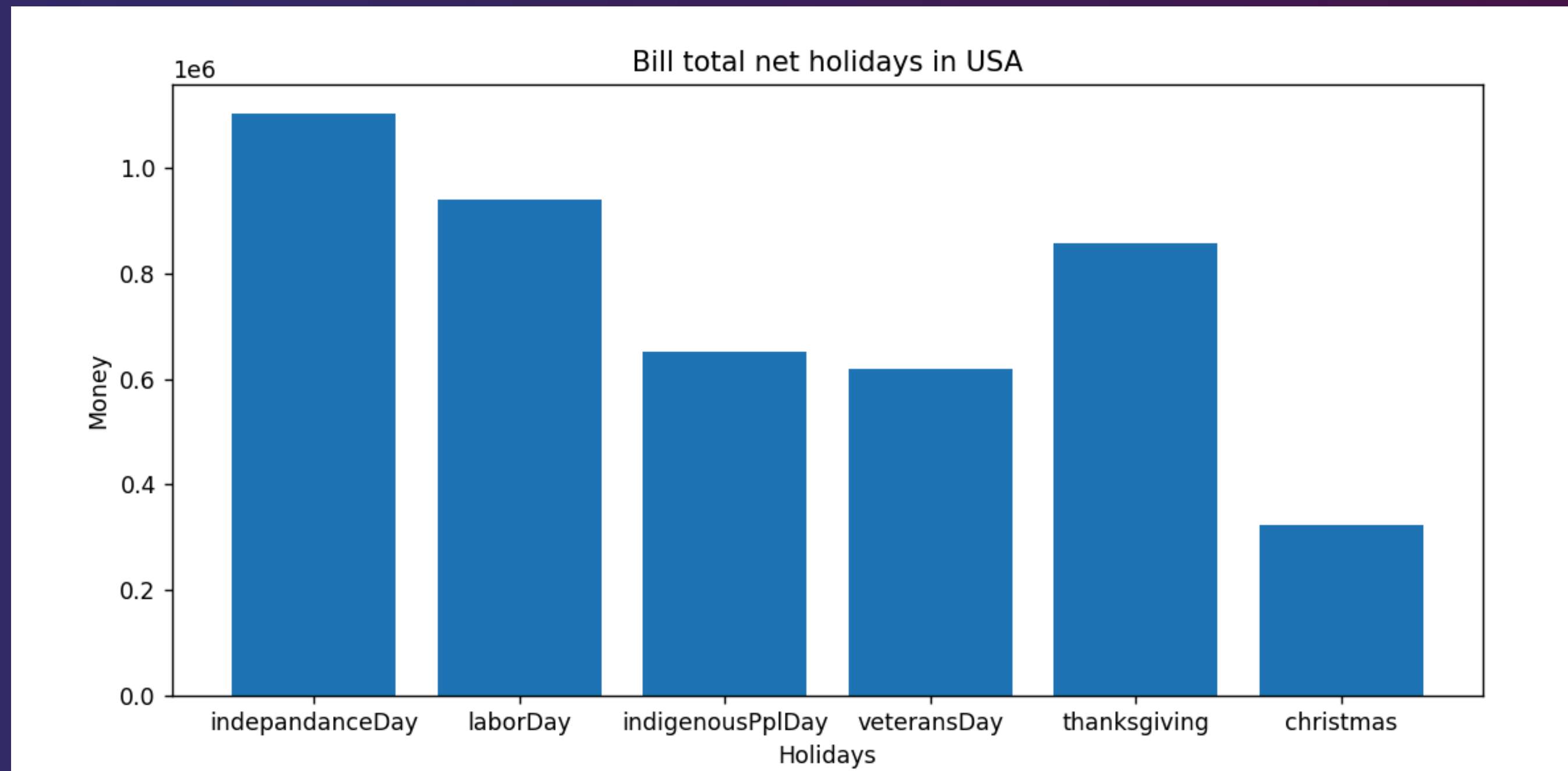
Insights: We compared the bill net total for a holiday to the average bill net total in the month that it's in. We find that Canada Day is on par with the monthly average; Civic Holiday, Labour Day, Thanksgiving, Remembrance Day, Boxing Day and especially Christmas are less

Total Bills Paid Per Month (USA)



