Introduction

This is the portfolio project for the SQL module in my data analytics boot camp at atomcamp. We were provided with a dataset to run various queries and perform analysis on it. I thoroughly enjoyed working on this project, as it allowed me to enhance my SQL skills, develop an analytical mindset, and gain insights into business acumen.

I performed extra analyses and queries beyond the initial requirements to gain deeper insights into customer behavior and churn dynamics. These findings are presented below, showcasing the comprehensive nature of my investigation.

Moreover, as part of this project, I have written a detailed article on Medium and created a GitHub repository for the project. Here are the links to both:

- Medium Article
- GitHub Repository

Let's dive into the project!

Dataset Overview

The dataset used for this analysis contains information about 7,043 customers from a fictional telco company in California, focusing on customer churn. Key variables include customer demographics (age, gender, and location), service information (types of services used, contract types, and monthly charges), payment methods (e.g., credit card and electronic check), and churn status indicating whether a customer has left the service.

The dataset was sourced from the IBM Telco Customer Churn dataset, which is available on GitHub. The preprocessing steps involved cleaning the data by handling missing values and removing unnecessary columns.

SQL Queries and Analysis

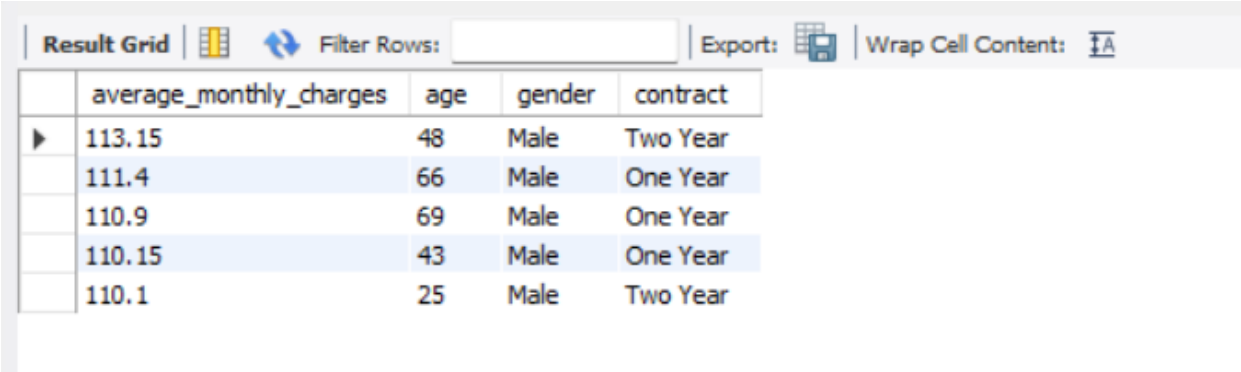
Here are some of the queries and their analysis that I performed during this project:

Query 1

Considering the top 5 groups with the highest average monthly charges among churned customers, how can personalized offers be tailored based on age, gender, and contract type to potentially improve customer retention rates?

SQL Query

```
select round(avg(monthly_charge), 2) as average_monthly_charges , age, gender, contract

from telco_churn

where churn_label = 'Yes'

group by age, gender, contract

order by average_monthly_charges desc

limit 5;
```



average_monthly_charges	age	gender	contract
113.15	48	Male	Two Year
111.4	66	Male	One Year
110.9	69	Male	One Year
110.15	43	Male	One Year
110.1	25	Male	Two Year

Analysis

The top 5 churned customers with the highest average monthly charges are all male, aged between 25 and 69. Most had one-year contracts, with only two on two-year contracts. Older customers, especially those in their 60s, are likely paying more, possibly expecting better service or benefits. Younger customers on longer contracts may feel their needs aren't being met despite their commitment.

To reduce churn, offering loyalty rewards or discounts for older customers could help retain them. For one-year contracts, providing renewal incentives or discounted upgrades before their term ends could prevent churn. For younger customers, adding flexible services or entertainment bundles that align with their interests might increase satisfaction. Personalized offers based on age and contract type could significantly boost retention.

Query 2

What are the feedback or complaints from those churned customers?

