

BEMM457

**Coursework 2: Mini business analytics
report**

By Anwesha Dhar, 16th of December 2024

Financial Consumer Complaints

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1. Introduction:

I, Anwesha Dhar, as an international student of University of Exeter, Devon (UK), am obliged to be a part of the course, MSc. Business Analytics, where our professor Dr Rom Okeke gave all of us an opportunity to work on a mini project analytics report - a complete individual report in which we are free to choose project with publicly free dataset available online and do analysis and important findings on the dataset that we chose. This opens an elbow room to upskill our ways of understanding and analysing various datasets, help us learn on how to tackle with the current issues and business analytics, implement business analytics models and approaches, find business solutions, decisions and conclusions and how we can come up with a solution that could resolve any issue.

The mini business analytics report that I chose is based on managing a financial consumer complaint system. It shows data on consumer grievances over Bank of America's financial services and products from 2017 to 2023. Together with the dates, the complaint was filed with the CFPB and subsequently forwarded to the business, the product and problem the complaint raised, and the business's response back to the consumer.

The dataset that I have chosen to work on has been taken from <https://mavenanalytics.io/data-playground>. The file types are in Excel and csv. There exists a dataset containing 62,516 records and 12 fields. The date on which the data was published on the website of mavenanalytics was on 02/07/2024 by the source - Consumer Financial Protection Bureau and licensed by - Public Domain.

2.Overview of CFPB:

Effective July 21, 2010, the Consumer Financial Protection Bureau (CFPB) was created in accordance with Title X of the Dodd-Frank Wall Street Reform and Consumer Protection Act, Public Law No. 111-203 (Dodd-Frank Act). The CFPB is an Executive agency as defined by Section 105 of Title 5 of the US Code and an independent bureau within the Federal Reserve System.

The CFPB is empowered by the Dodd-Frank Act to use its powers to guarantee that, in relation to consumer financial products and services:

- a) Customers are given access to timely and clear information so they can make informed financial transaction decisions;
- b) The rights of consumers are safeguarded against discriminatory and unfair, dishonest, or abusive behaviours and practices.
- c) Identifying and addressing outdated, superfluous, or excessively burdensome regulations is a common practice to minimize unneeded regulatory burdens;
- d) Fair competition is encouraged by the continuous enforcement of federal consumer financial law;
- e) Access and innovation are facilitated by the effective and transparent operation of consumer financial product and service markets.

The CFPB is headed by a sole Director, appointed by the President, by and with the advice and consent of the Senate, to a five-year term.

3.Exploring the data:

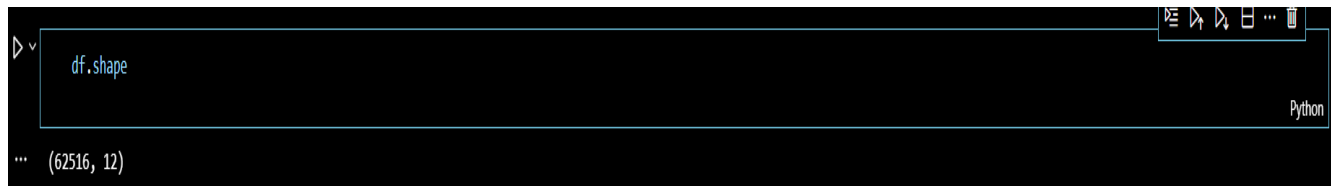
File Home Insert Page Layout Formulas Data Review View Help												
A1 : X ✓ fx Complaint ID												
	A	B	C	D	E	F	G	H	I	J	K	L
1	Complaint ID	Submitted via	Date submitted	Date received	State	Product	Sub-product	Issue	Sub-issue	Company public response	Company response to consumer	Timely response?
2	4848023	Referral	2021-10-24	2021-10-27	NY	Mortgage	Conventional home r	Applying for a mortgage or refinancing an e	Company has responded to	Closed with explanation		Yes
3	3621464	Web	2020-04-24	2020-04-24	FL	Money transfer, virtual c	Refund anticipation c	Lost or stolen check		Company has responded to	Closed with monetary relief	Yes
4	5818349	Web	2022-07-27	2022-07-27	CA	Credit reporting, credit r	Credit reporting	Incorrect informatio	Account information i	Company has responded to	Closed with explanation	Yes
5	7233015	Referral	2023-07-10	2023-07-11	CA	Credit card or prepaid c	General-purpose pre	Problem getting a ca	Trouble getting, activating, or registering a card	In progress		
6	5820224	Referral	2022-07-27	2022-07-28	VA	Credit card or prepaid c	General-purpose cre	Closing your account	Company closed your	Company has responded to	Closed with explanation	Yes
7	6237961	Web	2022-11-23	2022-11-23	CA	Credit card or prepaid c	General-purpose cre	Getting a credit card	Card opened as result	Company has responded to	Closed with explanation	Yes
8	4348292	Web	2021-05-04	2021-05-04	TX	Checking or savings acc	Checking account	Closing an account	Funds not received fro	Company has responded to	Closed with monetary relief	Yes
9	4090544	Web	2021-01-24	2021-01-24	CA	Credit reporting, credit r	Credit reporting	Incorrect informatio	Account status incorre	Company has responded to	Closed with explanation	Yes
10	5337082	Web	2022-03-18	2022-03-18	TX	Credit card or prepaid c	General-purpose cre	Fees or interest	Problem with fees	Company has responded to	Closed with monetary relief	Yes
11	6203657	Web	2022-11-14	2022-11-14	VA	Checking or savings acc	Other banking produ	Closing an account	Funds not received fro	Company has responded to	Closed with explanation	Yes
12	5092497	Web	2022-01-10	2022-01-10	FL	Mortgage	Conventional home r	Applying for a mortgage or refinancing an e	Company has responded to	Closed with explanation		Yes
13	5336959	Web	2022-03-18	2022-03-18	KS	Checking or savings acc	Checking account	Opening an account	Account opened as a r	Company has responded to	Closed with explanation	Yes
14	5618881	Web	2022-05-28	2022-05-28	GA	Checking or savings acc	Checking account	Managing an accoun	Deposits and withdraw	Company has responded to	Closed with explanation	Yes
15	2850455	Web	2018-03-21	2018-03-21	FL	Money transfer, virtual c	International money	Fraud or scam		Company has responded to	Closed with explanation	Yes
16	5618923	Web	2022-05-28	2022-05-28	CA	Checking or savings acc	Checking account	Managing an accoun	Deposits and withdraw	Company has responded to	Closed with explanation	Yes
17	7230934	Web	2023-07-10	2023-07-10	FL	Mortgage	Conventional home r	Applying for a mortgage or refinancing an e	Company has responded to	Closed with explanation		Yes
18	2721761	Web	2017-11-07	2017-11-07	CT	Credit card or prepaid c	General-purpose cre	Advertising and mar	Didn't receive advertis	Company has responded to	Closed with explanation	Yes
19	2784223	Web	2018-01-16	2018-01-16	OH	Vehicle loan or lease	Loan	Getting a loan or lea	Changes in terms mid-	Company has responded to	Closed with explanation	Yes
20	3119597	Referral	2019-01-08	2019-01-08	NJ	Checking or savings acc	Checking account	Managing an accoun	Problem using a debit	Company has responded to	Closed with monetary relief	Yes
21	5819430	Web	2022-07-28	2022-07-28	FL	Credit card or prepaid c	General-purpose cre	Getting a credit card	Card opened as result	Company has responded to	Closed with non-monetary reli	Yes
22	7028167	Web	2023-05-25	2023-05-25	TX	Debt collection	Credit card debt	Took or threatened t	Collected or attemptec	Company has responded to	Closed with monetary relief	Yes
23	5683986	Web	2022-06-18	2022-06-18	IL	Credit reporting, credit r	Credit reporting	Problem with a credi	Problem with persona	Company has responded to	Closed with explanation	Yes

Let's examine the contents of the file named **Consumer_Complaints.xlsx** to determine the kind of structure and organization of the data they include. There are 12 columns and 62,516 entries in the dataset. The columns are summarized as follows:

1. **Complaint ID:** The unique/distinct identifying number associated with the complaint
2. **Submitted via:** How the complaint was filed via web, phone, postal mail, etc to the CFPB
3. **Date submitted:** The date or the day on which the complaint was received by the CFPB
4. **Date received:** The date on which the bank/company received the complaint from the CFPB
5. **State:** U.S. state where the complaint has been originated. There are 50 states in U.S.
6. **Product:** The type of financial product involved that the consumer identified in the complaint

7. Sub-product: The type of sub-product that the customer or consumer mentioned in the complaint (not all items have sub-products)
8. Issue: Overall problems and issues that the customer or consumer faces
9. Sub-issue: More specific details of the issue that the consumer pointed out (Not every issue has a matching sub-issue, and potential values vary depending on the product and issue)
10. Company public response: The optional, publicly visible reaction of the business or company to a customer's grievance. Businesses will be able to choose from a predetermined selection of choices that will be displayed on the public database. As an instance, "Company believes complaint is the result of an isolated error."
11. Company response to consumer: The response back to the consumer by the company or bank/business. For example, "closed with explanation, monetary or non-monetary relief".
12. Timely response?: Whether the bank/business or company responded within the allotted timeframe in Yes or No.

The python code `df.shape` displays the number of rows and columns in the dataset:



The screenshot shows a Jupyter Notebook interface with a dark theme. A code cell contains the text `df.shape`. Below the code cell, the output is displayed as `(62516, 12)`. The notebook's toolbar is visible at the top right, and the word "Python" is in the bottom right corner of the cell area.

```
df.shape
```

```
... (62516, 12)
```

4.The role of technology in complaint resolution:

A successful company/business/bank is built on its ability to handle client concerns. An organized framework is made to record, monitor, address, and evaluate customer or stakeholder complaints. The days of manually processing complaints are long gone. Automation of repetitive chores, process streamlining, and actionable insights are all made possible by modern CMS solutions.

```
df.info()
```

[4] Python

```
... <class 'pandas.core.frame.DataFrame'>
RangeIndex: 62516 entries, 0 to 62515
Data columns (total 12 columns):
#   Column                Non-Null Count  Dtype  
---  -
0   Complaint ID          62516 non-null  int64  
1   Submitted via         62516 non-null  object  
2   Date submitted        62516 non-null  datetime64[ns]
3   Date received         62516 non-null  datetime64[ns]
4   State                 62516 non-null  object  
5   Product               62516 non-null  object  
6   Sub-product           62509 non-null  object  
7   Issue                 62516 non-null  object  
8   Sub-issue             51658 non-null  object  
9   Company public response 60341 non-null  object  
10  Company response to consumer 62516 non-null  object  
11  Timely response?      61022 non-null  object  
dtypes: datetime64[ns](2), int64(1), object(9)
memory usage: 5.7+ MB
```

5.Why do Companies/businesses need complaint management:

The aim to have a complaint management system and analyse the data for financial consumer complaint is an approach on how a company/business/bank uses its power and tools to protect its current consumers of financial services, in line with consumer protection objectives.

This helps in further developing the strategy as the scope and responsibilities change (due to modifications in main and secondary legislation, for instance),

the workplace environment changes, and the difficulties that consumers encounter in their financial lives change.

Every complaint is an opportunity to find problems, fix them, respond back with clarity and explanation and raise client satisfaction levels. Ignoring concerns is not an option in the competitive environment of today. Good complaint handling preserves brand reputation, increases loyalty, and fosters trust.

Here, python code in visual studio has been used to analyse the data. The codes to display the dataset is:

```
# python library imported  
  
import numpy as np  
  
import pandas as pd  
  
import matplotlib.pyplot as plt  
  
import seaborn as sns  
  
#the Excel file Consumer_Complaints.xlsx into a pandas dataframe df  
  
#pd.read_excel() reads the file and displays the first few data  
  
df = pd.read_excel("Consumer_Complaints.xlsx")  
  
df.head()
```


The screenshot shows a Jupyter Notebook with the following code in the first cell:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

The second cell contains the following code:

```
df = pd.read_excel("Consumer_Complaints.xlsx")
df.head()
```