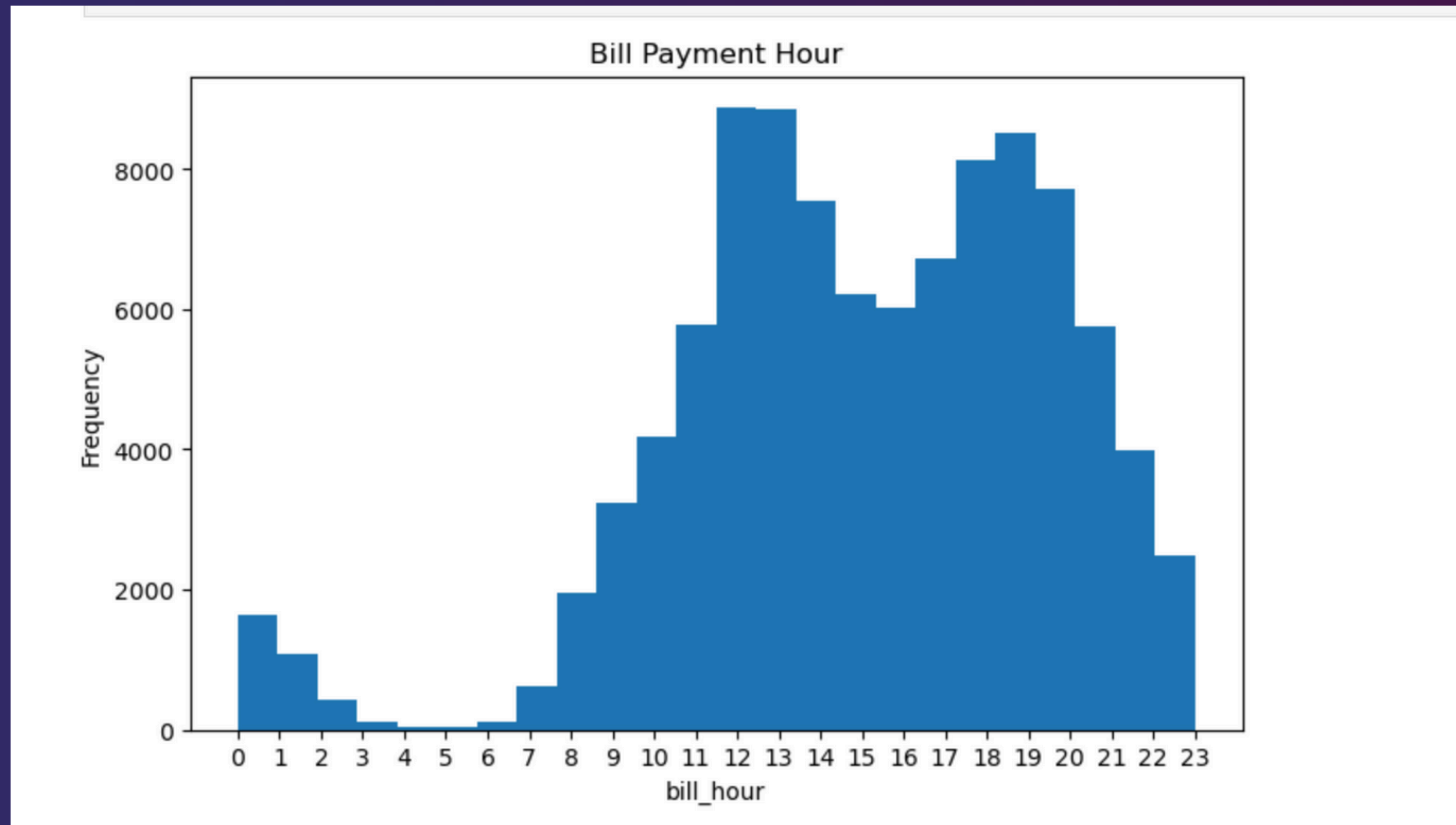
Insights: Similar trends less money, probably less chains are using TouchBistro's services in the US or just not a lot of them contributed their data for this challenge

Trends For Which Holidays Make The Most Money (USA)



