

# INTRODUCTION

This project focuses on analyzing a dataset of financial consumer complaints to uncover insights about customer grievances in the financial sector. By leveraging SQL for data cleaning, transformation, and analysis, this project aims to identify trends in complaints, assess the timeliness of company responses, and provide actionable insights to enhance customer satisfaction and service delivery.

# **OBJECTIVE**

Analyze consumer complaints data to identify trends, assess timely responses by companies, and highlight key areas for improvement in customer service.

## **ABOUT DATA**

Consumer complaints on financial products & services for Bank of America from 2017 to 2023. The dataset includes critical information such as complaint submission methods, date of submission to the CFPB, product categories, issues faced by consumers, and company responses.



# TOOL USED

MySQL was used to query this SQL project. The areas of SQL covered in this project:

- Aggregate Functions
- Window Functions
- Common Table Expressions
- Date Functions

# **DATA PREPARATION**

The data import was done using MySQL Workbench. I created a database schema and table for data import in csv file. The table was constraints to its csv file. It consists of 62,516 rows and 12 columns.



#### Create the database schema and tables

```
-- Create a new schema
       CREATE SCHEMA `consumer complaints`;
 2 •
 3
       -- Create new table
 4
 5 ● ○ CREATE TABLE consumer_complaints.`complaints` (
       complaint id int not null,
 6
       submitted via varchar(255),
 7
       date submitted date,
 8
       date_received date,
 9
       state varchar(10),
10
       product varchar(255),
11
       sub product varchar(255),
12
       issue varchar(255),
13
       sub_issue varchar(255),
14
       company_public_response text,
15
       company response varchar(255),
16
       timely_response varchar(20),
17
       primary key (complaint_id)
18
19
       );
```

#### Total no of rows and columns

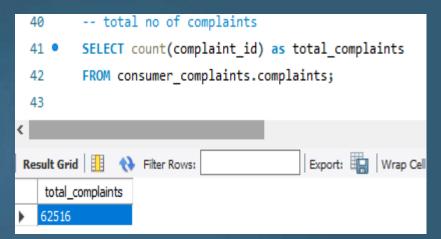
```
-- total rows
       SELECT count(*) as row count
       FROM consumer complaints.complaints;
sult Grid
             Filter Rows:
                                           Export:
 row_count
62516
     -- total columns
     SELECT count(*) as column_count
     FROM information schema.columns
     WHERE table schema = 'consumer complaints'
     AND table name = 'complaints'
                                     Export: Wrap
ult Grid
          ♦ Filter Rows:
column_count
12
```

# **EXPLORATORY DATA ANALYSIS**

## **Complaints Analysis**

Analysis consumer complaints across submission methods, product categories and issues.

- Total number of complaints



- Total number of unresolved complaints

```
-- total no of unresolved complaints

45 • SELECT count(complaint_id) as total_unresolved_complaints

46 FROM consumer_complaints.complaints

47 WHERE company_response = 'In progress';

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

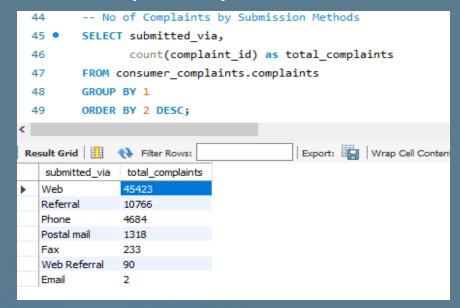
total_unresolved_complaints

1494
```

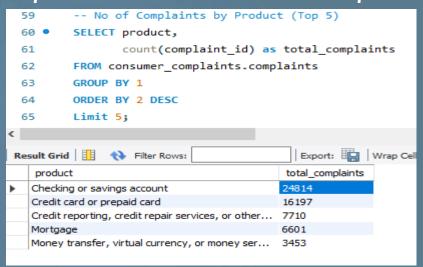
**Key Insight:** There is a total of **62,516** consumer complaints, of which **61,022** have been resolved, while **1,494** remain unresolved.