The output of the second cell is a table of consumer complaints:

	Complaint ID	Submitted via	Date submitted	Date received	State	Product	Sub-product	Issue	Sub-issue	Company public response	Company response to consumer	Timely response?
0	4848023	Referral	2021-10-24	2021-10-27	NY	Mortgage	Conventional home mortgage	Applying for a mortgage or refinancing an exis...	NaN	Company has responded to the consumer and the ...	Closed with explanation	Yes
1	3621464	Web	2020-04-24	2020-04-24	FL	Money transfer, virtual currency, or money ser...	Refund anticipation check	Lost or stolen check	NaN	Company has responded to the consumer and the ...	Closed with monetary relief	Yes
2	5818349	Web	2022-07-27	2022-07-27	CA	Credit reporting, credit repair services, or o...	Credit reporting	Incorrect information on your report	Account information incorrect	Company has responded to the consumer and the ...	Closed with explanation	Yes
3	7233015	Referral	2023-07-10	2023-07-11	CA	Credit card or prepaid card	General-purpose prepaid card	Problem getting a card or closing an account	Trouble getting, activating, or registering a ...	NaN	In progress	NaN
4	5820224	Referral	2022-07-27	2022-07-28	VA	Credit card or prepaid card	General-purpose credit card or charge card	Closing your account	Company closed your account	Company has responded to the consumer and the ...	Closed with explanation	Yes

6.Objectives:

The objectives of the analysis are interconnected and helps to contribute in protecting the bank's/company's consumer/customer from any harm. The main operational objectives are as follows:

- Protecting customers: ensuring that customers have a suitable level of protection.
- Protect the financial market: safeguard and improve the integrity of the financial system in the United States of America.
- Promotes Competition: encourage healthy competition for the benefit of customers.

The secondary objective to facilitate the international competitiveness and growth of the US economy of each state.

In order to make a bank or a company work well for consumers, the bank or company need to ensure that they meet the market's interest and target in which firms are competing vigorously for consumers' business, and where consumers

are well-informed and empowered to make decisions, give feedbacks, generate complaints on various issues and concerns, this in turn increases competitive

pressures on companies and businesses, supporting innovation, quality and lower in price.

We are all aware that competition by itself may not always be enough to ensure that markets function effectively and provide the required results for customers. Business analysts should step in as needed to safeguard customers when this occurs.

The requirements, problems, and grievances of various consumer groups vary throughout the financial services industry and evolve throughout the course of their lives. As an analyst, one must make sure that one addresses and analysis the areas of greatest harm and that the work represents the varied demands of the American people.

In addition to the fact that financial products and services can be complex and challenging to comprehend, consumers who make poor decisions may suffer both financial and psychological effects. For customers who exhibit vulnerabilities, this could be more challenging.

Bank, firm, Businesses and enterprises need to be aware of and consider how these issues may affect the requirements and choices of their customers. It is only reasonable to assume that consumers will take accountability for their actions when they have confidence that the items and services they select are tailored to their requirements and that they receive the information and assistance they need to make their decisions.

Addressing information gaps between American banks and consumers regarding financial services is the goal of an analyst. An analyst keeps working with customers so they can defend themselves. Additionally, it establishes unambiguous standards for companies and enterprises. To make sure that markets function properly, an analyst will constantly try to increase customers' awareness of their rights, obligations, and risks.

7.The outcome we want to have:

The results we hope to achieve: -

Analysts must have four broad expectations for financial services that apply to all of the areas and industries that we oversee. We want to observe:

- 1.) Fair value: customers get reasonable costs, high-quality products and services, response to their queries and complaints in time and with valid reasons.
- 2.) Suitability and treatment: customers are given appropriate goods and services and are treated with respect.
- 3.) Consumers' high levels of confidence and market engagement are mostly due to
 - (a) less damage when businesses fail and
 - (b) a decrease in financial crime.
- 4.) Access: (a) strong operational resilience and
 - (b) minimal exclusion are used to satisfy a variety of customer needs.