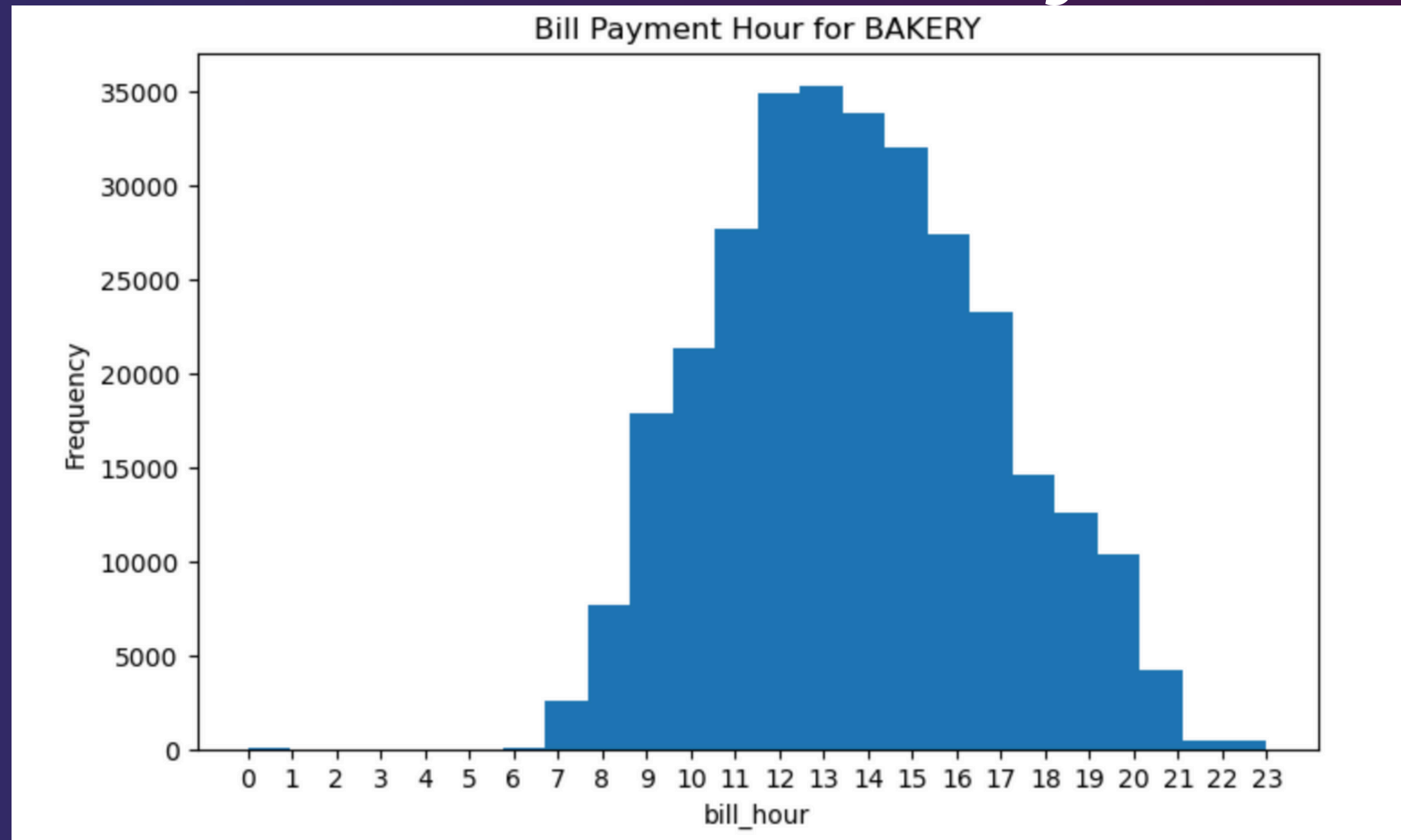
Insights: Similarly we compared the bill net total for a holiday to the average bill net total in the month that it's in. We find that Independence Day, Labor Day, Indigenous People's Day, Veterans Day and Thanksgiving make more than the monthly average; Christmas makes less