- No of Complaints by Submission Method



- Top 5 Products with the Most Complaints

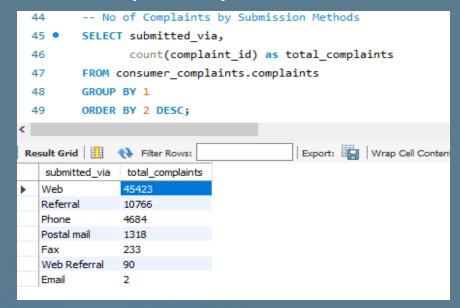


- Top 5 Issues for Each of the Top 5 Products

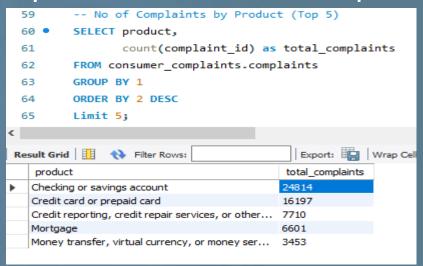
```
0 0 0
 WITH
product_issue AS (
 SELECT
     product,
     issue,
     COUNT(complaint_id) AS total_issues,
     rank() over (partition by product order by product, COUNT(complaint id) desc) AS rank issue
 FROM
     consumer_complaints.complaints
 GROUP BY
     product, issue
SELECT product,
        issue,
        total issues
FROM product_issue
 WHERE rank_issue = 1
LIMIT 5;
                                                                                                  total issues
    product
                                                 issue
   Checking or savings account
                                                                                                 15109
                                                Managing an account
   Credit card or prepaid card
                                                Problem with a purchase shown on your statement
                                                                                                 4415
   Credit reporting, credit repair services, or other... Incorrect information on your report
                                                                                                 4145
   Debt collection
                                                Attempts to collect debt not owed
                                                                                                 1351
   Money transfer, virtual currency, or money ser... Fraud or scam
                                                                                                 1951
```

**Key Insight:** The majority of consumer complaints are related to **Check or Savings account services**, with the primary issue being difficulties in managing an account. For **Credit Card or Prepaid Card services** 

- No of Complaints by Submission Method



- Top 5 Products with the Most Complaints



- Top 5 Issues for Each of the Top 5 Products

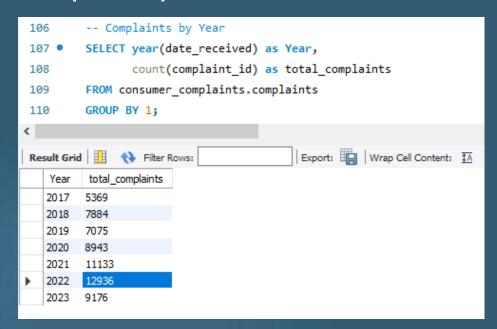
```
0 0 0
 WITH
product_issue AS (
 SELECT
     product,
     issue,
     COUNT(complaint_id) AS total_issues,
     rank() over (partition by product order by product, COUNT(complaint id) desc) AS rank issue
 FROM
     consumer_complaints.complaints
 GROUP BY
     product, issue
SELECT product,
        issue,
        total issues
FROM product_issue
 WHERE rank_issue = 1
LIMIT 5;
                                                                                                  total issues
    product
                                                 issue
   Checking or savings account
                                                                                                 15109
                                                Managing an account
   Credit card or prepaid card
                                                Problem with a purchase shown on your statement
                                                                                                 4415
   Credit reporting, credit repair services, or other... Incorrect information on your report
                                                                                                 4145
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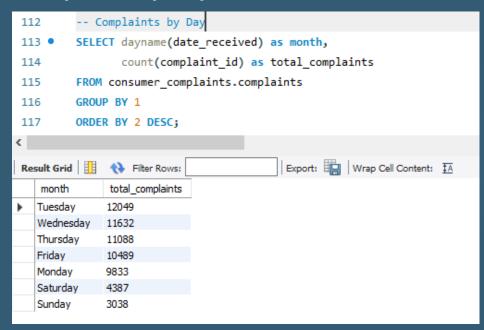
#### **Trends Over Time**

Analysis the seasonal trends and patterns in consumer complaints.

#### - Complaints by Year



#### - Complaints by Day



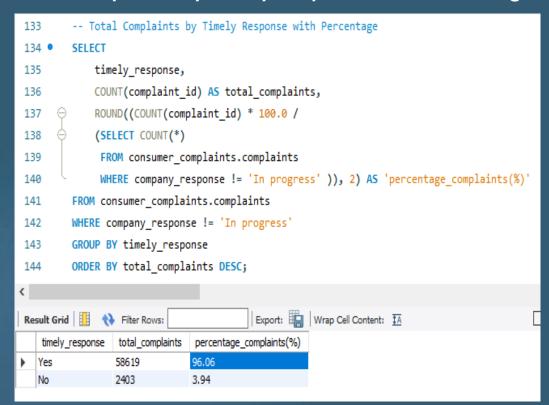
**Key Insight:** They have been a consistent yearly increase in complaints from 2020 – 2022 with a significant decline in 2023. The majority of consumer complaints are submitted on weekdays, with significantly fewer received during weekends.



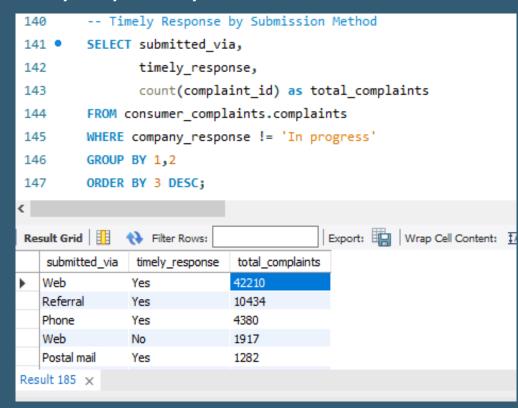
## **Timely Response Analysis**

Analysis the timeliness of responses provided to consumer complaints.

- Total Complaints by Timely Response with Percentage

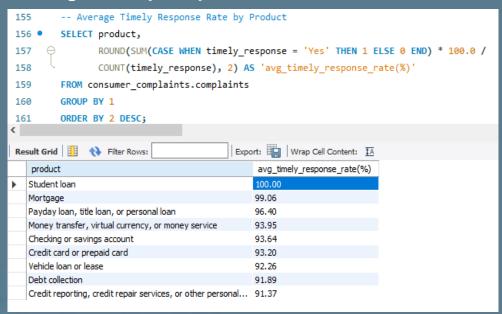


- Timely Response by Submission Method

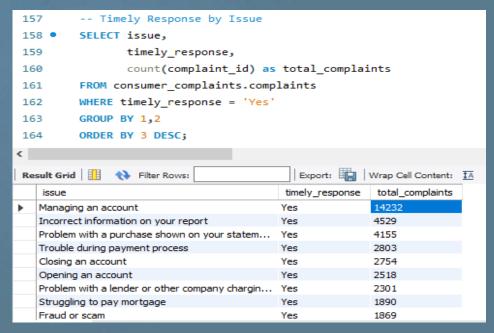


**Key Insight:** The company demonstrates excellent customer service efficiency, with a high percentage of complaints (96.06%) receiving a timely response ("Yes"). The web channel demonstrates the highest rate of timely responses, while the phone channel has the lowest.

#### - Average Timely Response Rate Products



#### - Top 5 Products with the Most Complaints



#### - Timely Response Over Time