8.Potential questions for analysis:

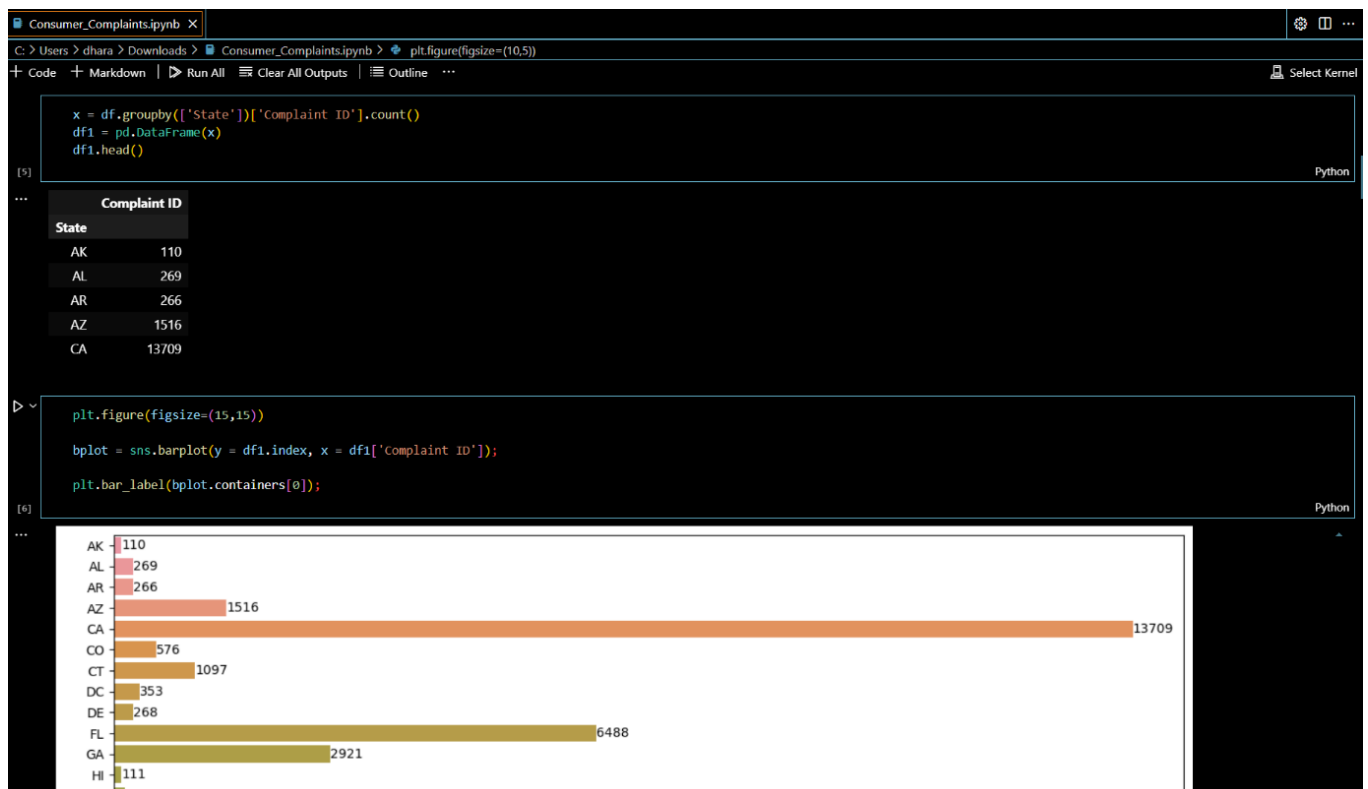
1.How has the quantity of complaints/grievances from the consumer end has changed over different states?