SQL Query

```
select churn_category, churn_reason, count(*) as number_of_customers
```

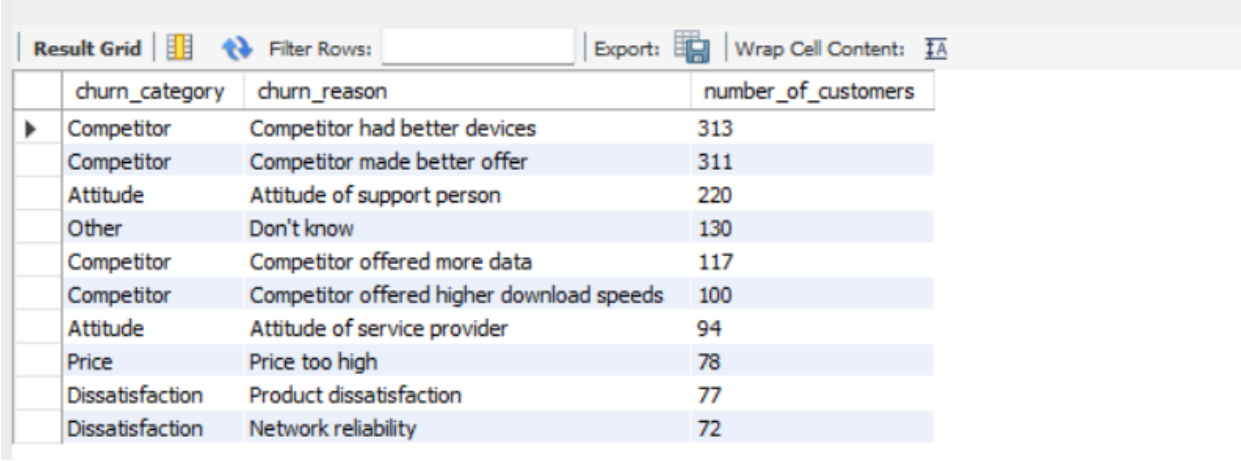
from telco_churn

where churn_label = 'Yes'

group by churn_category, churn_reason

order by number_of_customers desc

limit 10;



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

churn_category	churn_reason	number_of_customers
Competitor	Competitor had better devices	313
Competitor	Competitor made better offer	311
Attitude	Attitude of support person	220
Other	Don't know	130
Competitor	Competitor offered more data	117
Competitor	Competitor offered higher download speeds	100
Attitude	Attitude of service provider	94
Price	Price too high	78
Dissatisfaction	Product dissatisfaction	77
Dissatisfaction	Network reliability	72

Analysis

The majority of churned customers cited **competitor-related reasons**, with 313 leaving due to better devices and 311 due to better offers. Additionally, many customers felt **dissatisfied with support**—220 mentioned the attitude of support personnel, and 94 cited the attitude of the service provider. Price and product dissatisfaction were also significant, with 78 leaving due to high prices and 77 because of dissatisfaction with the product.

To address these issues, improving customer support, offering competitive deals, and ensuring better device options or pricing plans could help reduce churn. Special focus on network reliability and service quality could also mitigate dissatisfaction.

Query 3

How does the payment method influence churn behavior?

SQL Query

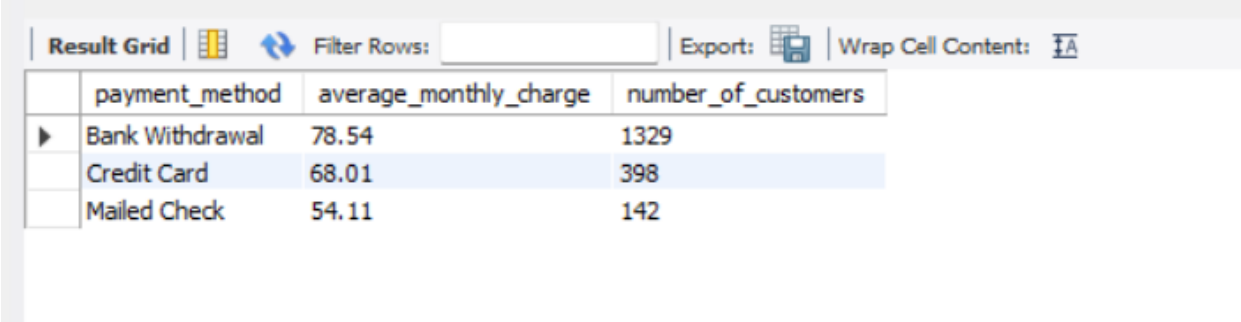
select payment_method, round(avg(monthly_charge), 2) as average_monthly_charge, count(*) as number_of_customers

from telco_churn

where churn_label = 'Yes'

group by payment_method

order by number_of_customers desc;



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

payment_method	average_monthly_charge	number_of_customers
Bank Withdrawal	78.54	1329
Credit Card	68.01	398
Mailed Check	54.11	142

Analysis

The data shows that customers using **bank withdrawal** as a payment method have the highest average monthly charge at **$78.54** with **1,329** customers. In contrast, those using **credit cards** pay an average of **$68.01** (398 customers), while **mailed checks** have the lowest average charge at **$54.11** (142 customers).

This suggests that customers who opt for bank withdrawal are willing to pay more, possibly indicating higher loyalty or satisfaction. Conversely, those using mailed checks, who have the lowest average charges, may be more price-sensitive or less engaged.