Trends for Which Hour of the Day Sees the Most Customers



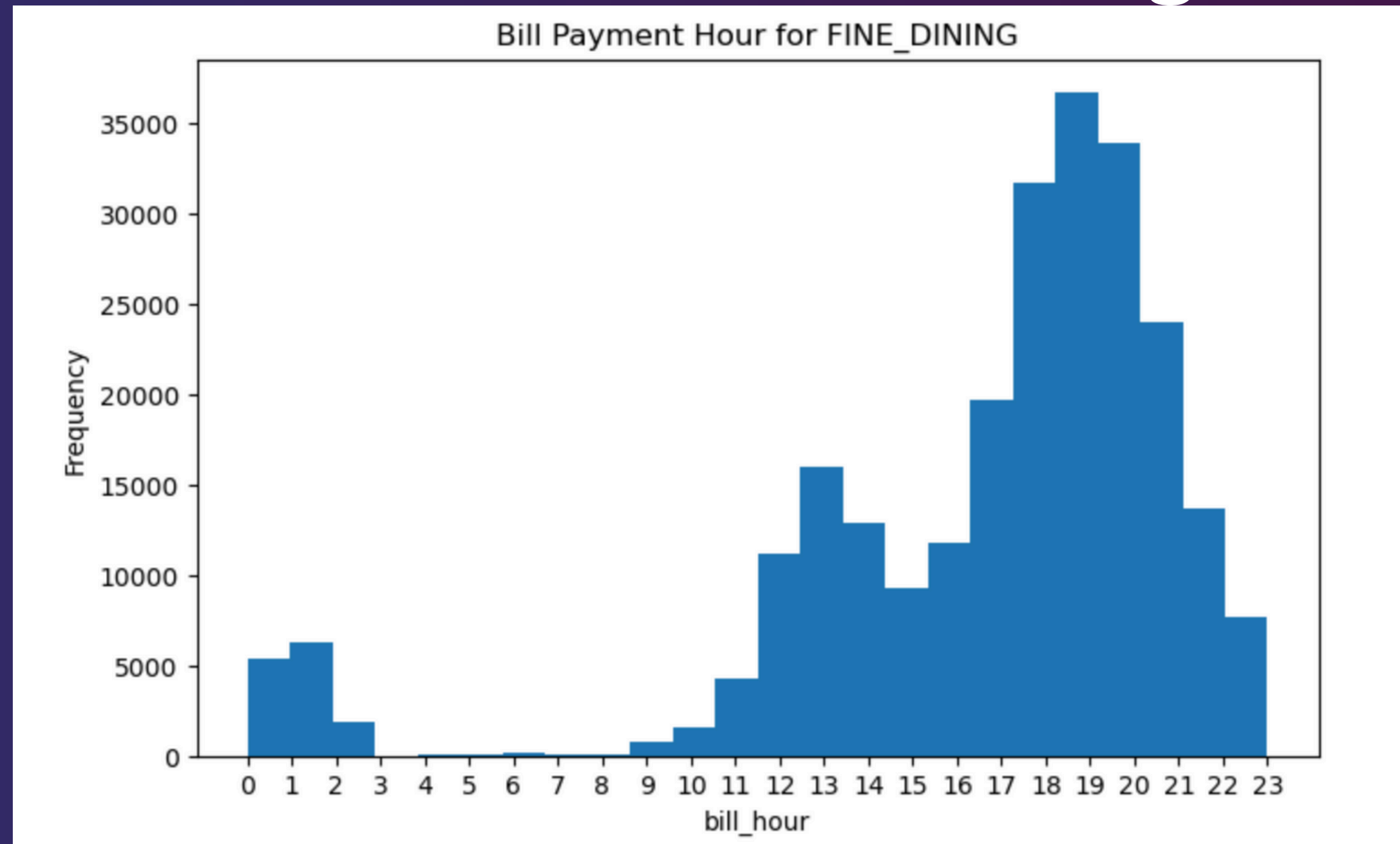
Insights: Total bills paid throughout all concepts, customers overall tend to come in during peak hours between 11-14 and 17-20