2. What are the states with the most complaints?

```
x = df.groupby(['State'])['Complaint ID'].count()
```

```
df1 = pd.DataFrame(x)
```

```
df1.head()
```



3. Which financial products are the most frequently complained about?

```
x = df.groupby(['Product'])['Complaint ID'].count()
```

```
df2 = pd.D x = df.groupby(['Product'])['Complaint ID'].count()
```

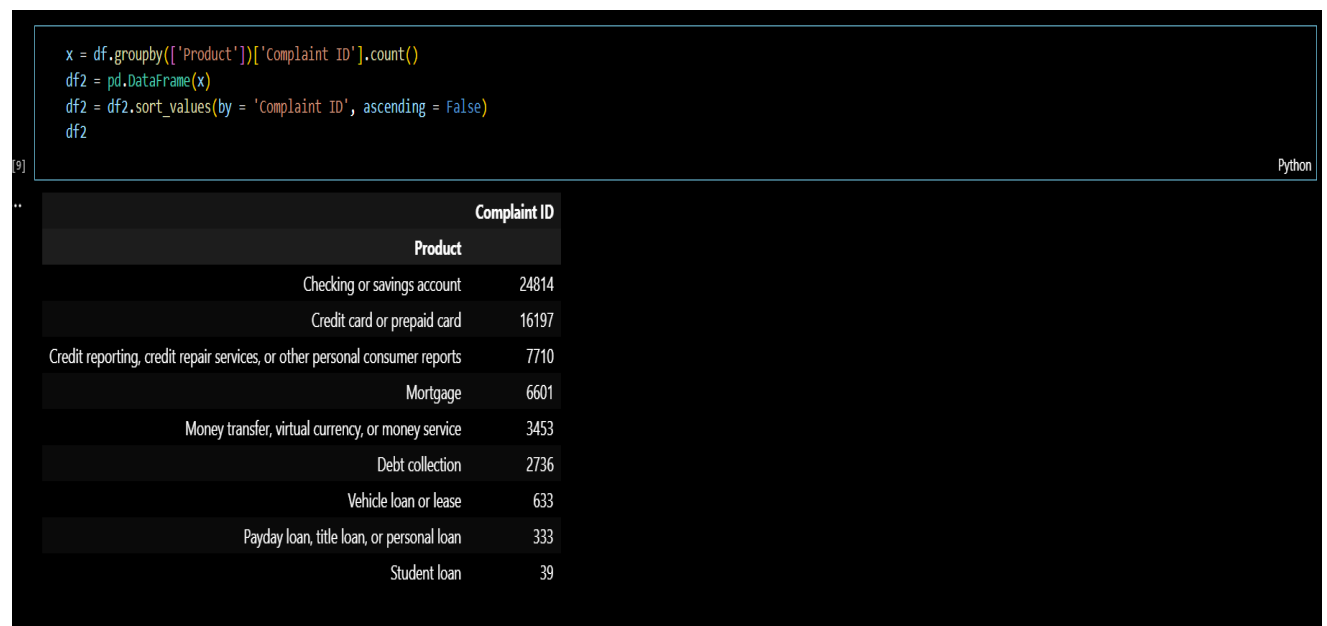
```
df2 = pd.DataFrame(x)
```

```
df2 = df2.sort_values(by = 'Complaint ID', ascending = False)
```

```
df2ataFrame(x)
```

```
df2 = df2.sort_values(by = 'Complaint ID', ascending = False)
```

```
df2
```