To improve retention, targeting promotions or personalized offers toward credit card and mailed check users could enhance their satisfaction and reduce churn. Additionally, reinforcing the benefits of automatic payments through bank withdrawals may help maintain their loyalty.

Additional Queries

Other than the required queries, I did some additional analysis:

Query 4

Which Internet Type Has the Highest Churn Rate?

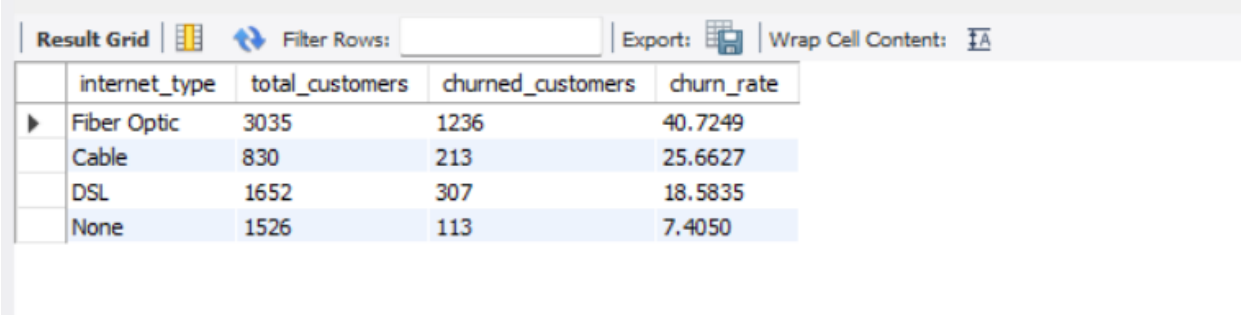
SQL Query

SELECT

internet_type,

COUNT(*) AS total_customers,

```
    SUM(churn_label = 'Yes') AS churned_customers,
    (SUM(churn_label = 'Yes') / COUNT(*)) * 100 AS churn_rate
FROM telco_churn
GROUP BY internet_type
ORDER BY churn_rate DESC;
```



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

internet_type	total_customers	churned_customers	churn_rate
Fiber Optic	3035	1236	40.7249
Cable	830	213	25.6627
DSL	1652	307	18.5835
None	1526	113	7.4050

Analysis

The **Fiber Optic** internet type has the highest churn rate at **40.72%**, with **1,236** customers out of **3,035** churning. In comparison, **Cable** has a churn rate of **25.66%** (213 customers), while **DSL** and **None** show much lower rates at **18.58%** (307 customers) and **7.41%** (113 customers), respectively.

This indicates that Fiber Optic customers are significantly more likely to leave, potentially due to dissatisfaction with service quality or pricing. To address this high churn rate, the company should investigate the underlying causes and enhance customer support, offer competitive pricing, or improve service reliability for Fiber Optic users. Targeted retention strategies may help retain these customers and reduce churn.

Query 5

How Do Contract Types Affect Churn Rates?

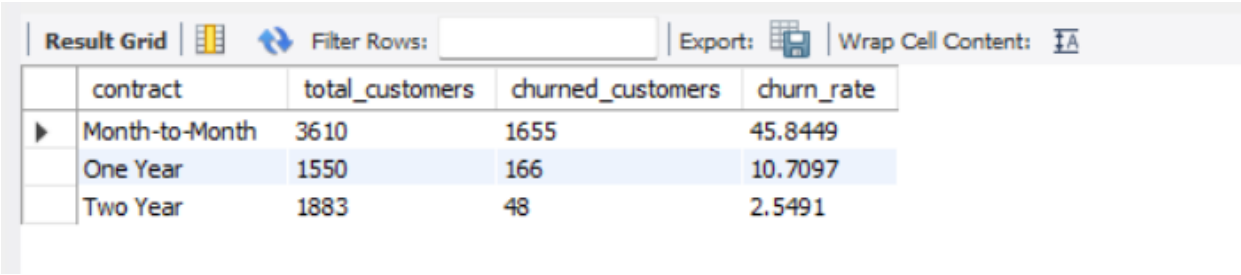
SQL Query

```
SELECT
    contract,
    COUNT(*) AS total_customers,
    SUM(churn_label = 'Yes') AS churned_customers,
    (SUM(churn_label = 'Yes') / COUNT(*)) * 100 AS churn_rate
```

FROM telco_churn

GROUP BY contract

ORDER BY churn_rate DESC;



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

contract	total_customers	churned_customers	churn_rate
Month-to-Month	3610	1655	45.8449
One Year	1550	166	10.7097
Two Year	1883	48	2.5491

Analysis

Month-to-Month contracts exhibit the highest churn rate at **45.84%**, with **1,655** out of **3,610** customers churning. In contrast, **One Year** contracts have a much lower churn rate of **10.71%** (166 customers), and **Two Year** contracts show the lowest rate at **2.55%** (48 customers).