```
-- Timely Response Over Time
157
        SELECT year(date received),
158
159
                timely response,
                count(complaint_id) as total_complaints
160
         FROM consumer_complaints.complaints
161
162
         WHERE timely response = 'Yes'
163
        GROUP BY 1,2
164
        ORDER BY 1,2
                                          Export: Wrap Cell Content:
year(date_received)
                    timely_response
                                  total_complaints
  2017
                   Yes
                                 5360
  2018
                   Yes
                                 7872
  2019
                   Yes
                                 7068
  2020
                   Yes
                                 8881
  2021
                   Yes
                                 9909
  2022
                   Yes
                                 12376
  2023
                   Yes
                                  7153
```

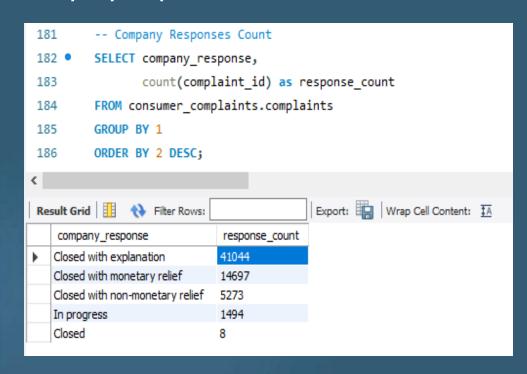
#### - Average response times by products

```
-- Average response times by product
 98
          SELECT product,
 99
                  ROUND(AVG(datediff(date received, date submitted)), 2) AS avg response times
100
          FROM consumer complaints.complaints
          GROUP BY 1
101
102
          ORDER BY 2;
Result Grid | Filter Rows:
                                                Export: Wrap Cell Content: IA
   product
                                              avg_response_times
  Credit reporting, credit repair services, or other...
   Money transfer, virtual currency, or money ser... 1.06
   Credit card or prepaid card
                                             1.13
   Checking or savings account
                                              1.23
   Vehicle loan or lease
                                             1.44
   Debt collection
                                              1.64
   Payday loan, title loan, or personal loan
                                              1.68
   Mortgage
                                              1.86
   Student loan
                                             2.13
```

## **Complaint Resolution Outcome**

Analysis the company responses provided to consumer complaints.

- Company Responses Count



- Company Responses by Product