Trends for Which Hour of the Day Sees the Most Customers: Bakery



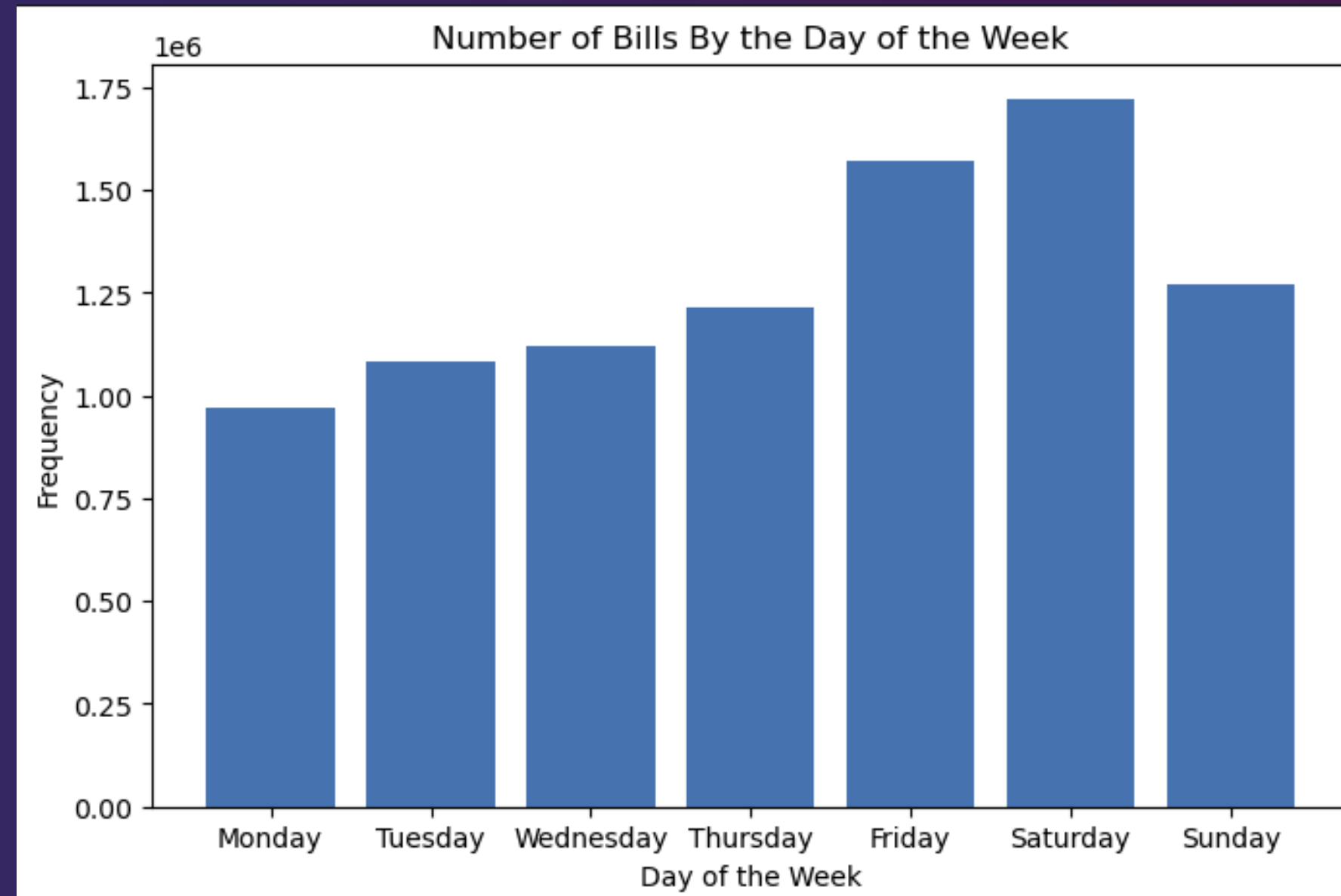
Insights: Different concept food vendors see different peak times, bakeries peak around 12 - 16

Trends for Which Hour of the Day Sees the Most Customers: Fine Dining



Insights: Fine dining peaks around 17-20

Total Bills Paid Per Day of the Week



Insights: Fridays and Saturdays tend to be the peak businesses days



OUR SOLUTION / CONCLUSION

We created a model to predict the number of customers on any day of a given year. By doing so, we can allow restaurants to efficiently allocate a certain number of staff each day so that there is no shortage or waste.

For instance the model states that throughout all concepts:

- The mean number of bills in an hour is 10.44
- The median of bills in an hour is 6
- The max number of bills in an hour is 370

For specific concepts:

- At Bars on Saturdays at 8PM, there will be: 12.7 Transactions
- At Bars on Fridays at 10PM, there will be: 13.5 Transactions



FUTURE

EXPANSIONS

Other Factors that we may want to consider in our model:

- Consider incorporating UI Interface technology such as Streamlit into the code.
- With more data we can provide more specific insights for each specific restaurant instead of a city/concept in general and create a dashboard to display those results for businesses.

Thank You!