This suggests that customers on Month-to-Month contracts are significantly more likely to leave, possibly due to a lack of commitment or satisfaction with services. To improve retention, the company should consider offering incentives for longer-term contracts or enhancing the value proposition for Month-to-Month users to encourage them to transition to more stable agreements.

Query 6

Is There a Correlation Between Satisfaction Score and Churn?

SQL Query

SELECT

satisfaction_score,

COUNT(*) AS total_customers,

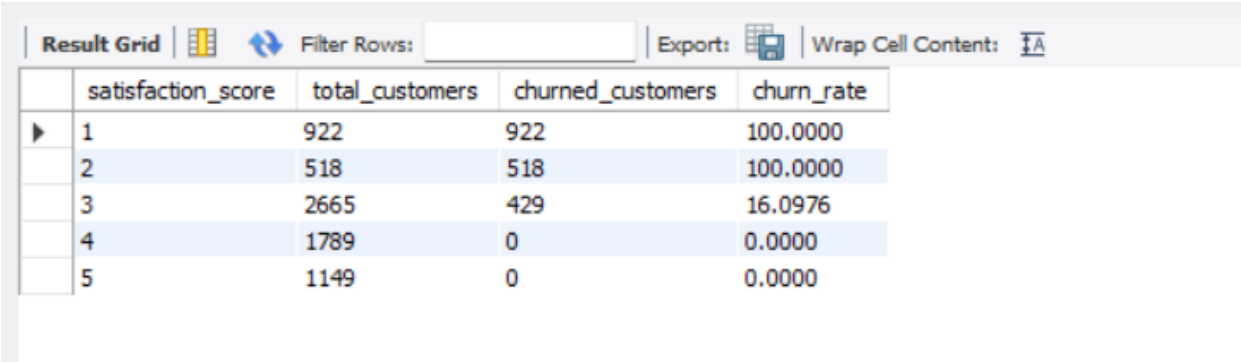
SUM(churn_label = 'Yes') AS churned_customers,

*(SUM(churn_label = 'Yes') / COUNT(*)) * 100 AS churn_rate*

FROM telco_churn

GROUP BY satisfaction_score

ORDER BY churn_rate DESC, satisfaction_score;



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

satisfaction_score	total_customers	churned_customers	churn_rate
1	922	922	100.0000
2	518	518	100.0000
3	2665	429	16.0976
4	1789	0	0.0000
5	1149	0	0.0000

Analysis

The data clearly shows a strong correlation between satisfaction scores and churn rates. Customers with a satisfaction score of **1** or **2** exhibit a **100% churn rate**, indicating total dissatisfaction. In contrast, those with a score of **3** have a churn rate of **16.10%** (429 out of **2,665**), while customers with scores of **4** and **5** show no churn at all.

This result is quite obvious: as satisfaction scores increase, churn rates decrease significantly. To enhance customer retention, it is crucial for the company to focus on improving customer satisfaction, particularly targeting those who are currently unsatisfied, as addressing their concerns could lead to a substantial reduction in churn.

Insights and Recommendations

1. **Targeted Offers for High Spenders**: Focus on customers aged 43-69 who pay over $110 monthly, offering tailored loyalty programs or exclusive discounts to enhance retention.
2. **Competitor Awareness**: Address the major churn reasons linked to competitors by improving device offerings and making competitive pricing adjustments, especially in the Fiber Optic segment.
3. **Enhancing Support Services**: Invest in customer support training to improve attitudes and responsiveness, particularly for churned customers who cited dissatisfaction with support personnel.
4. **Payment Method Engagement**: Increase marketing efforts for automatic bank withdrawals and create personalized communication to engage credit card and mailed check users, emphasizing convenience and value.
5. **Fiber Optic Improvements**: Analyze service issues reported by Fiber Optic customers to develop targeted solutions that enhance reliability and service quality, aiming to reduce the 40.72% churn rate.

6. **Contract Value Propositions**: For Month-to-Month customers, create limited-time offers to incentivize transitions to One or Two Year contracts, emphasizing the savings and benefits of longer commitments.
7. **Satisfaction Score Initiatives**: Develop a feedback loop with low-scoring customers to identify pain points, implementing actionable changes to improve overall satisfaction and reduce the high churn rates associated with low scores.

Conclusion

This project has greatly enhanced my understanding of SQL, critical analysis, and business acumen. By examining customer churn factors and developing targeted strategies for retention, I gained valuable insights into data-driven decision-making. The experience not only improved my analytical skills but also deepened my appreciation for the importance of customer satisfaction and strategic offerings. Overall, this analysis has been an invaluable learning opportunity that will benefit my future endeavors in data analytics.