```
168 • ⊖ WITH responses as (
169
           SELECT product,
170
                   company response,
171
                   count(complaint id) as response count,
172
                   rank() over (partition by product order by product, count(complain
173
           FROM consumer complaints.complaints
174
          GROUP BY 1,2
175
176
           SELECT product, company response, response count
177
           FROM responses
178
           WHERE rank count IN (1,2,3);
Result Grid | Filter Rows:
                                             Export: Wrap Cell Content: IA
    product
                                                company response
                                                                              response count
   Checking or savings account
                                                                              14836
                                               Closed with explanation
                                                                              8027
   Checking or savings account
                                               Closed with monetary relief
   Checking or savings account
                                               Closed with non-monetary relief
                                                                             1241
   Credit card or prepaid card
                                               Closed with explanation
                                                                              9361
   Credit card or prepaid card
                                               Closed with monetary relief
                                                                              4798
   Credit card or prepaid card
                                               Closed with non-monetary relief
                                                                             1621
   Credit reporting, credit repair services, or other... Closed with explanation
                                                                              6067
   Credit reporting, credit repair services, or other... Closed with non-monetary relief
                                                                             1178
   Credit reporting, credit repair services, or other... Closed with monetary relief
                                                                              273
```

**Key Insight:** The majority of resolved complaints are either closed with an explanation or resolved by providing monetary relief to the consumers. Checking or savings accounts and credit card services are the most likely to result in monetary relief for consumers.

## SUMMARY OF FINDINGS

- There is a total of 62,516 consumer complaints, of which 61,022 have been resolved, while 1,494 remain unresolved.
- The majority of consumer complaints are submitted via Web and Referral channels.
- The majority of consumer complaints are related to **Check or Savings account services**, with the primary issue being difficulties in managing an account. For **Credit Card or Prepaid Card services**, the most common issue reported is problems with purchases.
- Credit reporting and money transfer services receive the fastest response times across all products, particularly when submitted through fax, email, or web channels.
- They have been a consistent yearly increase in complaints from 2020 2022 with a significant decline in 2023.
- The company demonstrates excellent customer service efficiency, with a high percentage of complaints (96.06%) receiving a timely response ("Yes"). This highlights the organization's strong commitment to addressing customer concerns promptly.
- The **web channel** demonstrates the highest rate of timely responses, while the **phone channel** has the lowest. This suggests that online customer service is more efficient compared to other communication channels.
- The **student loan service** achieves a **100%** average timely response rate, closely followed by the **mortgage service**. This highlights their strong commitment to providing excellent customer service for loan-related complaints.
- The majority of resolved complaints are either closed with an explanation or resolved by providing monetary relief to the consumers.
- Checking or savings accounts and credit card services are the most likely to result in monetary relief for consumers.

#### **RECOMMENDATIONS**

- Invest in enhancing web and referral submission channels, as they are the most popular methods for submitting complaints. Ensure these channels remain efficient and user-friendly.
- Focus on improving customer service efficiency for phone submissions, as this channel has a very low timely response rate. Consider allocating more resources or training for staff handling phone complaints.
- Focus on improving issue resolution processes for checking/savings accounts and credit card services, as
  these account for the majority of complaints. This includes resolving common issues such as account
  management difficulties and purchase problems.
- Investigate the reasons behind the decline in complaints and timely responses in 2023. This could involve analyzing resource allocation, changes in processes, or external factors affecting performance.
- Continue the excellent customer service efficiency for student loan and mortgage-related complaints, as these areas have achieved a near-perfect timely response rate.
- Ensure that products most likely to result in monetary relief (e.g., checking/savings accounts and credit cards) are prioritized for fair and consistent resolutions.



# **CONCLUSIONS**

This analysis highlights key insights into consumer complaint trends and the company's response efficiency. With a total of 62,516 complaints, the company has demonstrated strong performance in resolving 96.06% of complaints within the required time frame, showcasing its commitment to customer service excellence. The web channel is the most efficient for timely responses, while phone complaints require improvement. Loan services, including student loans and mortgages, exhibit the highest customer service standards.

By focusing on resource allocation, process improvements, and consumer education, the company can continue to excel in customer complaint management and maintain high levels of customer satisfaction.



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