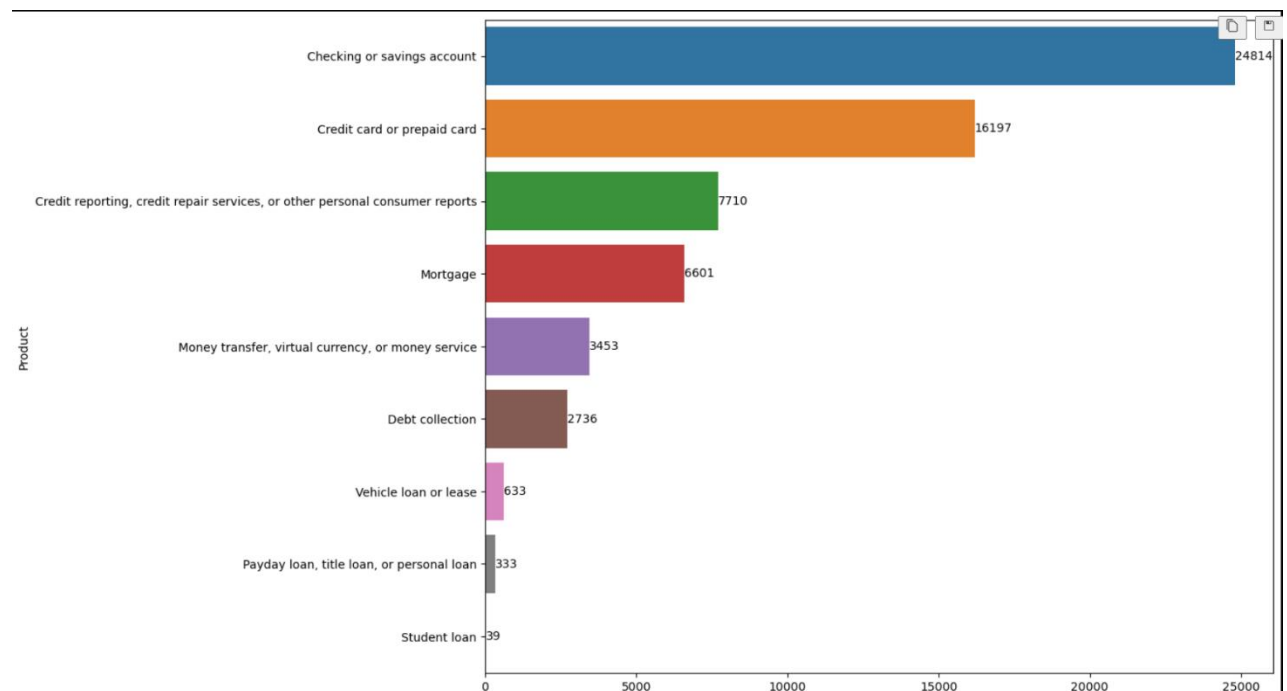


The python code to plot the graph:

```
plt.figure(figsize=(12,10))
```

```
bplot = sns.barplot(y = df2.index, x = df2['Complaint ID']);
```

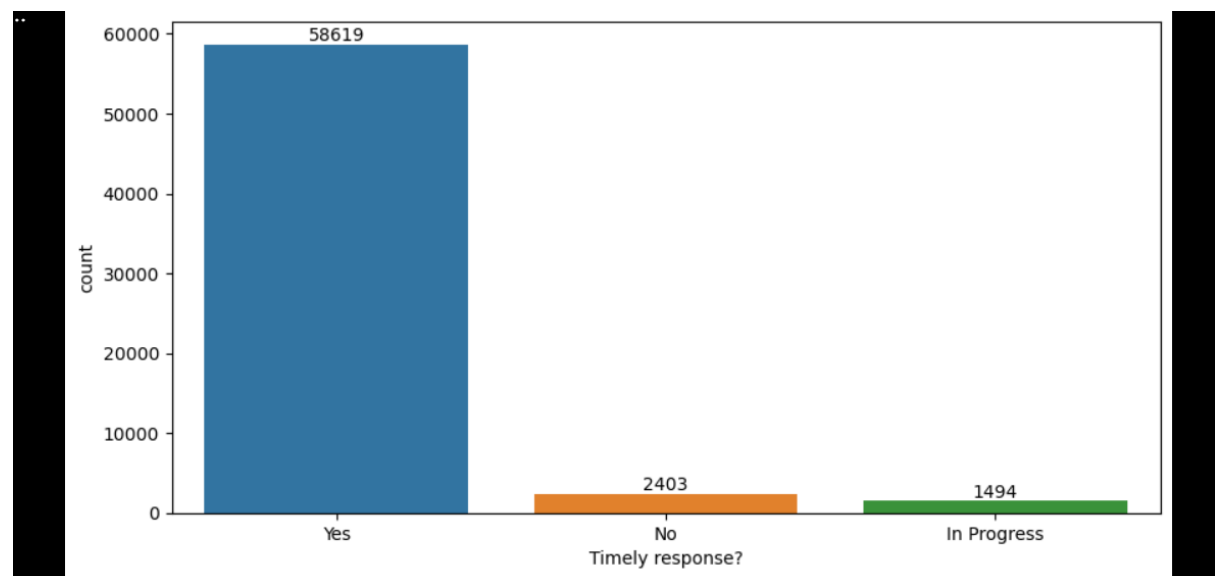
```
plt.bar_label(bplot.containers[0]);
```



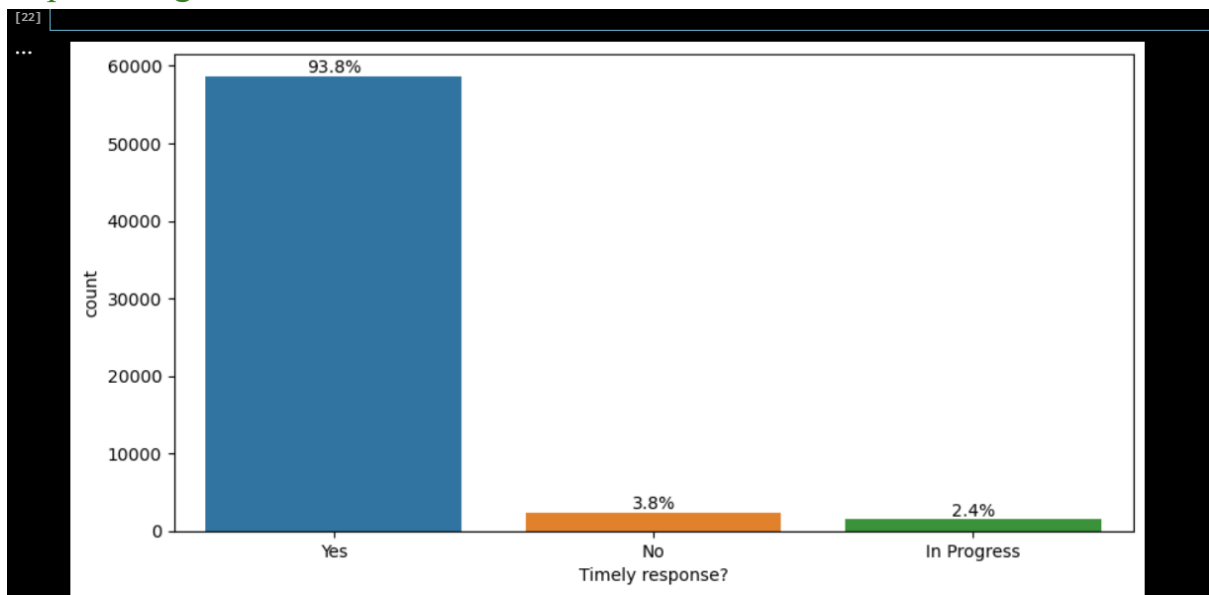
4. What quantity and percentage of complaints are addressed in a "Timely response" manner?

```
> df_new['Timely response?'].value_counts()
..
Yes          58619
No           2403
In Progress   1494
Name: Timely response?, dtype: int64
```

In numbers:



In percentage:



5. How do different concerns differ in the kind of reaction (e.g., monetary relief, non-monetary relief, explanation)?

[24]

```
df['Company response to consumer'].value_counts()
```

...

Closed with explanation	41044
Closed with monetary relief	14697
Closed with non-monetary relief	5273
In progress	1494
Closed	8

Name: Company response to consumer, dtype: int64

Conclusion:

From the given dataset of financial consumer complaint of America's bank that I have chosen from <https://mavenanalytics.io/data-playground>, we can conclude

1. The number of complaints by the consumers through their unique complaint ID
2. We can find the number of responses in count and in percentage value that were given back on time and those that are pending.
3. We can find and analyse the complaints that got resolved with monetary relief.
4. We could find data and create graph on which state of America has majority of complaints lodged
5. Which product has the most complaint by the consumer
6. How the complaint has been resolved

10.Citation:

Consumer Financial Protection Bureau. (2022). Consumer Financial Protection Bureau Strategic Plan FY 2022 - 2026. https://files.consumerfinance.gov/f/documents/cfpb_strategic-plan_fy2022-fy2026.pdf

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Mahawar, S. (2022, April 29). Consumer Protection Act, 2019 - IPLeaders. iPLEaders. <https://blog.ipleaders.in/consumer-protection-act-2019-2/>

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